BOARD OF DIRECTORS
SAN LORENZO VALLEY WATER DISTRICT
AGENDA
February 21, 2019

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, February 21, 2019 at 5:30 p.m.**, SLVWD, 13057 Highway 9, Boulder Creek, CA 95006.

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 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 five (5) 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. LIABILITY CLAIM
Claimant: Terry Vierra
Agency claimed against: San Lorenzo Valley Water District

d. CONFERENCE WITH LEGAL COUNSEL- ANITICIPATED LITIGATION
Government Code Section 54956.9(d)(2)
One Case

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. Roll Call

8. 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).

9. 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 five (5) minutes in length, and individuals may only speak once during Oral Communications.

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

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 agendum.

a. NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION – PUBLIC HEARING
Discussion and possible action by the Board regarding the CEQA Pipeline Project at Lyon and Sequoia pipelines.

b. WATER AVAILABILTY ASSESSMENT FOR SAN LORENZO RIVER WATERSHED CONJUNCTIVE USE PLAN
Discussion and possible action by the Board regarding the Water Availability Assessment for San Lorenzo River Watershed Conjunctive Use Plan.

11. 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. SPECIAL DISTRICT RISK MANAGEMENT AGENCY 2019 ELECTION NOMINATIONS
Discussion and possible action by the Board regarding nominations for the SDRMA Board 2019.

b. SAN LORENZO VALLEY LEAK DETECTION – FINAL REPORT
Discussion and possible action by the Board regarding the final report on Leak Detection.

c. AWARD OF BID FOR LOMPICO PRESSURE RELIEF VALVES.
Discussion and possible action by the Board regarding the Award of Bid for Lompico PRVs.

d. VALLEY GARDENS WILL SERVE LETTER
Discussion and possible action by the Board regarding the Will Serve Letter to Valley Gardens.

e. CLOSED SESSION DOCUMENTS
Discussion and possible action by the Board regarding District practices for closed session documents distributed to a majority of the Board.

f. ENVIRONMENTAL COMMITTEE MEETING SUSPENSION
Discussion and possible action by the Board regarding suspension of Environmental Committee meetings until a public member has been appointed.

g. WATERSHED AND EDUCATION GRANTS SUSPENSION
Discussion and possible action by the Board regarding suspension of the Watershed and Education Grants.

h. 2016 STRATEGIC PLAN REVIEW
Discussion and possible action by the Board regarding a review of the 2016 Strategic Plan.

12. 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 SPECIAL BOARD OF DIRECTORS MEETING JANUARY 23, 2019
Consideration and possible action by the Board to approve minutes from the Special BoD meeting on January 23, 2019.

b. MINUTES FROM BOARD OF DIRECTORS MEETING FEBRUARY 7, 2019
Consideration and possible action by the Board to approve minutes from the February 7, 2019 BoD meeting.

13. District Reports:
No action will be taken and discussion may be limited at the President's discretion. The District encourages that questions be submitted in writing (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
  - Operations
  - Environmental

- COMMITTEE REPORTS
  - Future Committee Agenda Items
  - Committee Meeting Notes/Minutes
    - Environmental Committee Minutes 1.17.19
    - LADOC Minutes 1.29.19

14. Written Communication:
    - Letter from D. Cox
    - Letter from K. Holl, K. Moore, I. Parker and J. Trumbo
    - Claim Form from T. Vierra

15. Informational Material:
    - Notice of Public Meeting - LAFCO

16. Adjournment

Certification of Posting

I hereby certify that on February 15, 2019 I posted a copy of the foregoing agenda in the outside display case at the District Office, 13060 Highway 9, Boulder Creek, California, 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 February 15, 2019.

_____
Holly B. Hossack
District Secretary

MEMO

TO: Board of Directors

FROM: District Manager
PREPARED BY: Environmental Analyst

SUBJECT: Discussion and Possible Action Regarding approving Initial Study for the Lyon and Sequoia Pipeline Projects

DATE: February 21, 2019

RECOMMENDATION

It is recommended that the Board of Directors review this memo and adopt the Mitigated Negative Declaration and Initial Study for the Lyon and Sequoia Pipeline Projects.
To save paper, the Full IS-MND is available on our website was posted in the January 17th agenda and will not be re posted on the current agenda. Please visit:

http://www.slvwd.com/Projects/Loyn%20-%20Sequoia%20NOI/Public%20Review%20Draft%20MND.zip

BACKGROUND

Lyon Zone

Lyon Zone Water Distribution System Project (Lyon Project) consists of replacing the existing 6" water distribution line in the Lyon and Big Steel Zones with approximately 5,600 linear feet of 12-inch ductile iron pipe. The new pipeline will parallel the existing 8" line preferably in the same easement, beginning at the Big Steel, Lyon, and Little Lyon Reservoirs and ending at the intersection of Central Avenue and Lomond Street in Boulder Creek, CA. The current pipeline goes through homeowner yards and under houses, making maintenance a challenge. Past analysis states that if the existing line was upsized, water could flow from Lyon and Big Steel Reservoirs to fill the Reader, Blackstone, and Bear Creek Reservoirs. This will add flexibility to utilize multiple supply sources throughout the District. PRVs will need to be installed. (USDA, 2018)

Sequoia Avenue

The Sequoia Avenue Pipeline Project (Project) will prevent water losses and service outages in the Reader Pressure Zone. The existing 6" cast iron pipe is in extremely poor condition, experiencing two breaks annually which results in major water loss. Several hundred customers' service is interrupted to fix these breaks. The proposed Project consists of the following:

- Remove 800 feet of existing 6" pipe located above ground and supported by aging redwood timbers along Sequoia Avenue.
- Install 800 feet of 8" HDPE water main and appurtenances to replace the existing above ground section of pipeline along Sequoia Avenue. The alignment of the new main will be in the Sequoia Avenue right-of-way (ROW). Surveying is required to

confirm the location of the ROW along the abandoned section of road. The new pipe will be constructed above ground on supports. Construction includes connections to existing service laterals, fire hydrants as requested by the Fire Department or District Standards, and other appurtenances as describe by District standards. (USDA, 2018)

PROJECT LOCATION

The project site is composed of two locations in northwestern Santa Cruz County within the census-designated place of Boulder Creek. The Lyon Pipeline location extends from the Big Steel, Lyon, and Little Lyon Reservoirs along State Route (SR) 236, Pine Street, and Lomond Street, ending at the intersection of Central Avenue and Lomond Street. The Sequoia Avenue Pipeline location extends along Sequoia Avenue from its intersection with Hoot Owl Way. Both pipeline locations are composed of existing roadway rights-of-way (ROW) and utility easements.

UPDATE

January 22, 2019 the Notice of Intent to Adopt a Mitigated Negative Declaration (MND) with copies of the NMD and the board approved Initial Study (Attached) was distributed to the attached distribution list, posted at the project locations and received by the County Clerk. A legal ad was posted in the Sentinel on January 23rd (see attached). The public comment period opened on January 22th and closed February 21st, 2019 to satisfy the 30 days required by CEQA regulations. Following the close of the public comment period, the District will respond to comments (as of the preparation of this memo, no comments have been received). The Mitigation Monitoring Program has been prepared, and a resolution for adoption is attached. If adopted, the MND will be submitted to the county the week of February 25, 2019.

RECOMMENDATION

It is recommended that the Board of Directors Adopt the Mitigated Negative Declaration by resolution for the Lyon and Sequoia pipeline projects.

FISCAL IMPACT: None

2015 STRATEGIC PLAN:
Strategic Element 1.0 – Water Supply Management
Strategic Element 3.0 – Capital Facilities

SAN LORENZO VALLEY WATER DISTRICT

RESOLUTION NO. 29 (18-19)

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE SAN LORENZO VALLEY WATER DISTRICT MAKING CERTAIN FINDINGS AND DETERMINATIONS IN ACCORDANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT FOR IMPLEMENTATION OF THE LYON AND SEQUOIA AVENUE PIPELINES PROJECT, FOR WHICH AN INITIAL STUDY/MITIGATED NEGATIVE DECLARATION WAS PREPARED IN ACCORDANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT; AUTHORIZING THE DISTRICT MANAGER TO PROCEED WITH IMPLEMENTATION OF THE LYON AND SEQUOIA AVENUE PIPELINES PROJECT; ADOPTING A MITIGATION MONITORING AND REPORTING PROGRAM IN CONNECTION THEREWITH; AND DIRECTING THE DISTRICT MANAGER TO FILE A NOTICE OF DETERMINATION WITH THE SANTA CRUZ COUNTY CLERK

WHEREAS, the San Lorenzo Valley Water District ("District") intends to construct the Lyon and Sequoia Avenue Pipelines Project consisting of installation and operation of approximately 6,400 linear feet (LF) of potable water pipelines and appurtenance structures as well as abandonment of an existing pipeline and removal of approximately 800 LF of existing pipeline within two locations. The purpose of the proposed pipelines is to reduce water losses, improve the adequacy and resiliency of the existing water supply system, and reduce routine maintenance and repair impacts to private property and environmentally-sensitive habitat; and

WHEREAS, the California Environmental Quality Act of 1970, as amended ("CEQA") requires that, in the approval of a project for which a mitigated negative declaration has been prepared, the decision-making body shall review the mitigated negative declaration and make certain findings regarding the significant effects on the environment identified in the mitigated negative declaration; and

WHEREAS, such decision-making body in this circumstance is the San Lorenzo Valley Water District Board of Directors; and

WHEREAS, the Lyon and Sequoia Avenue Pipelines Project is the subject of an Initial Study/Mitigated Negative Declaration entitled "Lyon and Sequoia Avenue Pipelines Project Initial Study Mitigated Negative Declaration" ("IS-MND") (SCH #2019012039), prepared by the District as lead agency under CEQA, in connection with implementation of the Lyon and Sequoia Avenue Pipelines Project; and

WHEREAS, the District published a Notice of Intent to adopt an IS-MND in the *Santa Cruz Sentinel* newspaper on January 22, 2019, and the draft MND was circulated to responsible agencies and other parties, including the County of Santa Cruz and the State Clearinghouse and Planning Unit of the Governor's Office of Planning and Research on January 22, 2019; and

WHEREAS, the District did not receive any comments on the draft MND; and

WHEREAS, the MND concluded that implementation of the Lyon and Sequoia Avenue Pipelines Project could result in several potentially significant effects on the environment, and further identified mitigation measures that would reduce any potentially significant effects to a less than significant level; and

WHEREAS, such mitigation measures are set forth in a Mitigation Monitoring and Reporting Program ("MMRP") prepared by the District, as lead agency, together with and as part of the MND; and

WHEREAS, with the incorporation and implementation of measures contained in the MMRP into the Lyon and Sequoia Avenue Pipelines Project, any potentially significant effects on the environment arising from the Lyon and Sequoia Avenue Pipelines Project will be reduced to a less than significant level; and

WHEREAS, the District Board of Directors hereby certifies that it has considered the proposed MND and MMRP and the information contained within, together with comments received thereto; and

WHEREAS, the MND and the MMRP for the Lyon and Sequoia Avenue Pipelines Project is hereby incorporated into this Resolution as if fully set forth herein;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE SAN LORENZO VALLEY WATER DISTRICT AS FOLLOWS:

1. The District Board of Directors makes the following findings: (a) on the basis of the whole record before the Board (including the initial study, the MND together with the MMRP, comments received in connection thereto, and other information in the record), there is no substantial evidence that the Lyon and Sequoia Avenue Pipelines Project will have a significant effect on the environment; (b) the MND together with the MMRP prepared for the Lyon and Sequoia Avenue Pipelines Project have been completed in compliance with CEQA and consistent with State CEQA Guidelines; (c) the Board has independently reviewed and analyzed the MND together with the MMRP, comments received thereto and other information in the record, prior to its approval of the Lyon and Sequoia Avenue Pipelines Project and this Resolution; and (d) the MND together with the MMRP reflects the District's independent judgment and analysis as a lead agency.

2. The Board hereby adopts the MND, together with the mitigation, monitoring and reporting measures contained in the MMRP, prepared for the Lyon and Sequoia Avenue Pipelines Project. The Board further designates the District's Secretary at the District's office, located at 13060 Highway 9, Boulder Creek, California 95006, as the custodian of documents and record of proceedings on which this decision is based.

3. The Board approves the Lyon and Sequoia Avenue Pipelines Project and authorizes the District's District Manager to proceed with implementation of the Lyon and Sequoia Avenue Pipelines Project.

4. The Board authorizes and directs the District Manager to file a Notice of Determination with the office of the Santa Cruz County Clerk in accordance with the provisions of CEQA.

5. The foregoing recitals are true and correct and incorporated herein as if fully set forth.

PASSED, APPROVED AND ADOPTED this 21st day of February, 2019, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

_____
Lois Henry, President

ATTEST:

_____
Holly Hossack, District Secretary

Lyon and Sequoia Avenue Pipelines Project

Mitigation Monitoring and Reporting Program

San Lorenzo Valley Water District
13060 CA-9
Boulder Creek, California 95006

February 2019

Overview

CEQA requires that a reporting or monitoring program be adopted for the conditions of project approval that are necessary to mitigate or avoid significant effects on the environment (Public Resources Code 21081.6). The Mitigation Monitoring and Reporting Program (MMRP) is designed to ensure compliance with adopted mitigation measures during project implementation. For each applicable mitigation measure recommended in this Initial Study – Mitigated Negative Declaration, specifications are made herein that identify the action required and the monitoring that must occur. In addition, a responsible party is identified for verifying compliance with individual conditions of approval contained in the Mitigation Monitoring and Reporting Program.

To implement this MMRP, the San Lorenzo Valley Water District (SLVWD) shall designate a Project Mitigation Monitoring and Reporting Coordinator ("Coordinator"). The coordinator shall be responsible for ensuring that the mitigation measures incorporated into the project are complied with during project implementation.

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
BIOLOGICAL RESOURCES							
BIO-1 Worker Environmental Awareness Program (WEAP). Prior to initiation of construction activities (including staging and mobilization), all personnel associated with project construction shall attend WEAP training, conducted by a qualified biologist, to aid workers in recognizing special status resources that may occur in the project area. The specifics of this program shall include identification of the sensitive species and habitats, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information shall also be prepared for distribution to all contractors, their employees, and other personnel involved with construction of the projects. All employees shall sign a form provided by the trainer documenting they have attended the WEAP and understand the information presented to them. The form shall be submitted to SLVWD to document compliance.	Review factsheet to confirm information requirements are met. Confirm fact sheet availability/distribution. Verify that all personnel associated with project construction activities in Environmentally Sensitive Areas.	Prior to start of construction. During construction period as new workers visit the site, or when construction involves a new areas with different species considerations.	Once. Periodically.	San Lorenzo Valley Water District			
BIO-2 Preconstruction Nesting Raptor and Bird Surveys and Avoidance. To avoid impacts to nesting bird species and raptors, all initial ground-disturbing activities and tree removal should be limited to the time period between September 15 and February 1. If initial ground-disturbing activities and tree removal cannot be limited to this time period, the project contractor shall complete a pre-construction survey to determine if active nests are within the project area limits, or sufficiently close to project activity to be disturbed by construction activities. Surveys shall be conducted by a qualified biologist. Construction activity shall be scheduled so that no	Verify that a qualified biologist has performed a nesting bird pre-construction survey; review results submitted by biologist. If active bird nests are located during the pre-construction survey, qualified biologist establishes appropriates buffer zones and monitor nests	Prior to start of construction (within 14 days), if during nesting season. Not required outside nesting season. During construction, based on conditions.	Once. Periodically.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
more than fourteen (14) days elapse between the pre-construction survey and the commencement of any activity that would potentially disturb trees or shrubs in the nesting zone. The pre-construction survey should determine if birds are breeding and/or nesting in the construction zone or within 300 feet (500 feet for raptors) of the construction zone. Pre-construction nesting bird and raptor surveys shall be conducted during the time of day when birds are active and shall be of sufficient duration to reliably conclude presence/absence of nesting birds and raptors on site and within the designated vicinity. If no nests are found, no further action is required. If nests are found, an avoidance buffer will be established by the qualified biologist. The size of the buffer shall be based upon the species, presence of screening vegetation, the proposed work activity, ambient levels of human activity, and existing disturbances associated with land uses outside of the site to ensure the nesting activity is not disrupted. The avoidance buffer shall be demarcated by the biologist with bright orange construction fencing, flagging, construction lathe, or other means to mark the boundary until the adults and young are no longer reliant on the nest site. The qualified biologist shall monitor construction activities that occur near active nest areas to ensure that no inadvertent adverse impacts affect the nest.							
BIO-3 Preconstruction Surveys for Woodrat and Relocation/Avoidance. Prior to vegetation clearing within woodland areas of the project sites, a qualified biologist shall conduct a preconstruction survey for San Francisco dusky-footed woodrat middens. If no middens are found that would be damaged or destroyed by project activity, or that occur within 25 feet of proposed project activity, no further action would be required. If woodrat middens are found that would be damaged by	Verify that a qualified biologist has conducted pre-construction surveys for San Francisco dusky-footed woodrat middens; dismantled any middens that would be damaged by project activity, marked and established a buffer for remaining middens within 25 feet of project.	Prior to start of construction.	Once.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
project activity, the qualified biologist shall dismantle middens by hand allowing any occupying woodrats to escape unharmed. Middens within 25 feet of proposed project activity shall be demarcated with a 25-foot avoidance buffer to ensure the midden is not inadvertently damaged during construction activity.							
BIO-4 Preconstruction Amphibian Surveys and Avoidance. The following procedures shall be implemented to ensure that impacts to listed and non-listed amphibian species are less than significant. • Prior to start of project activities, a qualified biologist should conduct a "tailgate" education session to familiarize all personnel conducting project activities with the identification and life-history of listed and non-listed amphibian species. • Ground disturbance would not begin until written approval is received from the United States Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) that project biologist(s) are qualified to conduct the work.	Verify that a qualified biologist has conducted an amphibian education session for all personnel. Verify that written approval has been received from the USFWS and CDFW for qualified biologist(s).	Prior to start of construction. Prior to start of construction and upon staffing changes.	Once. Once, and as needed.	San Lorenzo Valley Water District			
• If feasible, initial ground disturbing activities should be conducted between May 1 and October 31 during dry weather conditions to minimize the potential for encountering listed and non-listed amphibian species. Work should be restricted to daylight hours. • A qualified biologist should conduct a survey of the project site within 48 hours of initial ground disturbing activities. The survey area should include the proposed disturbance area and all proposed ingress/egress routes, plus a 100-foot buffer. If any life stage of CRLF is found within the survey area, the USFWS should be consulted to determine the appropriate course of action. If any life stage of FYLF is found within the survey area,	Verify that no work is happening during non- daylight hours. Verify that a qualified biologist has conducts a CRLF and FYLF pre-construction survey; and review results. if presence, consult with USFW or CDFW respectively for guidance.	During construction. Prior to initial ground disturbance.	Periodically. Once.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
the CDFW should be consulted to determine the appropriate course of action.							
• Biological monitoring is required under the following conditions: o A biological monitor shall be present for all construction activity in naturally vegetated areas no matter the time of year (applies to the naturally vegetated areas of the Sequoia and Lyon pipelines). o During the rainy season (November 1 through April 30), a biological monitor shall be present for all construction activity in paved areas that are located adjacent to a creek, river or drainage where there is potential for CRLF or FYLF to occur during dispersal events. This would include the following locations: o The portion of the Lyon Pipeline project between Hazel Avenue and the northwest end of the project alignment at the tank.	Verify that a qualified biologist is on-site to monitor construction activity as indicated in the mitigation measure.	During construction.	Periodically.	San Lorenzo Valley Water District			
• If construction must occur between November 1 and April 30, the qualified biologist should conduct a pre-activity clearance sweep prior to start of project activities within 48 hours after any rain events of 0.1 inch or greater or if wet conditions are present on site. The clearance survey would allow any frog, if found on-site, to leave of its own volition before any construction activities would begin. No relocation of frogs would occur without written authorization of the USFWS and/or CDFW, or by any individuals not specifically authorized by the USFWS for handling of CRLF or from CDFW for handling FYLF. • SLVWD or its contractor would cover dirt or sand piles left overnight with tarps or plastic to prevent CRLF/FYLF from sheltering in the material. All	Verify that a qualified biologist conducts pre-activity clearance sweeps. Verify that dirt and sand are being covered to preclude amphibians. Very that a qualified biologist is on-site to inspects holes and trenches.	Within 48 hours of rain or wet conditions. During construction. During construction.	Periodically when conditions warrant. Periodically. Periodically.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
holes and trenches would be inspected each morning by a biological monitor.							
• Vegetation disturbance should be the minimum necessary to achieve the goals of the project. • In case of vegetation disturbance, project sites would be re-vegetated with an assemblage of native riparian, wetland, and upland vegetation suitable for the area. Locally collected plant materials would be used to the extent practicable. Invasive, exotic plants would be controlled to the maximum extent practicable. This measure would be implemented in all areas disturbed by activities associated with the project, unless the USFWS and SLVWD determine that it is not practical. • To control sedimentation during and after project implementation, SLVWD would implement best management practices outlined in any authorizations or permits issued under the authorities of the Clean Water Act that it receives for the specific project. If best management practices are ineffective, the project proponent would attempt to remedy the situation immediately, in coordination with the USFWS or CDFW as applicable. • Unless approved by the USFWS and/or CDFW, water would not be impounded in the course of project activities in a manner that may attract CRLF or FYLF. • If a work site is to be temporarily dewatered by pumping, intakes would be completely screened with mesh not larger than 0.2 inch to prevent CRLF/FYLF from entering the pump system. Water would be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any diversions or barriers	Verify that vegetation disturbance is being minimized, re-vegetation is occurring, and control invasive or exotic plants controls are being implemented. Verify that erosion-control best management practices are being implemented. Verify that no water is being impounded on site. Screen dewatering intakes as indicated. Release water downstream to maintain flows during construction. Remove diversions or barriers to water flow as indicated.	During and post-construction. During and post-construction. During and post-construction. During construction.	Periodically. Periodically. Periodically. On-going.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
to flow would be removed in a manner that would allow flow to resume with the least disturbance to the substrate.							
• Alteration of the stream bed would be minimized to the maximum extent possible; any imported material would be removed from the stream bed upon completion of the project. • All trash should be removed from the site daily and disposed of properly to avoid attracting potential predators to the site. • No pets should be permitted on-site during project activities. • All vehicles should be in good working condition and free of leaks. All leaks should be contained and cleaned up immediately to reduce the potential of soil/vegetation contamination. • All refueling, maintenance, and staging of equipment and vehicles should occur at least 100 feet from riparian habitat or water bodies and in a location from where a spill would not drain directly toward aquatic habitat (e.g., on a slope that drains away from the water).	Verify that streambed alteration is minimized, and that excess imported material is removed. Verify that the site is free of trash and removed. Verify that no pets are on-site. Verify that vehicles are free of leaks, and that spills/leaks are cleaned up and reported. Verify that refueling, maintenance and staging areas are at least 100 free from riparian habitat/water bodies.	During and post-construction. At all times. At all times. At all times. At all times.	Periodically. Periodically. Periodically. Periodically. Periodically.	San Lorenzo Valley Water District			
• The number of access routes, size of staging areas, and the total area of the activity should be limited to the minimum necessary to achieve the project goals. • To ensure that diseases are not conveyed between work sites by the qualified biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force should be followed at all times. • No herbicide should be use on-site. • A County-approved biologist shall be present on site during initial ground disturbance. If any life stage of CRLF or FYLF is found, work shall cease within 100 feet of the CRLF or FYLF and the USFWS (for CRLF) or CDFW (for FYLF) shall be	Verify that routes, staging, and activity disturbance areas have been minimized. Verify that *Declining Amphibian Populations Task Force* protocols are being followed. Verify that no herbicides are being used. Very that a County-approved biologist is on-site during initial ground disturbance.	At all times. At all times. At all times. Prior to construction.	Periodically. Periodically. Periodically. Once.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
contacted immediately to determine the appropriate course of action.							
GEOLOGY AND SOILS							
GEO-1 Erosion Control Plan. The project contractor shall prepare and implement an Erosion Control Plan for construction activities to minimize soil erosion. The Erosion Control Plan shall contain BMPs that include the following components: • Excavation shall be limited to the dry season of the year (i.e., April 15 to November 1). • Exposed soils shall be watered twice daily to prevent wind erosion. • Silt fencing, straw bales composed of rice straw (that are certified to be free of weed seed), fiber rolls, gravel bags, mulching erosion control blankets, soil stabilizers, and storm drain filters shall be used, in conjunction with other methods, to prevent erosion throughout the entire project site and siltation of stream channels and detention basins. • Temporary berms and sediment basins shall be constructed to avoid unnecessary siltation into local waterways during construction activities. • Erosion controls that protect and stabilize stockpiles and exposed soils shall be used to prevent movement of materials. Potential erosion control devices include plastic sheeting held down with rocks or sandbags over stockpiles, silt fences, or berms of hay bales. • Temporary stockpiling of excavated material shall be minimized. However, excavated material shall be stockpiled in areas where it cannot enter the waterways along the Lyon Pipeline location. Available stockpiling sites at or near the project site shall be determined prior to the start of construction. • Frequency of sediment removal from detention basins, location of spoil disposal, locations and types of erosion and sediment control structures,	Verify that the Erosion Control Plan addresses the BMPs detailed in the mitigation. Field verify that standard BMPs are in place during construction activities.	Prior to approval of grading plans. Field verify during construction activities.	Once. Periodically.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
and materials that would be used on-site during construction activities shall be specified. • Upon completion of project construction, all exposed soils present in and around the project site shall be stabilized within seven days. Exposed soils shall be mulched to prevent sediment runoff and transport. All mulches, except hydro-mulch, shall be applied in a layer not less than two inches deep. Where feasible, all mulches shall be kneaded or tracked-in with track marks parallel to the contour, and tackified as necessary to prevent excessive movement. All exposed soils and fills shall be revegetated with deep-rooted, native, drought-tolerant species to minimize slope failure and erosion potential. Geotextile binding fabrics shall be used if necessary to hold slope soils until vegetation is established. • An adequate supply of erosion control materials (gravel, straw bales, shovels, etc.) shall be maintained on-site to facilitate a quick response to unanticipated storm events or emergencies.							
HAZARDS AND HAZARDOUS MATERIALS							
HAZ-1 Prevention of Fire Hazards. During construction of the project, staging areas, welding areas, and areas designated for construction shall be cleared of dried vegetation and other materials that could ignite. Construction equipment with spark arrestors shall be maintained in good working order. In addition, construction crews shall have a spotter during welding activities to minimize potentially dangerous situations, such as accidental sparks. Other construction equipment, including those with hot vehicle catalytic converters, shall be kept in good working order and used only within cleared construction areas. The creation and maintenance of approved fire access roads to work areas shall be required in accordance with applicable fire regulations. During construction of the project, contractors shall	Verify that these fire prevention measures are included as a note on all contractor's specifications. Field verify compliance with these measures.	Prior to issuance of contractor's specifications. During construction.	Once. Periodically.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
require vehicles and crews to have access to functional fire extinguishers.							
HYDROLOGY AND WATER QUALITY							
HWQ-1 Stormwater Pollution Prevention. • Storm water runoff and nuisance flow drainage shall be directed away from riparian habitat and into a temporary stormwater filter constructed to remove pollutants before being allowed to discharge into riparian areas. • The collection and disposal of any and all pollutants originating from construction equipment shall be identified. During construction activities, washing of concrete, paint, or equipment shall occur only in designated areas greater than 100 feet from riparian areas where polluted water and materials can be contained for subsequent removal from the site. Washing shall not be allowed within 100 feet of riparian areas. Plastic shall be placed over any ground surface where fueling or equipment maintenance is to occur. Drip pans shall be placed under equipment parked on-site. • Temporary storage of construction equipment shall be limited to a minimum of 100 feet away from Foreman Creek, the unnamed ephemeral stream, and Boulder Creek.	Verify that these stormwater pollution prevention measures are included in contractor's specifications. Field verify compliance with these measures.	Prior to issuance of contractor's specifications. During construction.	Once. Periodically.	San Lorenzo Valley Water District			
NOISE							
N-1 Construction Noise Mitigation. To reduce noise during construction, the contractor shall implement the following noise control measures: • Construction Hours Limits. Construction shall be limited to Monday through Friday from 8:00 a.m. to 6:00 p.m., and Saturday from 9:00 a.m. to 6:00 p.m. No noise-generating work shall occur on Sundays or federal holidays.	Verify that construction noise mitigation measures are included in contractor's specifications. Field verify compliance with measures.	Prior to issuance of contractor's specifications. During construction.	Once. Periodically.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
• Construction Staging Areas and Stationary Equipment Locations. The contractor shall select equipment staging areas and stationary noise-generating construction equipment locations as far as practicable from sensitive receptors. • Equipment Maintenance. All contractors, as a condition of contract, shall be required to maintain and tune-up all construction equipment to minimize noise emissions. • Idling Prohibition and Enforcement. Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would mean turning off equipment if it would not be used for five or more minutes. Stationary Equipment Shielding. Stationary equipment areas with appropriate acoustic shielding shall be designated on building and grading plans. Equipment and shielding shall be installed prior to construction and remain in designated location throughout construction activities. Pneumatic impact tools and equipment used at the construction site shall have intake and exhaust • mufflers recommended by the manufacturers. Impact noise producing equipment (i.e., jackhammers and pavement breaker[s]) shall be equipped with noise attenuating shields, shrouds, or portable barriers or enclosures to reduce operating noise. • Mufflers. All diesel equipment shall be operated with closed engine doors and shall be equipped with properly operating and maintained residential grade mufflers. • Electrically-Powered Tools and Facilities. Whenever feasible, electrical power shall be used to run air compressors and similar power tools rather than diesel equipment. • Temporary Sound Barriers. When construction is occurring within 50 feet of the nearest residential property line, temporary sound barriers shall be							

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
erected along the boundaries of the project site between active on-site construction work using heavy equipment and adjacent sensitive receptors (residential parcels). Such barriers shall be of sufficient height (approximately 6 feet) to break the line-of-sight between noise-generating equipment and the noise-sensitive receptor, and shall be continuous with no gaps or holes between panels or the ground. Temporary sound barriers may include noise curtains, sound blankets, or solid temporary barriers. • Pre-Construction Notification. Prior to construction, written notification that identifies the type, duration, and frequency of construction activities shall be provided to residents within 100 feet of the Lyon and Sequoia Avenue Pipeline locations.							
N-2 Use of Non-Vibratory or Pneumatic Tired Rollers. Construction activities shall use non-vibratory smooth wheel rollers or pneumatic tired rollers instead of vibratory rollers in order to reduce potentially significant groundborne vibration impacts on residences near the Lyon and Sequoia Avenue Pipeline locations.	Verify that non-vibratory or pneumatic rollers are included in contractor's specifications. Field verify compliance with measure.	Prior to issuance of contractor's specifications. During construction.	Once. Periodically.	San Lorenzo Valley Water District			
TRANSPORTATION/TRAFFIC							
T-1 Traffic Control Plan. Prior to construction or the issuance of applicable permits, the contractor shall submit a Traffic Control Plan to SLVWD, the County of Santa Cruz, and any other agency with jurisdiction over roadways affected by project construction for review and approval. This plan shall: • Describe the proposed lane closures, detours, staging areas, and routes of construction vehicles, including the timing and duration of anticipated closures. • Describe traffic control measures that will be implemented to manage traffic and reduce potential traffic impacts in accordance with	Review and approve Traffic Control Plan from contractor. Field verify traffic control implementation.	Prior to issuance of applicable approvals. During construction.	Once. Periodically.	San Lorenzo Valley Water District			

Mitigation Measure/Condition of Approval	Action Required	Timing	Monitoring Frequency	Responsible Agency or Party	Initial	Date	Comments
stipulations of the most recent version of the California Manual of Uniform Traffic Control Devices. Traffic control measures may include, but are not limited to, flag persons, warning signs, lights, barricades and cones to provide safe passage of vehicles (including cars and buses) and bicycle and pedestrian traffic. • Demonstrate the location of bicycle routes and transit stops and routes, including that of Santa Cruz Metropolitan Transit District Line 35, that will be temporarily impacted by construction activities. Recommend places to temporarily relocate bicycle routes and transit stops and routes, if necessary. • Require written notification of the timing, location, and duration of construction activities, and the location of lane closures or detours (if any) to all emergency service providers (fire and police) prior to road closure. Emergency service vehicles shall be given priority for access.							

Notice of Determination

Appendix D

To:

☐ Office of Planning and Research

U.S. Mail:	*Street Address:*
P.O. Box 3044	1400 Tenth St., Rm 113
Sacramento, CA 95812-3044	Sacramento, CA 95814

☐ County Clerk
County of: _____
Address: _____

From:
Public Agency: San Lorenzo Valley Water District
Address: 13060 CA-9
Boulder Creek, CA 95006
Contact: Jen Michelsen, Env. Prog. Mgr
Phone: (831) 430-4627

Lead Agency (if different from above):
_____
Address: _____
_____
Contact: _____
Phone: _____

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2019012039

Project Title: Lyon and Sequoia Avenue Pipelines Project

Project Applicant: San Lorenzo Valley Water District

Project Location (include county): Highway 9/Big Basin Way/Sequoia Ave, Santa Cruz County

Project Description:
Installation and operation of 6,400 LF of potable water pipelines and appurtenance structures and abandonment of existing pipeline and removal of 800 LF of existing pipeline within two locations. Lyon Pipeline (April - July 2020) extends from the Big Steel, Lyon, and Little Lyon Reservoirs along SR 236, Pine Street, and Lomond Street, ending at the Central Avenue/Lomond Street intersection. Sequoia Avenue Pipeline (July 2021) extends along Sequoia Avenue from its intersection with Hoot Owl Way. Lyon Pipeline construction would entail conventional, open trench construction. Sequoia Avenue construction would entail aboveground pipeline installation on supports.

This is to advise that the San Lorenzo Valley Water District has approved the above
(☒ Lead Agency or ☐ Responsible Agency)

described project on February 21, 2019 and has made the following determinations regarding the above
(date)
described project.

1. The project [☐ will ☒ will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☒ was not] adopted for this project.
6. Findings [☐ were ☒ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:

San Lorenzo Valley Water District, 13060 CA-9, Boulder Creek, CA 95006

Signature (Public Agency): _____ Title: _____

Date: _____ Date Received for filing at OPR: _____

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2011

SAN LORENZO VALLEY WATER DISTRICT
13060 Highway 9 • Boulder Creek, CA 95006-9119
Office (831) 338-2153 • Fax (831) 338-7986
Website: www.slvwd.com

January 18, 2019

Santa Cruz County Public Works Dept.
John Presleigh, Director
701 Ocean St., Room 410
Santa Cruz, CA 95060

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

SAN LORENZO VALLEY WATER DISTRICT
13060 Highway 9
Boulder Creek, California 95006

NOTICE IS HEREBY GIVEN that the San Lorenzo Valley Water District (SLVWD and Lead Agency) has prepared a Draft Initial Study & Mitigated Negative Declaration (IS-MND) for the project listed below pursuant to the California Environmental Quality Act (CEQA) State Guidelines §15000 et seq. Anyone desiring to comment on the IS/MND may do so in writing within the 30-day public review period commencing January 22 through February 21, 2019.

Project Title: Lyon and Sequoia Avenue Pipelines Project

Project Location: Census designated place of Boulder Creek in northwestern Santa Cruz County

Brief Project Description: The project would include installation and operation of approximately 6,400 linear feet (LF) of potable water pipelines and appurtenance structures as well as abandonment of an existing pipeline and removal of approximately 800 LF of existing pipeline within two locations. The Lyon Pipeline location extends from the Big Steel, Lyon, and Little Lyon Reservoirs along State Route (SR) 236, Pine Street, and Lomond Street, ending at the intersection of Central Avenue and Lomond Street. The Sequoia Avenue Pipeline location extends along Sequoia Avenue from its intersection with Hoot Owl Way. The Lyon Pipeline would be constructed from April 2020 through July 2020, and the Sequoia Avenue Pipeline would be constructed in July 2021. Construction of the Lyon Pipeline would entail conventional, open trench construction while construction of the Sequoia Avenue would entail aboveground pipeline installation on supports. Construction would occur within existing utility easements and roadway rights-of-way. The proposed pipelines would reduce water losses, improve the adequacy and resiliency of the existing water supply system, and reduce routine maintenance and repair impacts to private property and environmentally-sensitive habitat. Refer to Figure 1, Project Location and Jurisdictional Boundaries, for a depiction of the proposed project alignments in relation to city and county boundaries. The project corridors are not included on any lists of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

Public Meeting: The SLVWD Board of Directors will consider the project at a Board of Directors meeting held at 6:00 PM on February 21, 2019, at 13057 CA-9, Boulder Creek, California 95006.

30-Day Document Review: The document is available for review during normal business hours at SLVWD's office located at 13060 Highway 9, Boulder Creek, California 95006. The documents may also be found online at: www.slvwd.com.

Contact Person: Written comments may be submitted to:

Jen Michelsen, Environmental Programs Manager
San Lorenzo Valley Water District
13060 Highway 9, Boulder Creek, California 95006.
Email: Jmichelsen@slvwd.com

Figure 1 Lyon Pipeline Location

Imagery provided by Google and its licensors © 2018.

ISMNDFig 2 Lyons Pipeline Project

Figure 2 **Sequoia Avenue Pipeline Location**

Imagery provided by Google and its licensors © 2018.

ISMND Fig 3 Sequoia Pipeline Project

Santa Cruz Sentinel
324 Encinal Street
Santa Cruz, CA 95060
831-429-2415
scslegals@santacruzsentinel.com

2042206

SLV WATER DISTRICT
13060 HIGHWAY 9
BOULDER CREEK, CA 95006-9119

Agenda: 2.21.19
Item: 10a

Proof of Publication
(2015.5 C.C.P.)

STATE OF CALIFORNIA

SS.

COUNTY OF SANTA CRUZ

Public Notice

I, the undersigned, declare:

That I am over the age of eighteen and not interested in the herein-referenced matter; that I am now, and at all times embraced in the publication herein mentioned was, a principal employee of the printer of the Santa Cruz Sentinel, a daily newspaper printed, published and circulated in the said county and adjudged a, newspaper of general circulation by the Superior Court of California in and for the County of Santa Cruz, under Proceeding No. 25794; that the advertisement (of which the annexed is a true printed copy) was published in the above-named newspaper on the following dates, to wit:

01/23/2019

I declare under penalty of perjury that, the foregoing is tru and correct to the best of my knowledge.

This 23th day of January, 2019 at Santa Cruz, California.

Signature

Legal No. **0006284453**

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

NOTICE IS HEREBY GIVEN that the San Lorenzo Valley Water District (SLVWD and Lead Agency) has prepared a Draft Initial Study & Mitigated Negative Declaration (IS-MND) for the project listed below pursuant to the California Environmental Quality Act (CEQA) State Guidelines §15000 et seq. Anyone desiring to comment on the IS/MND may do so in writing within the 30-day public review period commencing January 22 through February 21, 2019.

Project Title: Lyon and Sequoia Avenue Pipelines Project

Project Location: Census designated place of Boulder Creek in northwestern Santa Cruz County

Project Description: The project would include installation and operation of approximately 6,400 linear feet (LF) of potable water pipelines and appurtenance structures as well as abandonment of an existing pipeline and removal of approximately 800 LF of existing pipeline within two locations. The Lyon Pipeline location extends from the Big Steel, Lyon, and Little Lyon Reservoirs along State Route (SR) 236, Pine Street, and Lomond Street, ending at the intersection of Central Avenue and Lomond Street. The Sequoia Avenue Pipeline location extends along Sequoia Avenue from its intersection with Hoot Owl Way. The Lyon Pipeline would be constructed from April 2020 through July 2020, and the Sequoia Avenue Pipeline would be constructed in July 2021. Construction of the Lyon Pipeline would entail conventional, open trench construction while construction of the Sequoia Avenue would entail aboveground pipeline installation on supports. Construction would occur within existing utility easements and roadway rights-of-way. The proposed pipelines would reduce water losses, improve the adequacy and resiliency of the existing water supply system, and reduce routine maintenance and repair impacts to private property and environmentally-sensitive habitat. Refer to Figure 1, Project Location and Jurisdictional Boundaries, for a depiction of the proposed project alignments in relation to city and county boundaries. The project corridors are not included on any lists of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

The public comment period is open from January 22nd, 2019 through February 21st, 2019

Public Meeting: The SLVWD Board of Directors will consider the project at a Board of Directors meeting held at 6:00 PM on February 21, 2019, at 13057 CA-9, Boulder Creek, California 95006.
30-Day Document Review: The document is available for review during normal business hours at SLVWD's office located at 13060 Highway 9, Boulder Creek, California 95006. The documents may also be found online at: www.slvwd.com.
Please submit comments to BOD@SLVWD.COM

Contact Person: Written comments or questions may be submitted to:

Jen Michelsen,
Environmental Programs Manager
San Lorenzo Valley Water District
13060 Highway 9, Boulder Creek, California 95006.

1/23/2019 6284453

SAN LORENZO VALLEY WATER DISTRICT
13060 Highway 9 • Boulder Creek, CA 95006-9119
Office (831) 338-2153 • Fax (831) 338-7986
Website: www.slvwd.com

Received
CLERK OF THE BOARD
JAN 22 2019
BOARD OF SUPERVISORS
COUNTY OF SANTA CRUZ

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

SAN LORENZO VALLEY WATER DISTRICT
13060 Highway 9
Boulder Creek, California 95006

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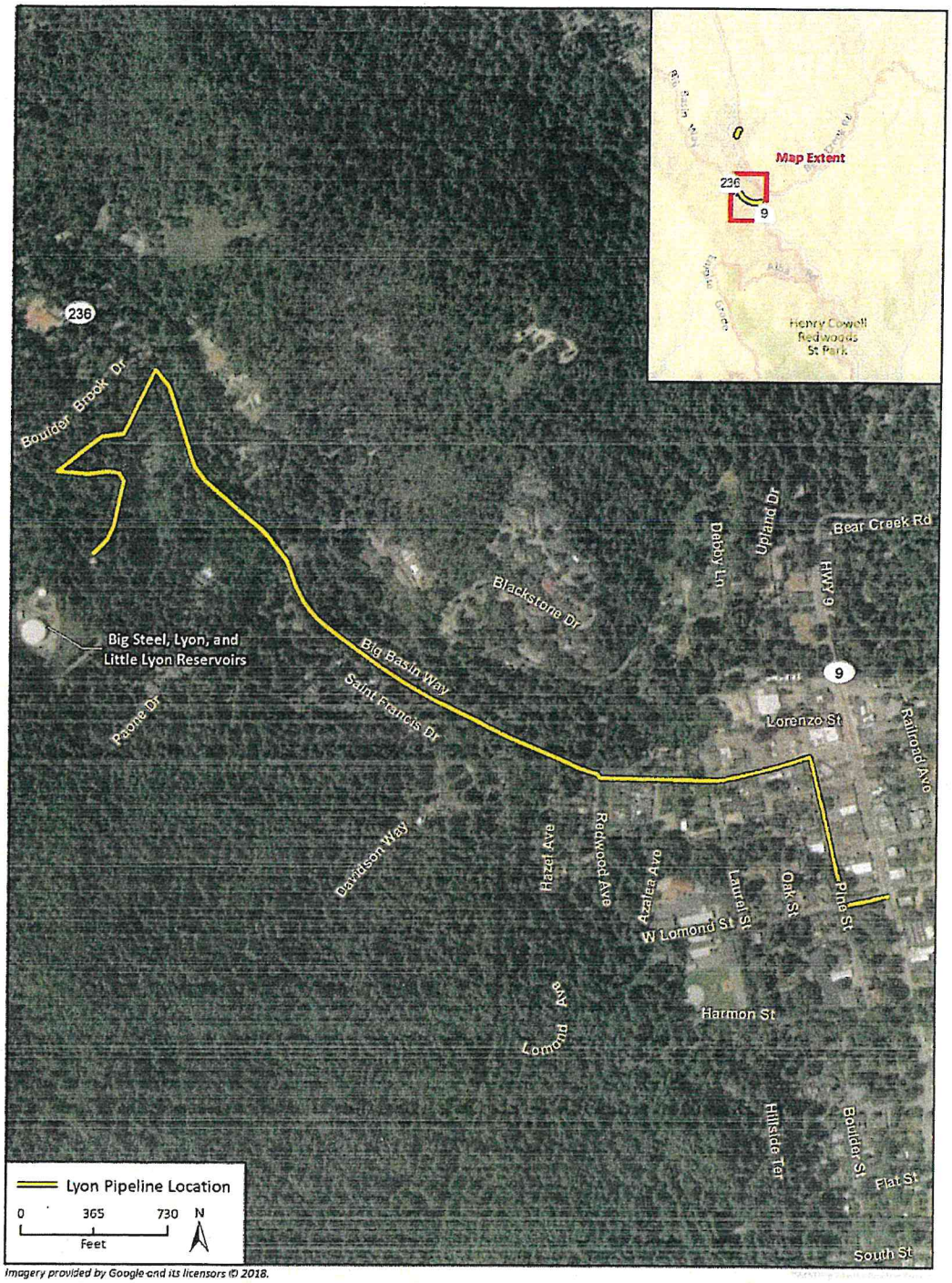
Contact Person: Written comments may be submitted to:
Jim Michelsen, Environmental Programs Manager
San Lorenzo Valley Water District
13060 Highway 9, Boulder Creek, California 95006.
Email: Jmichelsen@slvwd.com

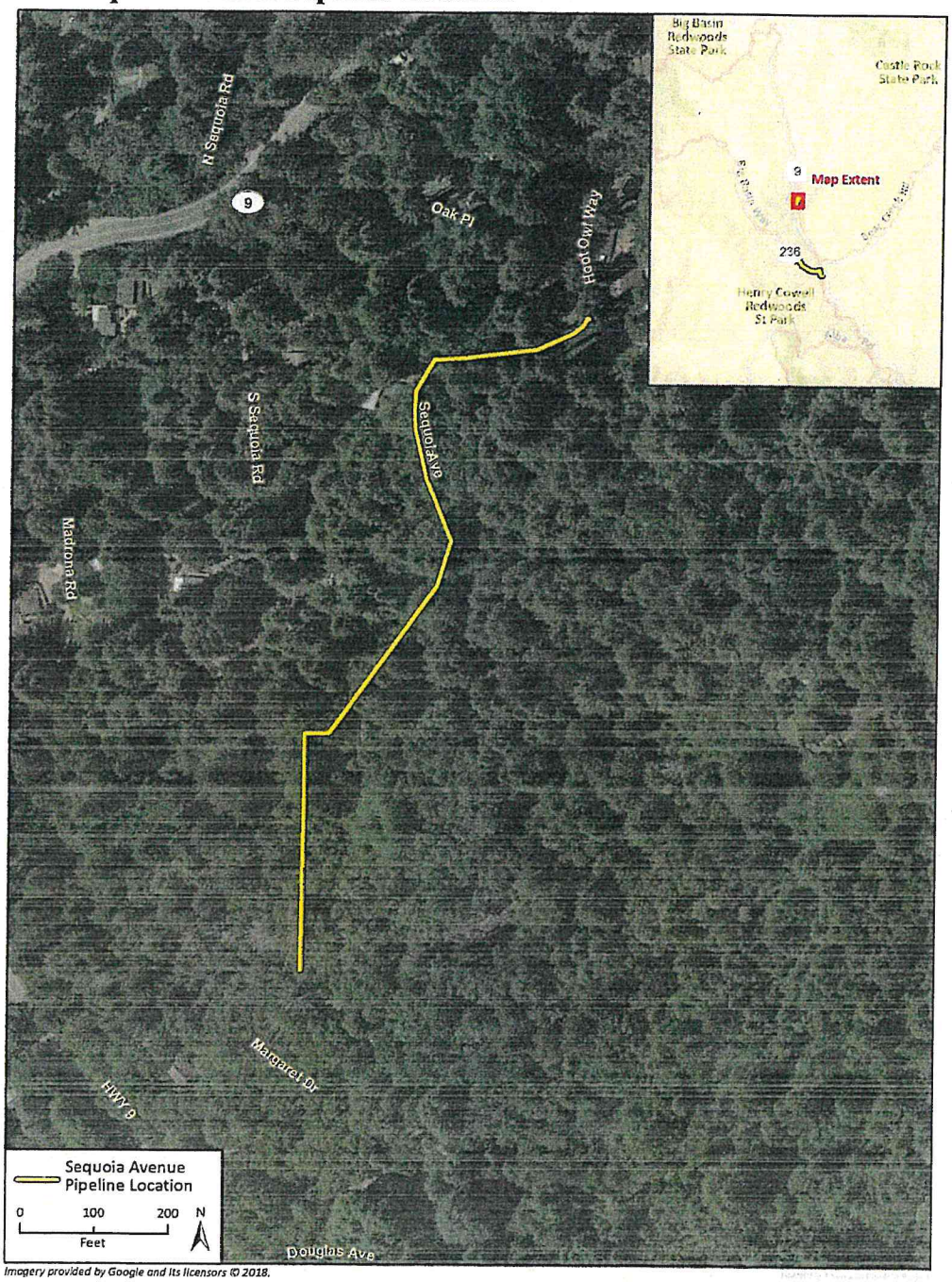
THIS NOTICE HAS BEEN POSTED AT THE CLERK OF THE BOARD OF SUPERVISORS OFFICE FOR A PERIOD COMMENCING Jan 22 2019 AND ENDING Feb 22 2019

Figure 1 **Lyon Pipeline Location**



Imagery provided by Google and its licensors © 2018.

Figure 2 **Sequoia Avenue Pipeline Location**



Imagery provided by Google and its licensors © 2018.

NOI posted on big basin Hwy near Redwood Dr.

NOI Posted Big Basin Hwy in between Paone Dr. & Hazel Ave. (site 1)

NOI posted on sequoia Ave near Hoot Owl Way:

NOI Posted at Highway 9 in between Margaret Dr. & Hoot Owl Way (site 2).

MND/Initial Study DISTRIBUTION LIST FOR
SLVWD Swim Tank Replacement Project

15 copies to State Clearinghouse via FedEx/overnight delivery for first morning delivery:
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

Mail NOI and MND-IS to:

AMBAG
P.O. Box 2453
Seaside, CA 93955

5th District Supervisor,
Bruce McPherson
SC County Board of Supervisors
701 Ocean Street, Room 500
Santa Cruz, CA 95060

Santa Cruz County
Environmental Health Department
701 Ocean St., Rm. 312
Santa Cruz, CA 95060

Santa Cruz County Planning Dept.
Kathy Previsich, Director
701 Ocean Street, 4th Floor
Santa Cruz, CA 95060

Santa Public Works Dept.
John Presleigh, Director
701 Ocean Street, Room 410
Santa Cruz, CA 95060

Mail in advance or deliver NOI on day public review period starts to :

County Clerk NOI ONLY
c/o Clerk of the Board
701 Ocean Street, Room 500
Santa Cruz, CA 95060

Mail NOI only to:

Contiguous land owners:

Neighboring address along both pipelines who received NOI:

13915 W PARK AVE	BOULDER CREEK, CA 95006-9304
125 FOREST ST	BOULDER CREEK, CA 95006-8900
13080 HWY 9	BOULDER CREEK, CA 95006-9119
13111 PINE ST	BOULDER CREEK, CA 95006-8901
13101 HWY 9	BOULDER CREEK, CA 95006-9120
13121 PINE ST	BOULDER CREEK, CA 95006-8901
13117 HWY 9	BOULDER CREEK, CA 95006-9120
13125 HWY 9	BOULDER CREEK, CA 95006-9120
13110 HWY 9	BOULDER CREEK, CA 95006-9120
13127 HWY 9	BOULDER CREEK, CA 95006-9120
13131 PINE ST	BOULDER CREEK, CA 95006-8901
13133 CENTRAL AVE	BOULDER CREEK, CA 95006-9120
13118 HWY 9	BOULDER CREEK, CA 95006-9120
13145 PINE ST	BOULDER CREEK, CA 95006-8901
13141 HWY 9	BOULDER CREEK, CA 95006-9120
13151 PINE ST	BOULDER CREEK, CA 95006-8901
13151 HWY 9	BOULDER CREEK, CA 95006-9120
13155 PINE ST	BOULDER CREEK, CA 95006-8901
13172 LAUREL ST	BOULDER CREEK, CA 95006
13159 HWY 9	BOULDER CREEK, CA 95006-9120
13181 LAUREL ST	BOULDER CREEK, CA 95006-8904
13165 PINE ST	BOULDER CREEK, CA 95006-8901
13395 BIG BASIN WAY	BOULDER CREEK, CA 95006-9237
13401 BIG BASIN WAY	BOULDER CREEK, CA 95006-9236
13415 BIG BASIN WAY	BOULDER CREEK, CA 95006
13191 REDWOOD AVE	BOULDER CREEK, CA 95006-9248
13301 BIG BASIN WAY	BOULDER CREEK, CA 95006-9238
13159 HWY 9	BOULDER CREEK, CA 95006-9120
13265 HWY 236	BOULDER CREEK, CA 95006-9239
13475 BIG BASIN WAY	BOULDER CREEK, CA 95006-9233
13185 PINE ST	BOULDER CREEK, CA 95006-8901
13211 BIG BASIN WAY	BOULDER CREEK, CA 95006-9249
395 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9288
13270 BIG BASIN WAY	BOULDER CREEK, CA 95006-9239
13382 BIG BASIN WAY	BOULDER CREEK, CA 95006-9237
13366 BIG BASIN WAY	BOULDER CREEK, CA 95006-9237
375 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9288
13352 BIG BASIN WAY	BOULDER CREEK, CA 95006-9237
13444 BIG BASIN WAY	BOULDER CREEK, CA 95006-9236

13400 BIG BASIN WAY	BOULDER CREEK, CA 95006-9236
13350 BIG BASIN WAY	BOULDER CREEK, CA 95006-9237
13300 BIG BASIN WAY	BOULDER CREEK, CA 95006-9238
365 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9288
0 BIG BASIN WAY	BOULDER CREEK, CA 95006-9239
13225 HWY 9	BOULDER CREEK, CA 95006-9125

345 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9288

13420 BIG BASIN WAY	BOULDER CREEK, CA 95006-9236
335 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9288
315 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9288
305 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9288
13550 BIG BASIN WAY	BOULDER CREEK, CA 95006-9259
13592 BIG BASIN WAY	BOULDER CREEK, CA 95006

275 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9229
13594 BIG BASIN WAY	BOULDER CREEK, CA 95006-9273
261 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9229
13616 BIG BASIN WAY	BOULDER CREEK, CA 95006-9260
13640 BIG BASIN WAY	BOULDER CREEK, CA 95006-9260
245 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9229
223 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9229
13652 BIG BASIN WAY	BOULDER CREEK, CA 95006-9261
13676 BIG BASIN WAY	BOULDER CREEK, CA 95006-9232
217 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9229
13680 BIG BASIN WAY	BOULDER CREEK, CA 95006-9232
365 MADRONE DR	BOULDER CREEK, CA 95006
195 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9293
175 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9293

165 SAINT FRANCIS DR	BOULDER CREEK, CA 95006-9293
13760 BIG BASIN WAY	BOULDER CREEK, CA 95006-9232

121 PAONE DR	BOULDER CREEK, CA 95006-9228
13816 BIG BASIN WAY	BOULDER CREEK, CA 95006-9227
13816 BIG BASIN WAY	BOULDER CREEK, CA 95006-9227
100 PAONE DR	BOULDER CREEK, CA 95006-9228
13840 BIG BASIN WAY	BOULDER CREEK, CA 95006-9227
13850 BIG BASIN WAY	BOULDER CREEK, CA 95006-9227
13910 BIG BASIN WAY	BOULDER CREEK, CA 95006-9227
350 MADRONE DR	BOULDER CREEK, CA 95006-9296

151 REDWOOD DR	BOULDER CREEK, CA 95006-9055

4 REDWOOD DR	BOULDER CREEK, CA 95006-9226
14100 BIG BASIN WAY	BOULDER CREEK, CA 95006-9224
14000 BIG BASIN WAY	BOULDER CREEK, CA 95006-9257
234 MADRONA RD #1	BOULDER CREEK, CA 95006-8703
15030 HWY 9	BOULDER CREEK, CA 95006-9734
1150 BLUE RIDGE DR #T	BOULDER CREEK, CA 95006-9658
240 MADRONA RD	BOULDER CREEK, CA 95006-8703
370 PLUMERIA CT	BOULDER CREEK, CA 95006-8716
290 HOOT OWL WAY	BOULDER CREEK, CA 95006-8725
345 HOOT OWL WAY	BOULDER CREEK, CA 95006-8721
265 MADRONE DR	BOULDER CREEK, CA 95006-9295
191 REDWOOD DR	BOULDER CREEK, CA 95006-8546
175 REDWOOD DR	BOULDER CREEK, CA 95006-8546

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Lyon and Sequoia Avenue Pipelines Project

Lead Agency: San Lorenzo Valley Water District
Contact Person: Jen Michelsen, Env. Prog. Mgr
Mailing Address: 13060 CA-9
Phone: (831) 430-4627
City: Boulder Creek
Zip: 95006
County: Santa Cruz County

Project Location: County: Santa Cruz County
City/Nearest Community: Boulder Creek
Cross Streets: Highway 9/Big Basin Way/Sequoia Ave
Zip Code: 90746
Longitude/Latitude (degrees, minutes and seconds): 37 ° 34 ′ 30 ″ N / 122 ° 45 ′ 51 ″ W
Total Acres: 0.8
Assessor's Parcel No.: multiple
Section: ____ Twp.: ____ Range: ____ Base: ____
Within 2 Miles: State Hwy #: 9
Waterways: Boulder Creek, Foreman Creek
Airports: ____
Railways: ____
Schools: Little People's School

Document Type:

CEQA:
- ☐ NOP
- ☐ Early Cons
- ☐ Neg Dec
- ☒ Mit Neg Dec
- ☐ Draft EIR
- ☐ Supplement/Subsequent EIR (Prior SCH No.) ____
- Other: ____

NEPA:
- ☐ NOI
- ☐ EA
- ☐ Draft EIS
- ☐ FONSI

Other:
- ☐ Joint Document
- ☐ Final Document
- ☐ Other: ____

Local Action Type:

- ☐ General Plan Update
- ☐ General Plan Amendment
- ☐ General Plan Element
- ☐ Community Plan
- ☐ Specific Plan
- ☐ Master Plan
- ☐ Planned Unit Development
- ☐ Site Plan
- ☐ Rezone
- ☐ Prezone
- ☐ Use Permit
- ☐ Land Division (Subdivision, etc.)
- ☐ Annexation
- ☐ Redevelopment
- ☐ Coastal Permit
- ☒ Other: pipeline approval

Development Type:

- ☐ Residential: Units ____ Acres ____
- ☐ Office: Sq.ft. ____ Acres ____ Employees ____
- ☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
- ☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
- ☐ Educational: ____
- ☐ Recreational: ____
- ☐ Water Facilities: Type ____ MGD ____
- ☐ Transportation: Type ____
- ☐ Mining: Mineral ____
- ☐ Power: Type ____ MW ____
- ☐ Waste Treatment: Type ____ MGD ____
- ☐ Hazardous Waste: Type ____
- ☒ Other: Water Pipeline

Project Issues Discussed in Document:

- ☒ Aesthetic/Visual
- ☒ Agricultural Land
- ☒ Air Quality
- ☒ Archeological/Historical
- ☒ Biological Resources
- ☐ Coastal Zone
- ☒ Drainage/Absorption
- ☐ Economic/Jobs
- ☐ Fiscal
- ☒ Flood Plain/Flooding
- ☒ Forest Land/Fire Hazard
- ☒ Geologic/Seismic
- ☒ Minerals
- ☒ Noise
- ☒ Population/Housing Balance
- ☒ Public Services/Facilities
- ☒ Recreation/Parks
- ☒ Schools/Universities
- ☒ Septic Systems
- ☐ Sewer Capacity
- ☒ Soil Erosion/Compaction/Grading
- ☒ Solid Waste
- ☒ Toxic/Hazardous
- ☒ Traffic/Circulation
- ☒ Vegetation
- ☒ Water Quality
- ☒ Water Supply/Groundwater
- ☒ Wetland/Riparian
- ☒ Growth Inducement
- ☒ Land Use
- ☒ Cumulative Effects
- ☐ Other: ____

Present Land Use/Zoning/General Plan Designation:

Resource Conservation/Rural Residential/Suburban Residential/Community Commercial/Mountain Residential

Project Description: *(please use a separate page if necessary)*

Installation and operation of 6,400 LF of potable water pipelines and appurtenance structures and abandonment of existing pipeline and removal of 800 LF of existing pipeline within two locations. Lyon Pipeline extends from the Big Steel, Lyon, and Little Lyon Reservoirs along SR236, Pine Street, and Lomond Street, ending at the Central Avenue/Lomond Street intersection. Sequoia Avenue Pipeline extends along Sequoia Avenue from its intersection with Hoot Owl Way. Lyon Pipeline would be constructed from April 2020 through July 2020. Sequoia Avenue Pipeline would be constructed in July 2021. Lyon Pipeline construction would entail conventional, open trench construction. Sequoia Avenue construction would entail aboveground pipeline installation on supports. Construction would occur within existing utility easements and roadway ROW.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

____	Air Resources Board	X	Office of Historic Preservation
____	Boating & Waterways, Department of	____	Office of Public School Construction
____	California Emergency Management Agency	____	Parks & Recreation, Department of
X	California Highway Patrol	____	Pesticide Regulation, Department of
X	Caltrans District #5	X	Public Utilities Commission
____	Caltrans Division of Aeronautics	X	Regional WQCB #3
____	Caltrans Planning	____	Resources Agency
____	Central Valley Flood Protection Board	____	Resources Recycling and Recovery, Department of
____	Coachella Valley Mtns. Conservancy	____	S.F. Bay Conservation & Development Comm.
____	Coastal Commission	____	San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
____	Colorado River Board	____	San Joaquin River Conservancy
____	Conservation, Department of	____	Santa Monica Mtns. Conservancy
____	Corrections, Department of	____	State Lands Commission
____	Delta Protection Commission	____	SWRCB: Clean Water Grants
____	Education, Department of	X	SWRCB: Water Quality
____	Energy Commission	____	SWRCB: Water Rights
X	Fish & Game Region #3	____	Tahoe Regional Planning Agency
____	Food & Agriculture, Department of	____	Toxic Substances Control, Department of
X	Forestry and Fire Protection, Department of	X	Water Resources, Department of
____	General Services, Department of		
____	Health Services, Department of	____	Other: ____
____	Housing & Community Development	____	Other: ____
X	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date January 22, 2019 Ending Date February 20, 2019

Lead Agency (Complete if applicable):

Consulting Firm: ____	Applicant: ____
Address: ____	Address: ____
City/State/Zip: ____	City/State/Zip: ____
Contact: ____	Phone: ____
Phone: ____	

Signature of Lead Agency Representative: ____ **Date:** 1/18/19

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

MEMO

TO: Board of Directors

FROM: District Manager
PREPARED BY: Environmental Programs Manager

SUBJECT: Discussion and Possible Action to Review and Accept the Final Water Availability Assessment for a Conjunctive Use Plan for the San Lorenzo Valley Water District

DATE: February 21, 2019

RECOMMENDATION:
It is recommend that the Board of Directors review and accept the Water Availability Assessment for a Conjunctive Use Plan.

BACKGROUND

On March 15, 2018 your Board approved a contract with Exponent for a Water Availability Assessment for a Conjunctive Use Plan for the San Lorenzo Valley Water District.

The San Lorenzo Valley Water District (SLVWD) and the County of Santa Cruz received California state grant funds to develop a conjunctive use plan to improve aquatic habitat and water-supply reliability within the San Lorenzo River watershed. As part of the plan's development, this water availability assessment identifies options for increasing water-supply reliability and dry-period streamflows through the conjunctive use of available surface water and groundwater resources.

SLVWD operates three water systems: the North system supplied by both stream diversions and pumped groundwater; the South system supplied solely by groundwater; and the Felton system supplied solely by stream and spring diversions. The neighboring Scotts Valley Water District (SVWD) and Mount Hermon Association (MHA) rely solely on groundwater. Each system produces water in response to relatively immediate water demand and all groundwater is produced from within the Santa Margarita Groundwater Basin (SMGB).

Increasing the conjunctive use of groundwater and surface water supplies within the San Lorenzo River watershed has the potential to improve water rights compliance, instream flows, and groundwater storage. The potential for increased conjunctive use is

supported by the occurrence of divertible streamflows exceeding local demand, the recent construction of system interties, and SLVWD's mostly unused annual allotment of Loch Lomond Reservoir storage.

This report presents alternatives for optimizing the conjunctive use of current and potential water sources using existing and potential infrastructure to improve aquatic habitat and water-supply reliability within the San Lorenzo River watershed. For each alternative, Exponent performed an analysis of monthly water supply, water production, and projected 2045 water demand over the 48- year climatic cycle spanning water years (WY) 1970-2017. The approach requires estimates of monthly streamflows and potential diversions based on estimated frequencies of mean daily flow adjusted for month and hydrologic year-type (e.g., wet, dry, etc.). Alternative conjunctive-use scenarios are compared to a base case calibrated to SLVWD's proportional use of surface-water and groundwater during WYs 2000-2017.

The Grant has fund $330,000 for this effort. SLVWD has agreed to provide $285,000 in match through completed and planned activities. Additional costs, up to $15,000 to be paid by SLVWD are included in the match.

It is recommend that the Board of Directors review and accept the Water Availability Assessment for a Conjunctive Use Plan.

2015 STRATEGIC PLAN:
Strategic Element 1.0 – Water Supply Management
Strategic Element 2.0 – Watershed Stewardship

FISCAL IMPACT:
Department: 01 – Administration
Account: 5020, Contract/Professional Services
Cost: $60,000 grant funded
Up to $15,000 District funded

Exponent®

Water Availability Assessment for San Lorenzo River Watershed Conjunctive Use Plan

Exponent®

Water Availability Assessment for San Lorenzo River Watershed Conjunctive Use Plan

Prepared for

San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, CA 95006

Prepared by

Exponent
475 14th Street, Suite 400
Oakland, CA 64612

January 30, 2019

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QAID: 1801115.000 - 4511

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Figures appear following each section's text and tables.

Acronyms and Abbreviations

% avg	percent of average
% dfa	percent departure from average
ac	acre
af	acre-feet
afm	acre-feet per month
afy	acre-feet per year
ASR	aquifer storage and recovery
avg	average
cfs	cubic feet per second
cfs/mi^2	cubic feet per second per square mile
ck	creek
CY	calendar year (January–December)
dfa	departure from average
ft	feet
ft bgs	feet below ground surface
ft msl	feet above mean sea level
gpm	gallons per minute
gpd	gallons per day
hp	horsepower
in	inches
in/yr	inches per year
max	maximum
MHA	Mount Hermon Association
mi	mile
mi^2	square miles
min	minimum
mgd	million gallons per day
mgy	million gallons per year
mth	month
Oly-#	Olympia well
Paso-#	Pasatiempo well
QH-#	Quail Hollow well
SCCWD	Santa Cruz City Water Department
SGMA	Sustainable Groundwater Management Act
SLR	San Lorenzo River
SLRBT	San Lorenzo River at Big Trees (USGS gauging station)
SLVWD	San Lorenzo Valley Water District
SMGB	Santa Margarita Groundwater Basin
sp	spring
SVWD	Scotts Valley Water District
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
WAC	Water Systems Consulting

WTP	water treatment plant
WY	water year (e.g., WY 2018 was October 1, 2017, to September 30, 2018)

Conversion Factors

1 af	=	43,560	ft^3	=	325,851	gal	=	0.326	mg
1 afm	=	0.0166	cfs	=	7.434	gpm	=	0.0107	mgd
1 afy	=	0.00138	cfs	=	0.620	gpm	=	892.1	gd
1 cfs	=	448.8	gpm	=	0.646	mgd	=	724.5	afy
1 gpm	=	1,440	gpd	=	0.526	mgy	=	1.6141	afy
1 mgd	=	1.547	cfs	=	694.4	gpm	=	1,121	afy

Limitations

The results of this study are suitable for a planning-level evaluation of conjunctive use alternatives. The synthesized monthly records of water supply and use have limited precision and should not be used to evaluate compliance with specific regulatory, water-right, or habitat requirements. The alternatives are evaluated under optimal, hypothetical conditions without full regard for infrastructure and operational limitations, and as such likely overestimate potential yields. The actual yield of existing and future infrastructure will depend on numerous factors beyond the scope of this analysis.

The approach used to evaluate and compare conjunctive use alternatives does not consider the effects of stream diversions or groundwater pumping other than by San Lorenzo Valley Water District (SLVWD). Beyond the simplified approach used for this study, evaluating the effects of groundwater pumping on streamflow requires use of a calibrated numerical groundwater flow model, which was outside the scope of this study. The conjunctive use alternatives are evaluated and compared on the basis of the 1970-2017 climatic period without considering potential climate change.

The report provides additional details about the methods, results, and limitations of this study.

Executive Summary

The San Lorenzo Valley Water District (SLVWD) and the County of Santa Cruz received California state grant funds to develop a conjunctive use plan to improve aquatic habitat and water-supply reliability within the San Lorenzo River watershed. As part of the plan's development, this water availability assessment identifies options for increasing water-supply reliability and dry-period streamflows through the conjunctive use of available surface water and groundwater resources.

SLVWD operates three water systems: the North system supplied by both stream diversions and pumped groundwater; the South system supplied solely by groundwater; and the Felton system supplied solely by stream and spring diversions. The neighboring Scotts Valley Water District (SVWD) and Mount Hermon Association (MHA) rely solely on groundwater. Each system produces water in response to relatively immediate water demand and all groundwater is produced from within the Santa Margarita Groundwater Basin (SMGB).

Increasing the conjunctive use of groundwater and surface water supplies within the San Lorenzo River watershed has the potential to improve water rights compliance, instream flows, and groundwater storage. The potential for increased conjunctive use is supported by the occurrence of divertible streamflows exceeding local demand, the recent construction of system interties, and SLVWD's mostly unused annual allotment of Loch Lomond Reservoir storage.

This report presents alternatives for optimizing the conjunctive use of current and potential water sources using existing and potential infrastructure to improve aquatic habitat and water-supply reliability within the San Lorenzo River watershed. For each alternative, Exponent performed an analysis of monthly water supply, water production, and projected 2045 water demand over the 48-year climatic cycle spanning water years (WY) 1970-2017. The approach requires estimates of monthly streamflows and potential diversions based on estimated frequencies of mean daily flow adjusted for month and hydrologic year-type (e.g., wet, dry, etc.). Alternative conjunctive-use scenarios are compared to a base case calibrated to SLVWD's proportional use of surface-water and groundwater during WYs 2000-2017.

In addition to a simulated base case, a total of 22 conjunctive-use alternatives are evaluated, grouped as follows:

Scenario 1 – Optimizes the use of current sources assuming existing or modified infrastructure.

Scenario 2 – Adds use of SLVWD's allotment of Loch Lomond Reservoir storage, which substitutes for unpermitted diversions and groundwater pumping, contributing to groundwater storage recovery through in-lieu recharge.

Scenario 3 – Increases the yield of the Olympia wellfield in the North System through operating an aquifer storage and recovery (ASR) project supplied by available surface water in excess of monthly water demand.

Scenario 4 – Provides the remaining available surface water to the Scotts Valley area for use as in-lieu recharge (i.e., used as a substitute for groundwater pumping, contributes to groundwater storage recovery).

Each alternative consists of four parts: (1) a model of monthly water demand, (2) synthetic records of monthly unimpaired flows and potentially divertible flows, (3) estimates of sustainable groundwater yield, including estimated yield reductions during drought and heavy demand; and (4) a monthly accounting of demand and supply for an assumed set of production capacities and an assumed prioritized use of individual surface water and groundwater sources.

The evaluation of each alternative includes estimating (a) percent reductions in unimpaired flow downstream of simulated diversions and impaired flow downstream in Boulder Creek and the San Lorenzo River; and (b) percent reductions in drought minimum stream baseflow down gradient of simulated wells. The estimated reductions in flow are plotted and reported as percentages of streamflow remaining. These results reflect the influence of SLVWD stream diversions and SLVWD, SVWD, and MHA groundwater pumping only.

The results are suitable for a planning-level evaluation of conjunctive-use alternatives. The scenarios are simulated under optimal, hypothetical conditions without full regard for infrastructure and other operational limitations, and as such likely overestimate potential yields. The actual yield of modified infrastructure will depend on numerous factors beyond the scope of this analysis. The presented values of simulated monthly flow have limited precision and should not be used to evaluate compliance with specific regulatory, water-right, or habitat requirements. Evaluating the effects of groundwater pumping on streamflow, beyond the approach used for this study, will

require use of a calibrated numerical groundwater flow model, which was not within the scope of this study.

The results support the following observations:

- Potential water transfers using system interties are insufficient to achieve Felton water rights compliance. The North system has no unused potential diversions during months when the Felton system is not in compliance. Increased production from the Pasatiempo wells for transfer to Felton would require locally unprecedented rates of production from an over-drafted aquifer. A supplemental source, such as imports from Loch Lomond, may be needed more than 20 percent of the time to comply with water rights.

- Complying with the Felton system water rights notably increases the minimum percentages of flows remaining downstream, particularly for Bull Creek.

- Estimated increases in water production resulting from assumed increases in stream diversion capacity indicate a potential to increase yields from SLVWD's diversion streams.

- South system imports of North and/or Felton system unused potential diversions allow 30 to greater than 50 percent reductions in South system groundwater production.

- Supplementing the North system with Felton system unused potential diversions provides a 20 percent reduction in North system groundwater pumping.

- Supplementing the North system with extractions from a hypothetical ASR project supplied by North and/or Felton unused potential diversions provides roughly 30 to 60 percent net reductions in North system groundwater pumping.

- Stream diversions for in-lieu recharge and ASR occur during high-flow periods and have relatively little effect on minimum flows remaining downstream of the diversions.

- Use of SLVWD's Loch Lomond allotment allows the Felton system to comply with its permitted water rights as well as reduce South system groundwater pumping by roughly 60

to 70 percent; as a result, unused North and Felton system potential diversions are available for ASR instead of South system in-lieu recharge.

- A 60 to 70 percent reduction in South system groundwater pumping as a result of imports from Loch Lomond and/or unused potential diversions represents a significant contribution to SMGB groundwater storage recovery. The degree to which SLVWD could recover this storage is uncertain.

- Using the system interties to supply the South system with unused potential diversions uses roughly 40 and 50 percent of North and Felton system unused diversions, respectively.

- With the addition of a Loch Lomond supply, optimal use of North and Felton unused potential diversions requires ASR. As simulated under optimal conditions, ASR uses roughly half of the remaining unused diversions and helps reduce North system groundwater pumping by roughly 30 to 60 percent.

- Reduced groundwater pumping as a result of imports from Loch Lomond and the transfer of unused diversions increase the percentage of drought minimum baseflows estimated to remain in lower Newell, Zayante, and Bean creeks to 60 to 80 percent, compared to 50 percent or less for the base case.

- The remaining North and Felton system potential unused diversions (i.e., exceeding the capacity of the hypothesized ASR project) are assumed to be available for export to SVWD, which would further contribute to the recovery of SMGB groundwater storage.

In summary, system interties combined with potential supplemental water supplies provide SLVWD with significant options and flexibility for increasing conjunctive use and improving stream baseflows. The results provide qualitative indications of the potential relative magnitude and effects of the various conjunctive use alternatives. Further application of this work and the development of conjunctive use alternatives are expected to occur in the context of in-stream flow objectives proposed by fishery biologists, in addition to cost, feasibility, and water rights considerations.

1 Introduction

The San Lorenzo Valley Water District (SLVWD) and the County of Santa Cruz (the County) received California state grant funds to develop a conjunctive use plan to improve aquatic habitat and water-supply reliability within the San Lorenzo River watershed. As part of this plan's development, this water availability assessment identifies options for increasing water-supply reliability and dry-period streamflows through the conjunctive use of available surface water and groundwater resources.

SLVWD provides water to three service areas by operating three separate water systems supplied by diversions from San Lorenzo River tributaries and groundwater pumped from the Santa Margarita Groundwater Basin (SMGB; Figures 1-1 and 1-2). The North system is supplied by both stream diversions and pumped groundwater, whereas the South system is supplied solely by groundwater and the Felton system is supplied solely by stream and spring diversions (Figure 1-3). The neighboring Scotts Valley Water District (SVWD) and Mount Hermon Association (MHA) rely solely on groundwater pumped from the SMGB and, in the case of SVWD, recycled water. Each system produces water in response to immediate water demand given that these systems lack substantial surface storage.

Increasing the conjunctive use of groundwater and surface water supplies within the San Lorenzo River watershed has the potential to address several water-resource issues and opportunities. Increased conjunctive use practices may address the following issues:

- Under existing water rights, Felton system stream diversions are not permitted during defined low-flow periods and are not permitted for use outside the Felton service area.
- State and federal fish and wildlife agencies may impose limitations on the North system's pre-1914 appropriative water rights to divert surface water.
- Groundwater overdraft in the Scotts Valley area, including in the vicinity of SLVWD's South system, must be addressed in compliance with the 2014

California Sustainable Groundwater Management Act (SGMA), which includes preventing impacts to groundwater dependent ecosystems.

Opportunities that may facilitate increased conjunctive use include:

- Since 2014, SLVWD has constructed bidirectional emergency interties between its three systems and between SLVWD and SVWD. Although currently permitted for emergency use, these interties provide a potential means for transferring water supplies among service areas.
- When exceeding local demand, divertible streamflows within the North and Felton systems have the potential to supply demand in other areas and to augment groundwater recharge.
- SLVWD has an agreement, unused since 1977, allowing it to purchase from the City of Santa Cruz a portion of the water stored in Loch Lomond Reservoir, which could be used to offset stream diversions and increase groundwater storage.

The reader is referred to previous reports for descriptions of the climate, hydrology, and hydrogeology of the San Lorenzo River watershed and SLVWD's water use and management (e.g., Johnson 2009, 2015).

1.1 Objectives

This assessment evaluates alternatives for optimizing the conjunctive use of current and potential water sources, with existing and potential infrastructure, to improve aquatic habitat and water-supply reliability within the San Lorenzo River watershed. Specific objectives include:

- Optimizing the conjunctive use of available water resources for water-supply reliability and long-term sustainability.
- Reducing Felton diversions to comply with low-flow and dry-period water-rights restrictions.
- Reducing the effect of North system stream diversions and groundwater pumping on dry-period streamflows.

- Reducing groundwater pumping (e.g., by in-lieu recharge) to promote the recovery of groundwater storage and production in the South system and other portions of Scotts Valley.

The considered means for achieving these objectives include:

- Using the inter-system emergency interties to provide:
  - The Felton service area with excess water produced by the other two service areas at times when Felton system diversions are not permitted.
  - The South system and SVWD with excess stream diversions from the Felton and North systems.
  - The North system with excess diversions from the Felton system.
- Using SLVWD's Loch Lomond Reservoir allotment to reduce Felton system diversions, South system groundwater pumping, and North system diversions and groundwater pumping.
- Using excess surface water to supply an aquifer storage and recovery (ASR) project in the Olympia wellfield.

1.2 Approach

To address these objectives, this assessment performs a monthly analysis of SLVWD water demand, available supply, and production over a varied climatic cycle. This approach is based on the following assumptions:

- The evaluated climatic cycle is a repeat of the 48-year period from October 1969 through September 2017, i.e., water years (WYs) 1970–2017. This period includes three critical drought periods, WYs 1976–1977, 1987–1992, and 2012–2016, and is reasonably well supported by historical precipitation,

streamflow, and water production records (Section 1.3). The potential impacts of climate change on water supplies have not been considered.

- Average annual water demand for each service area for the design climatic cycle is based on 2045 demands projected by the 2015 SLVWD Urban Water Management Plan (UWMP) (WAC 2016) (Section 2). Water-year and monthly demand is varied in response to the climatic cycle in a manner similar to the historical record.
- The effective capacities of existing stream diversions, groundwater wells, pipelines, and treatment plants are approximated from near-maximum monthly rates achieved during the historical record (Section 3).
- Estimates of monthly total, divertible, bypassed, and downstream flows are simulated from estimated monthly frequencies of mean daily flow, adjusted for water-year percent-of-average streamflow (Section 4). Synthetic monthly flows of the San Lorenzo River and Boulder Creek are generated using the same method to trigger Felton system diversion restrictions and evaluate the effect of diversions on downstream flows. This method improves upon previous conjunctive use analyses that used monthly timesteps without accounting for daily flow variability (e.g., HEA 1983, 1984; Geomatrix 1999; Johnson 2009, 2015, 2016).
- The historical record of groundwater pumping, groundwater levels, and precipitation is used to estimate sustainable rates of seasonal groundwater production during average and wet years and reduced rates of production as a result of lowered groundwater levels during drought years (Section 5). The application of numerical models to obtain more dynamic estimates of groundwater-surface water interactions was outside the scope of this study.

On this basis, Section 6 presents analyses of monthly water supply and demand for the WY 1970–2017 climatic cycle that address the objectives presented in Section 1.1. Alternative conjunctive use scenarios are compared to a base case representative of the proportional use of

surface water and groundwater supplies during WYs 2000–2017. Four alternative scenarios are analyzed:

- **Scenario 1** optimizes the use of current sources assuming existing or modified infrastructure.
- **Scenario 2** adds the use of SLVWD's allotment of Loch Lomond Reservoir storage.
- **Scenario 3** increases the yield of the Olympia wellfield through operating an ASR project supplied by surface water supplies in excess of monthly water demand.
- **Scenario 4** uses available surface water in excess of local demand to further increase groundwater storage in the Scotts Valley area through in-lieu recharge (i.e., in addition to in-lieu recharge for the Pasatiempo area in Scenarios 1 through 3).

The results of each case are summarized in tables and plots, including monthly plots of the estimated percent of streamflow remaining downstream of each diversion. Appendix A provides the tabulated monthly results for the simulated base case and each alternative conjunctive use scenario.

Section 7 provides conclusions and recommendations based on a summary of the results.

1.3 Available Data

Tables 1-1 and 1-2 summarize data records relevant to this study for precipitation, streamflow, diversions, and groundwater levels and pumping.

The climatic record is well represented by several stations with long-term precipitation records and the U.S. Geological Survey (USGS) gauging record for the San Lorenzo River at the Big Trees (SLRBT) station near Felton (Tables 1-1 and 1-2; Figure 1-4). However, the applicability

of the SLRBT record to SLVWD's tributary diversion watersheds is limited because of significant differences in watershed area, physiography, hydrology, geology, and land use.

SLVWD has records of its North system monthly surface water diversions beginning January 1984 (Table 1-1). The available record for the Felton system surface water diversions extends back to January 1993. Because the diversion streams have not been fully gauged until recently, these records provide a lower bound for estimating total streamflow. Previous studies have extrapolated these records on a monthly basis to estimate potential diversions under existing infrastructure and water-rights conditions (Johnson 2009, 2015). However, these records are insufficient for estimating the remaining portion of streamflow available to support habitat or the potential for additional diversions.

Each SLVWD diversion stream has been gauged more or less continuously since 2013 or 2014 (Table 1-1). Except for the gauge immediately upstream of the Fall Creek diversion, the gauged records do not include the amount diverted. The first years of gauging coincided with the WY 2012–2015 drought, followed by nearly average precipitation in WY 2016, and a very wet WY 2017. Despite nearly average to well-above-average precipitation in WYs 2016 and 2017, stream baseflows during those years had not recovered fully from the preceding drought. Provisional gauging records of mean daily flow expressed in cubic feet per second (cfs) were provided for this study (Ruttenberg 2018, pers. comm.).

SLVWD has records of its North and South system monthly groundwater pumping since January 1984 and groundwater levels as early as 1976 (Table 1-1). SVWD and MHA groundwater pumping and water-level records extend back to 1976 and 1992, respectively.

Table 1-2 summarizes periods of record for selected stream gauges other than those summarized in Table 1-1. Boulder Creek, the receiving stream for two SLVWD North system diversion streams, was gauged continuously by the USGS during WYs 1969–1993. USGS-gauged streams potentially influenced by SLVWD groundwater pumping include Zayante Creek (gauged WYs 1958–1993) and Bean Creek (gauged WYs 1989–2007). Other USGS gauged streams with watershed conditions somewhat similar to SLVWD's diversion watersheds include Laguna and Majors creeks (gauged WYs 1969–1976) and San Vicente Creek (gauged WYs 1970–1985;

Figure 1-4). The County has gauged streams at stations throughout the San Lorenzo River watershed with varying frequency since 1975, mostly under low-flow conditions. Since 2014, gauging has been conducted for SLVWD at stations on Boulder, Zayante, Lompico, and Bean creeks, and the San Lorenzo River (Balance Hydrologics 2015, 2016, 2018). The City of Santa Cruz has gauged Newell Creek during portions of WYs 2009–2010 and 2014–2016 (Bassett 2018, pers. comm.).

Data Set	Water Years*																																																	
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Monthly precipitation (selected stations)																																																		
Ben Lomond 4				x																																														
Lockheed	←1889																																																	
SLVWD office																																																		
Santa Cruz	←1868																																																	
Diversion watershed stream flows																																																		
Peavine Creek at diversion**															e	e	e	e	e	e	e	e	e	e	e	e	e	e																x			x	x
Foreman Ck at and downstream of diversion**															e	e	e	e	e	e	e	e	e	e	e	e	e	e																	x		x	x
Clear Creek at diversion**															e	e	e	e	e	e	e	e	e	e	e	e	e	e																	x			
Sweetwater Creek at diversion**															e	e	e	e	e	e	e	e	e	e	e	e	e	e																	x			
Fall Creek up and down stream of diversion																																																x
Bull Creek downstream of diversion																																													x			x
Monthly spring and stream diversions																																																		
SLVWD diversions																																																		
North system															x												(x)																						
Felton system																								x																									
LCWD diversions																																												x					
Metered SLVWD surface-water treatment																																																		
North system Lyon WTP																																																		
Felton system Kirby WTP																																																		
Metered groundwater levels and pumping																																																		
SLVWD North system wells																																																		
Pumping															x																																			
Quail Hollow water levels																																																		
Olympia water levels																																																		
SLVWD South system wells																																																		
Pumping															x																																			
Water levels																																																		
SVWD wells																																																		
Pumping																																																		
Water levels																																																		
MHA wells																																																		
Pumping																																																		
Water levels																																																		

Sources:

- Balance Hydrologics (2016, 2018) for SLVWD
- California American Water records
- Citizen Utilities records
- Geomatrix Consultants (1999) for SLVWD
- Lockheed records
- Lompico County Water District records
- Mount Hermon Association records
- NOAA (https://www.ncdc.noaa.gov/cdo-web/datasets)
- SLVWD records
- SVWD records

wet year: 1983
dry year: 1976

Wet year ≥ 125% of average water-year rainfall
Dry year ≤ 80% average water-year rainfall

* e.g., water year 2017 extended from October 1, 2016 through September 30, 2017.

** Gauged records for "at diversion" exclude diverted flows.

x Partial water-year record.

(x) Point of diversions moved upstream to provide gravity flow to Lyon WTP.

e Estimated monthly flow record.

Table 1-1
Periods of Record for Precipitation, Stream Diversions, and Groundwater Water Levels and Pumping

| Stream | Gauge No. | No. Measure-ments | Water Years* | | |

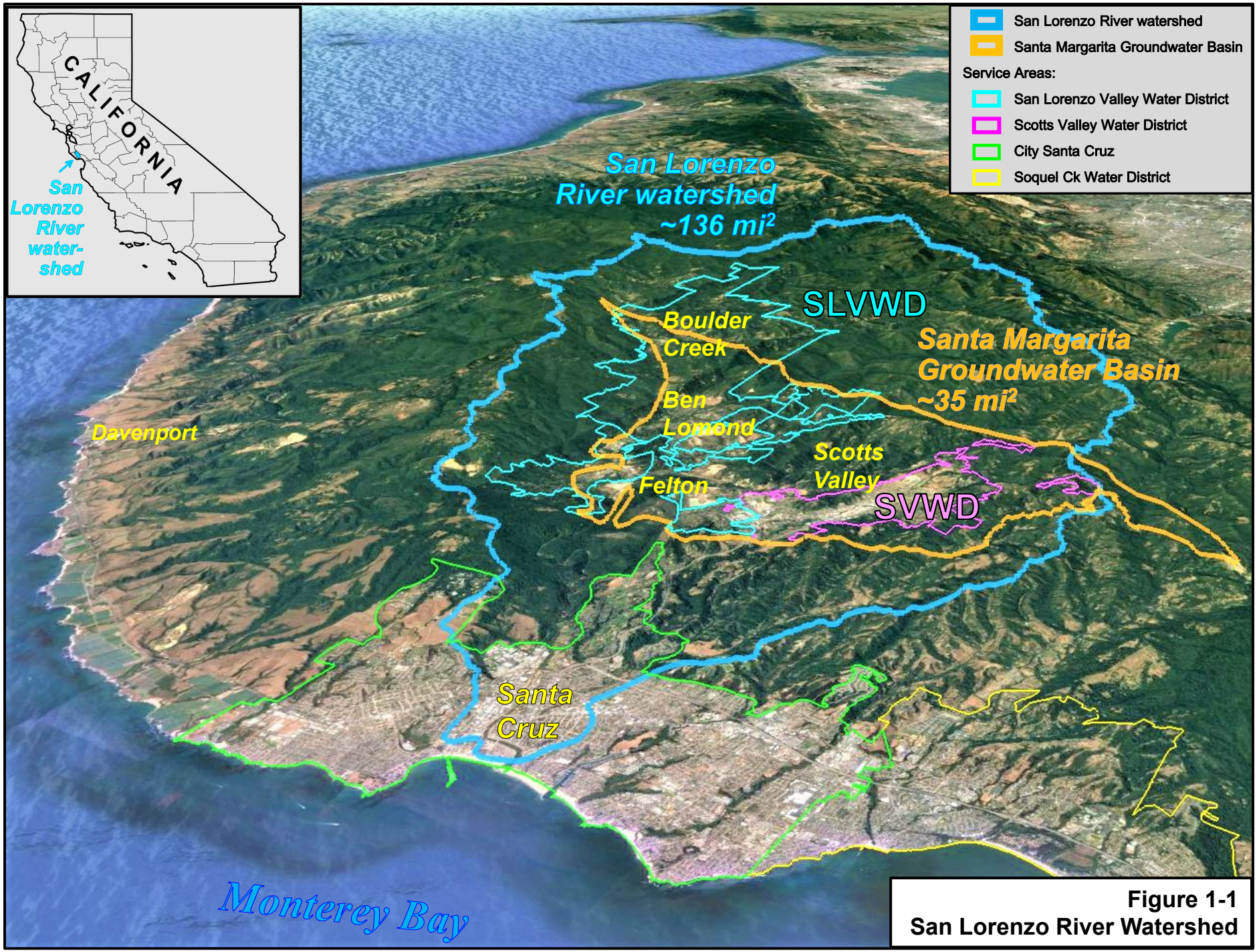


Figure 1-1
San Lorenzo River Watershed

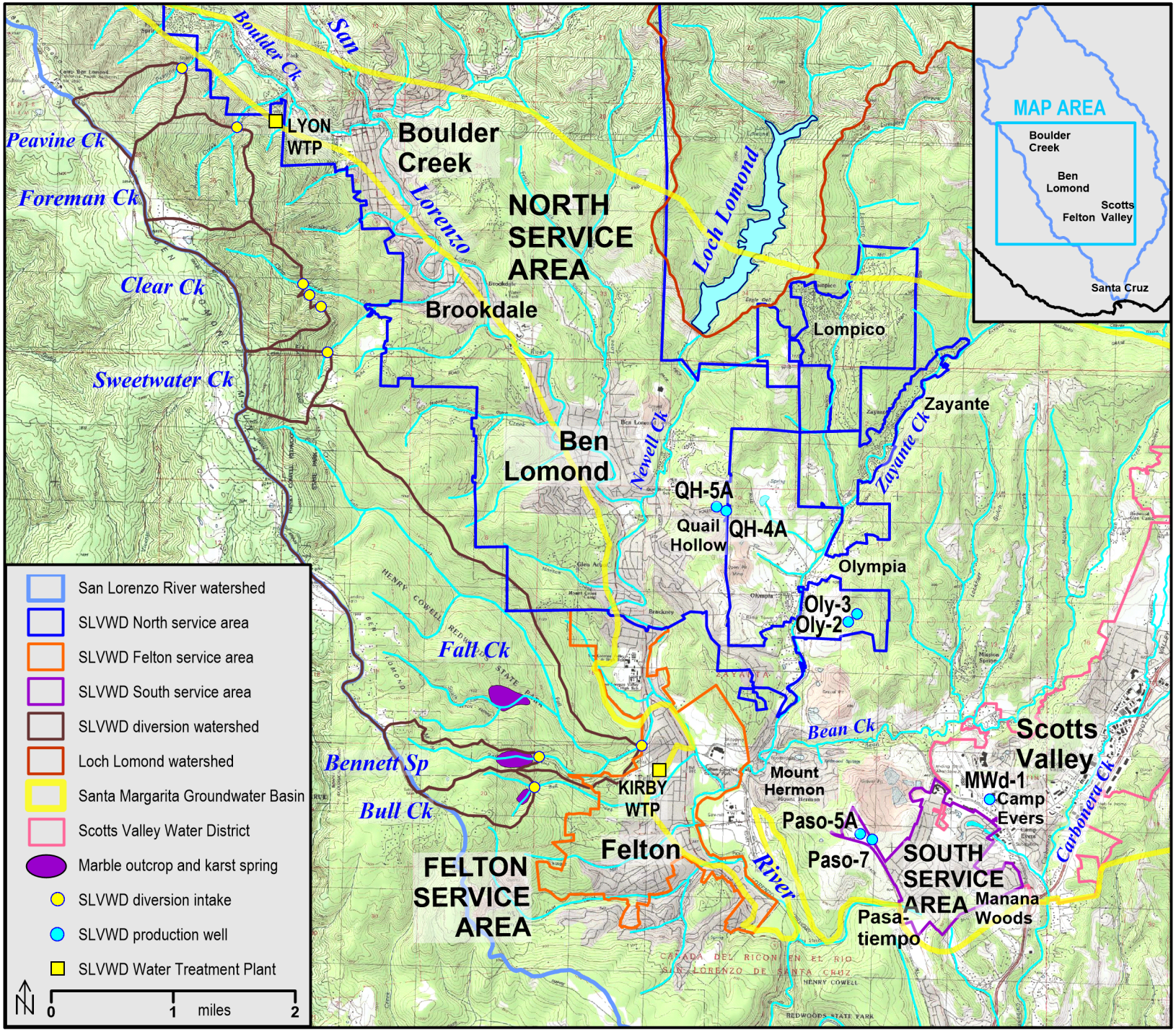
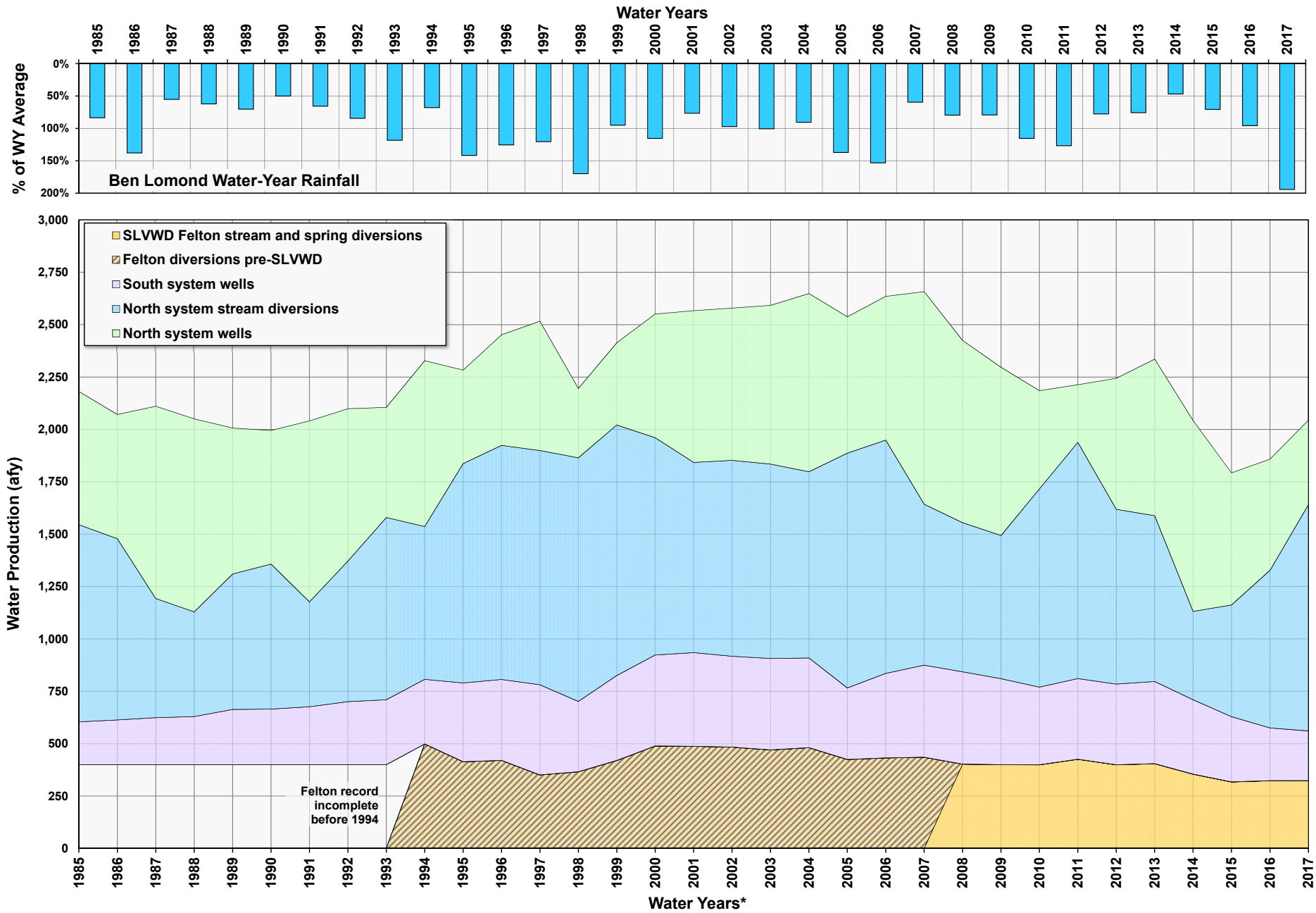


Figure 1-2
SLVWD Service Areas, Diversion Watersheds, Points of Diversion, Treatment Plants, and Production Wells



afy acre-feet per year

* e.g., WY 2018 was from October 1, 2017 to September 30, 2018.

Figure 1-3
SLVWD Annual Water Production by System, WYs 1985–2017

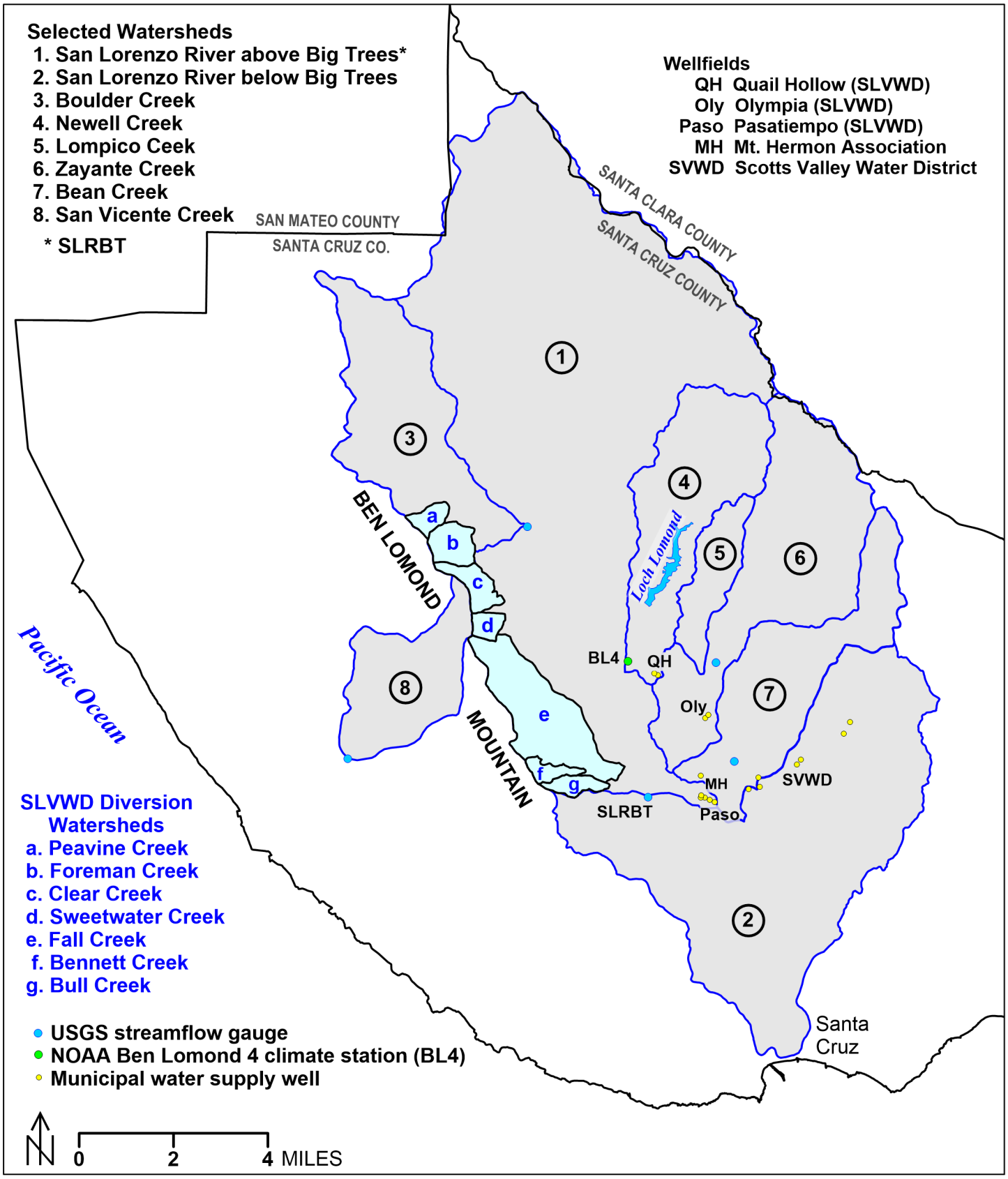


Figure 1-4
Selected Watershed Areas,
North-Central Santa Cruz County

2 Water Demand

SLVWD's record of monthly raw water production is nearly equivalent to its customer monthly water demand. This is because SLVWD's above-ground storage, imports, and exports of water are minor. Surface water is diverted and treated, and groundwater is pumped, only in response to fairly immediate water demand. SLVWD has sold relatively small amounts of water to MHA and SVWD under short-term, emergency situations and similarly has purchased relatively small amounts of water from SVWD, in each case less than 1 percent of SLVWD's annual water supply. This study defines water demand as total water use, including system losses and other unaccounted for produced water.

Table 2-1 provides the available record of annual water production from SLVWD's current sources since WY 1985 as well as a partial record for WY 1977. Annual water production for the North, South, and Felton service areas is plotted in Figures 2-1, 2-2, and 2-3, respectively.

Based on estimated 2045 total water demand for each SLVWD service area (WSC 2016), and including water demand for the recently annexed Lompico area (now part of the North service area), this study assumes the following average annual water demand:

- North service area: 1,545 acre-feet per year (afy)
- South service area: 365 afy
- Felton service area: 430 afy

SLVWD annual water demand fluctuates by as much as approximately ±20 percent in response to the climatic cycle, with the following characteristics (Johnson 2009, 2015):

- During multi-year droughts (e.g., 1976–1977, 1987–1992, and 2007–2009), water use may increase initially before declining in response to voluntary or mandatory water conservation.
- Reduced demand may persist for a year or more following a drought.

- Water demand tends to decrease during years with exceptionally high precipitation.
- Water demand tends to gradually increase to above-average levels between droughts.
- Water demand may vary as a result of additional factors, e.g., the significant reduction in water demand that occurred in apparent response to the economic recession that began in 2008.
- SLVWD's three service areas have not responded identically to these influences (Figures 2-1, 2-2, and 2-3).

Table 2-2 presents values of annual water demand assumed by this study for each SLVWD service area for the WY 1970–2017 design climatic cycle. In response to the climatic cycle, assumed annual demands vary above and below the projected 2045 average demand in a manner similar to the historical record of each service area. Figures 2-1, 2-2, and 2-3 compare the historical and assumed annual water demand for the North, South, and Felton service areas, respectively. Figure 2-4 is a plot of assumed annual demand for all three service areas.

The assumed annual demands are distributed monthly for each service area based on average monthly percentages for near-to-above average, dry, and very dry years (Figure 2-5). The monthly distribution of demand during the driest years reflects conservation rates of up to 40 percent during dry-season months of peak use.

Estimated SVWD water demand for 2040 is approximately 1,650 afy, of which 250 afy is assumed to be supplied by recycled water (Kennedy/Jenks 2016).

Water Year		Percent of Average Rainfall at Ben Lomond	North System						South System Wells	Felton Diver-sions[b]	Total	
			Stream Diversions		Wells		Loch Lomond	Total Produc-tion			by SLVWD	All Current Sources
			afy	%[a]	afy	%[a]	afy					
1977[c]		41%	400	53%	350	47%	350	1,100	160	-	1,260	-
1984		83%	-	-	-	-	-	-	-	-	-	-
1985		83%	941	60%	636	40%	0	1,576	204	-	1,781	-
1986		137%	865	59%	593	41%	0	1,457	214	-	1,671	-
1987		55%	569	38%	918	62%	0	1,486	224	-	1,710	-
1988		62%	500	35%	921	65%	0	1,421	229	-	1,650	-
1989		70%	647	48%	697	52%	0	1,344	263	-	1,607	-
1990		50%	693	52%	637	48%	0	1,330	265	-	1,595	-
1991		65%	501	37%	863	63%	0	1,364	276	-	1,640	-
1992		84%	671	48%	727	52%	0	1,398	301	-	1,698	-
1993		118%	870	62%	526	38%	0	1,395	310	-	1,705	1,705
1994		67%	729	48%	792	52%	0	1,521	308	498	1,829	2,328
1995		141%	1,047	70%	446	30%	0	1,493	376	414	1,869	2,283
1996		125%	1,117	68%	528	32%	0	1,645	386	420	2,031	2,451
1997		120%	1,118	64%	618	36%	0	1,735	430	351	2,165	2,516
1998		169%	1,163	78%	331	22%	0	1,494	336	366	1,829	2,195
1999		94%	1,196	75%	392	25%	0	1,588	406	419	1,994	2,413
2000		115%	1,037	64%	590	36%	0	1,628	434	489	2,062	2,551
2001		76%	908	56%	724	44%	0	1,632	447	487	2,079	2,567
2002		96%	935	56%	727	44%	0	1,662	433	484	2,095	2,579
2003		100%	928	55%	758	45%	0	1,685	436	470	2,122	2,592
2004		90%	889	51%	851	49%	0	1,739	428	481	2,167	2,648
2005		136%	1,121	63%	651	37%	0	1,772	341	424	2,113	2,538
2006		152%	1,114	62%	686	38%	0	1,800	403	432	2,203	2,635
2007		59%	768	43%	1,015	57%	0	1,783	440	435	2,223	2,658
2008		79%	712	45%	870	55%	0	1,581	441	402	2,079	2,425
2009		79%	684	46%	803	54%	0	1,486	410	400	2,297	2,297
2010		115%	947	67%	468	33%	0	1,415	371	399	2,185	2,185
2011		126%	1,128	80%	275	20%	0	1,403	385	426	2,213	2,213
2012		77%	834	57%	625	43%	0	1,460	386	399	2,244	2,244
2013		75%	791	51%	747	49%	0	1,538	392	405	2,335	2,335
2014		47%	421	32%	911	68%	0	1,332	355	354	2,042	2,042
2015		70%	534	46%	631	54%	0	1,164	311	317	1,793	1,793
2016		95%	753	59%	530	41%	0	1,283	252	323	1,858	1,858
2017		193%	1,080	73%	404	27%	0	1,484	237	324	2,044	2,044
2018												
1985-2017	avg	98%	855	56%	663	44%	0	1,518	346	413	1,968	2,324
	min	47%	421	32%	275	20%	0	1,164	204	317	1,595	1,705
	max	193%	1,196	80%	1,015	68%	0	1,800	447	498	2,335	2,658
2000-2017	avg	99%	866	56%	681	44%	0	1,547	384	414	2,120	2,345
	min	47%	421	32%	275	20%	0	1,164	237	317	1,793	1,793
	max	193%	1,128	80%	1,015	68%	0	1,800	447	489	2,335	2,658

Apparent partial record.

Not part of SLVWD.

- No or partial record.

afy acre-feet per year

avg average

max maximum

min minimum

WY water year, e.g., WY 2018 was from October 1, 2017 to September 30, 2018.

[a] Percent of North system annual supply.

[b] Adjusted for WTP bypass flows.

[c] WY 1977 is for July 1976 through June 1977; WY 1984 partial record.

Table 2-1

SLVWD Annual Water Use by Service Area, WYs 1977 and 1985–2017

	Water Year	Rainfall Percent of Average*	SLVWD Service Area						
			North		South		Felton		Total
			% dfa	afy	% dfa	afy	% dfa	afy	afy
1	1970	108%	0.0%	1,544	0.0%	360	0.0%	418	2,323
2	1971	90%	0.0%	1,544	0.0%	360	0.0%	418	2,323
3	1972	64%	7.5%	1,660	10.0%	395	15.0%	486	2,542
4	1973	138%	2.5%	1,583	0.0%	360	5.0%	441	2,384
5	1974	146%	0.0%	1,544	-2.5%	351	0.0%	418	2,314
6	1975	86%	5.0%	1,621	5.0%	378	10.0%	464	2,463
7	1976	44%	-5.0%	1,467	-5.0%	343	-5.0%	396	2,205
8	1977	41%	-17.5%	1,274	-17.5%	299	-20.0%	328	1,901
9	1978	144%	-5.0%	1,467	-5.0%	343	-2.5%	407	2,217
10	1979	87%	2.5%	1,583	2.5%	369	5.0%	441	2,393
11	1980	125%	0.0%	1,544	0.0%	360	0.0%	418	2,323
12	1981	67%	5.0%	1,621	17.5%	422	12.5%	475	2,518
13	1982	164%	0.0%	1,544	2.5%	369	2.5%	430	2,343
14	1983	195%	-2.5%	1,506	-5.0%	343	-2.5%	407	2,255
15	1984	82%	5.0%	1,621	5.0%	378	10.0%	464	2,463
16	1985	83%	7.5%	1,660	22.5%	439	17.5%	498	2,597
17	1986	137%	-2.5%	1,506	-2.5%	351	-2.5%	407	2,264
18	1987	55%	0.0%	1,544	5.0%	378	2.5%	430	2,352
19	1988	62%	-2.5%	1,506	-2.5%	351	-2.5%	407	2,264
20	1989	70%	-7.5%	1,428	-10.0%	325	-10.0%	373	2,127
21	1990	50%	-10.0%	1,390	-15.0%	307	-15.0%	351	2,048
22	1991	65%	-7.5%	1,428	-12.5%	316	-10.0%	373	2,118
23	1992	84%	-5.0%	1,467	-7.5%	334	-5.0%	396	2,197
24	1993	118%	-5.0%	1,467	-5.0%	343	2.5%	430	2,239
25	1994	67%	2.5%	1,583	5.0%	378	12.5%	475	2,435
26	1995	141%	0.0%	1,544	0.0%	360	7.5%	452	2,357
27	1996	125%	5.0%	1,621	2.5%	369	7.5%	452	2,443
28	1997	120%	10.0%	1,699	10.0%	395	0.0%	418	2,512
29	1998	169%	-2.5%	1,506	-5.0%	343	5.0%	441	2,289
30	1999	94%	0.0%	1,544	2.5%	369	10.0%	464	2,377
31	2000	115%	0.0%	1,544	12.5%	404	15.0%	486	2,435
32	2001	76%	2.5%	1,583	17.5%	422	17.5%	498	2,502
33	2002	96%	5.0%	1,621	12.5%	404	15.0%	486	2,512
34	2003	100%	7.5%	1,660	15.0%	413	12.5%	475	2,548
35	2004	90%	10.0%	1,699	10.0%	395	15.0%	486	2,580
36	2005	136%	12.5%	1,737	0.0%	360	7.5%	452	2,550
37	2006	152%	15.0%	1,776	12.5%	404	10.0%	464	2,644
38	2007	59%	12.5%	1,737	20.0%	430	10.0%	464	2,631
39	2008	79%	5.0%	1,621	20.0%	430	5.0%	441	2,493
40	2009	79%	2.5%	1,583	5.0%	378	2.5%	430	2,390
41	2010	115%	0.0%	1,544	0.0%	360	2.5%	430	2,334
42	2011	126%	0.0%	1,544	0.0%	360	5.0%	441	2,345
43	2012	77%	-2.5%	1,506	0.0%	360	2.5%	430	2,295
44	2013	75%	0.0%	1,544	2.5%	369	5.0%	441	2,354
45	2014	47%	-10.0%	1,390	-10.0%	325	-7.5%	385	2,099
46	2015	70%	-20.0%	1,235	-17.5%	299	-17.5%	339	1,873
47	2016	95%	-12.5%	1,351	-17.5%	299	-15.0%	351	2,000
48	2017	193%	-5.0%	1,467	-10.0%	325	-12.5%	362	2,154
Avg.**		100%	0.1%	**1,545**	1.4%	**365**	2.6%	**430**	**2,340**
Min.		41%	-20%	1,235	-17.5%	299	-20%	328	1,873
Max.		195%	15%	1,776	22.5%	439	17.5%	498	2,644

Percent of Average Rainfall

- >80% and <125%
- ≥125%
- ≤80%
- ≤60%

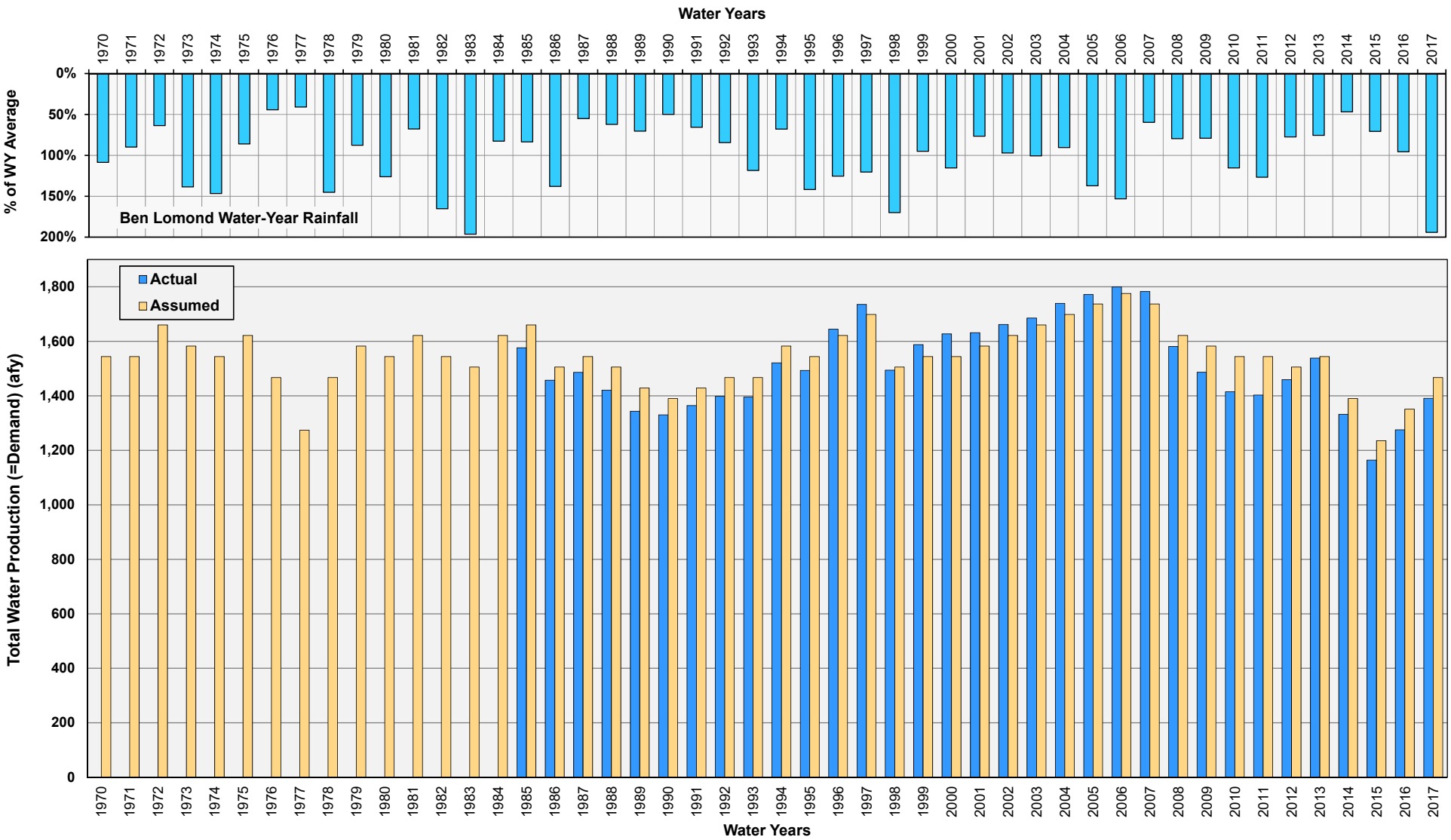
% dfa assumed percent departure from average

afy acre-feet per year

* NOAA Ben Lomond 4 station (estimated for WYs 1970-1974; Johnson, 2015)

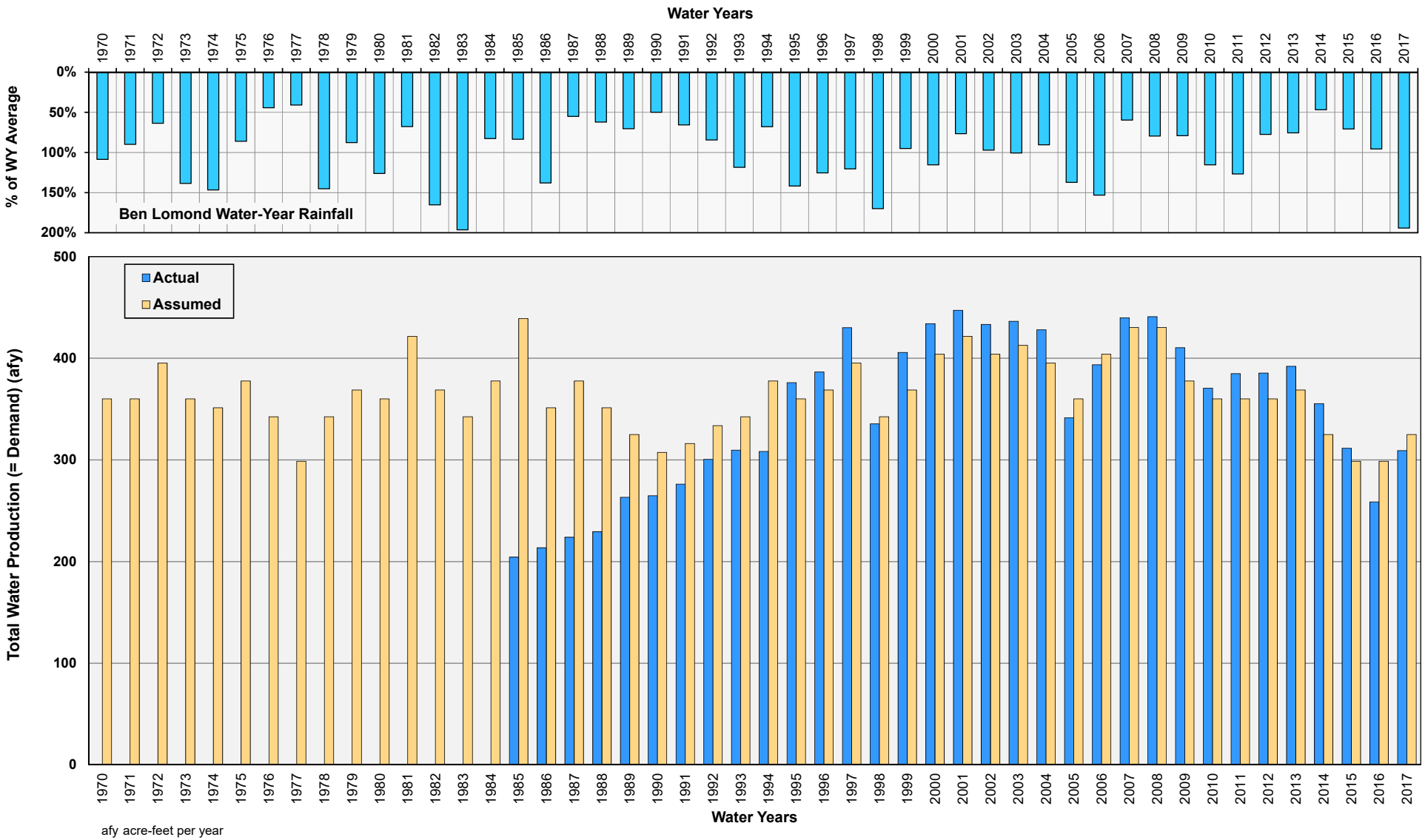
** Averages adopted from 2015 UWMP for WY 2045 (WAC, 2016); approximately 50 AFY are added to the North service area projected demand to account for the recent annexation of the Lompico service area.

Table 2-2
Assumed Water Demand for Design Climatic Period, WYs 1970–2017



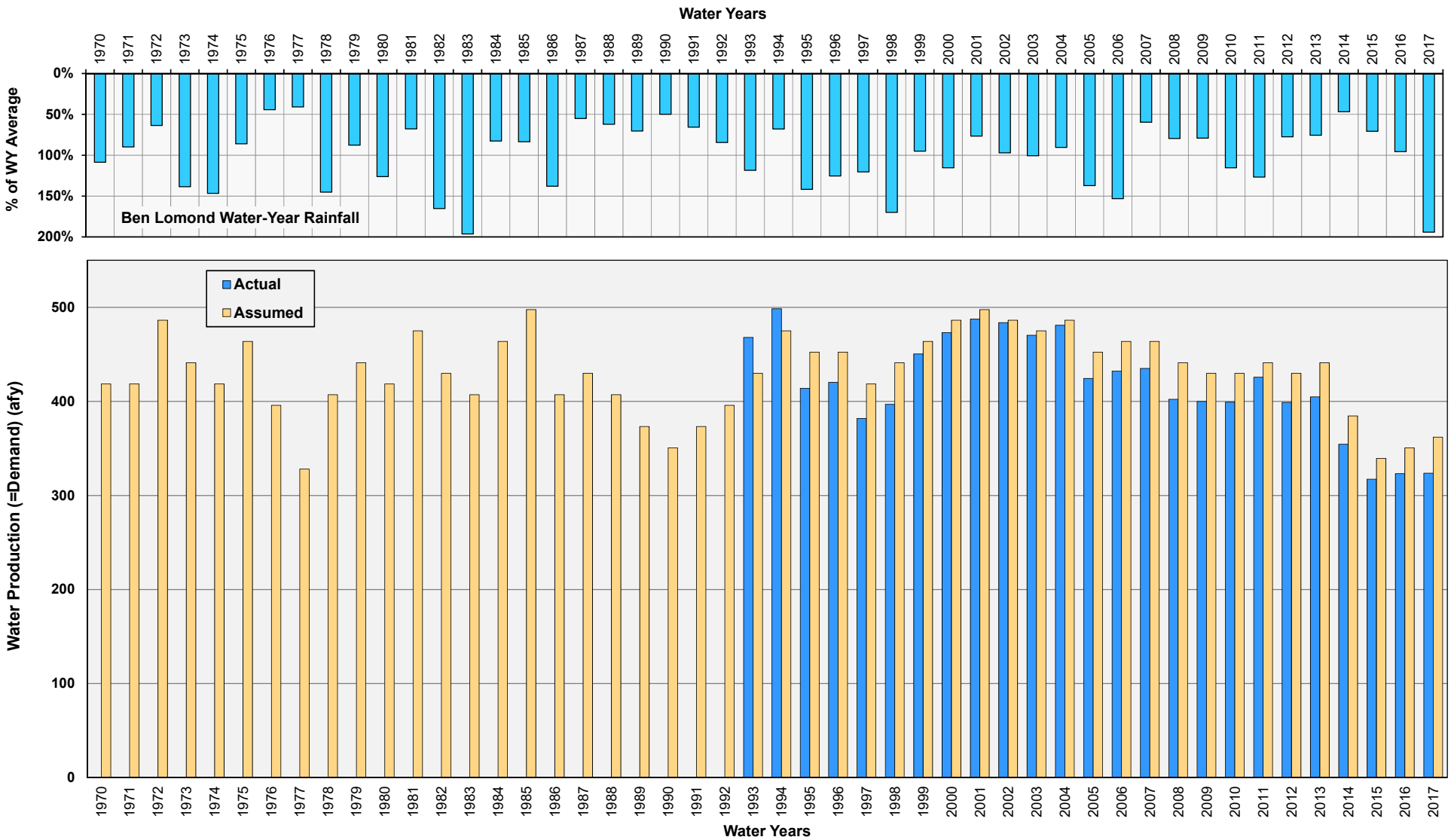
afy acre-feet per year
WY water year, e.g., WY 2018 was October 1, 2017 to September 30, 2018.

Figure 2-1
Historical and Assumed 2045 North Service Area Water Demand, WYs 1970–2017 Climatic Period



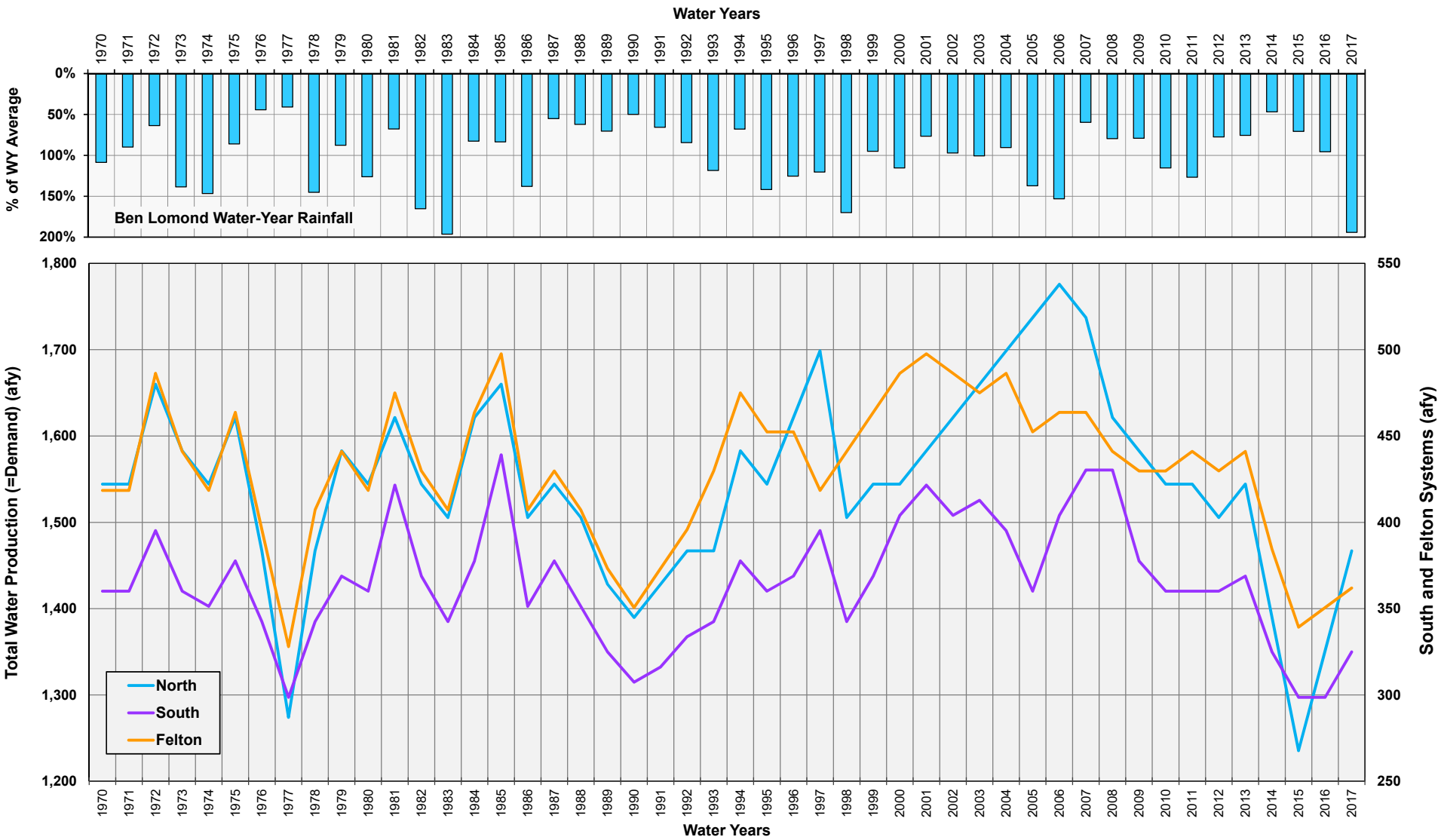
afy acre-feet per year
WY water year, e.g., WY 2018 was October 1, 2017 to September 30, 2018.

Figure 2-2
Historical and Assumed 2045 South Service Area Water Demand, WYs 1970–2017 Climatic Period



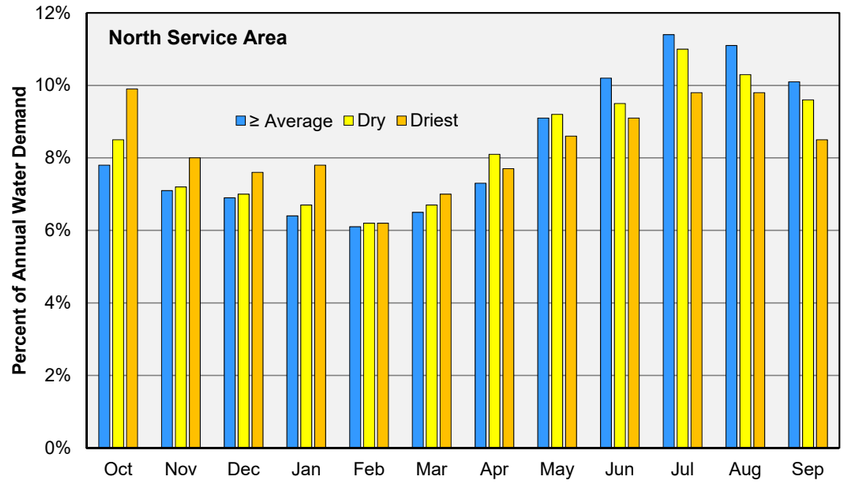
afy acre-feet per year
WY water year, e.g., WY 2018 was October 1, 2017 to September 30, 2018.

Figure 2-3
Historical and Assumed 2045 Felton Service Area Water Demand, WYs 1970–2017 Climatic Period



afy acre-feet per year
WY water year, e.g., WY 2018 was October 1, 2017 to September 30, 2018.

Figure 2-4
Assumed 2045 Water Demand by Service Area, WYs 1970–2017 Climatic Period



Percent of WY Demand			
North	≥ Average	Dry	Driest
Oct	7.8%	8.5%	9.9%
Nov	7.1%	7.2%	8.0%
Dec	6.9%	7.0%	7.6%
Jan	6.4%	6.7%	7.8%
Feb	6.1%	6.2%	6.2%
Mar	6.5%	6.7%	7.0%
Apr	7.3%	8.1%	7.7%
May	9.1%	9.2%	8.6%
Jun	10.2%	9.5%	9.1%
Jul	11.4%	11.0%	9.8%
Aug	11.1%	10.3%	9.8%
Sep	10.1%	9.6%	8.5%
WY	100%	100%	100%

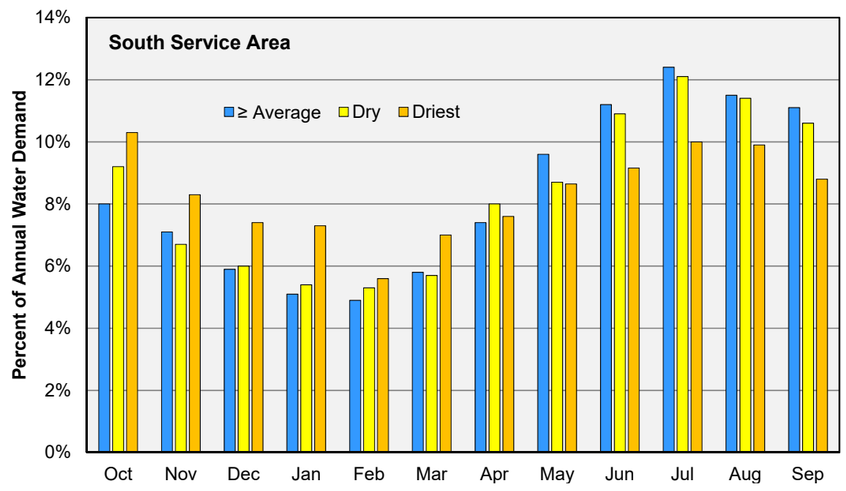
Monthly Demand (af)			
North	Average	Dry	Driest
Oct	121	118	122
Nov	110	100	99
Dec	107	97	94
Jan	99	93	96
Feb	94	86	77
Mar	100	93	86
Apr	113	113	95
May	141	128	106
Jun	158	132	112
Jul	176	153	121
Aug	171	143	121
Sep	156	133	105
WY	1,545	1390*	1235**

Percent Conservation		
North	Dry	Driest
Oct	2%	-1%
Nov	9%	10%
Dec	9%	12%
Jan	6%	3%
Feb	9%	19%
Mar	7%	14%
Apr	0%	16%
May	9%	24%
Jun	16%	29%
Jul	13%	31%
Aug	17%	29%
Sep	14%	33%
WY	9%	18%

Assumption basis:
Recent near-average period:
approximate monthly averages for WYs 2008-2012.
Dry years:
approximate monthly averages for WYs 1988-1991, 2009, 2013.
Driest years:
approximate monthly averages for WYs 2014, 2015.

af acre-feet
* Average of average and driest.
** Minimum value from Table 2-2.
WY water year

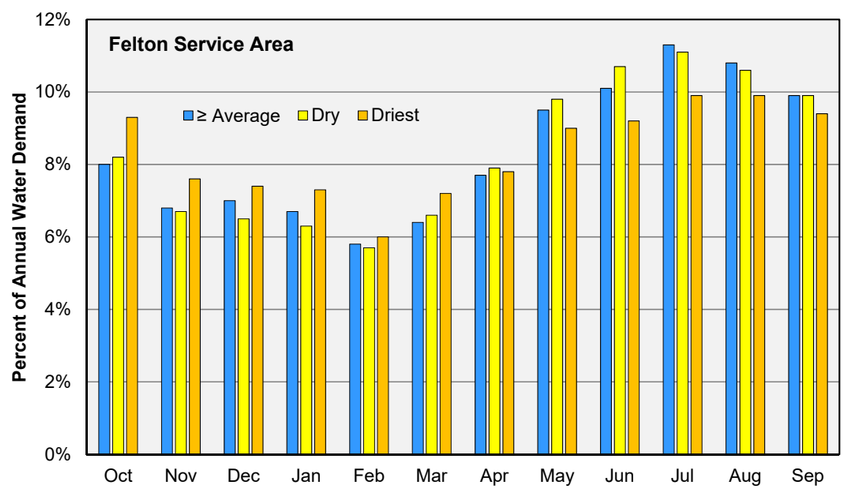
See Table 2-2 for WY rainfall record.
Percent conservation calculated from monthly acre-feet values as (average − dry or driest) ÷ average.



Percent of WY Demand			
South	≥ Average	Dry	Driest
Oct	8.0%	9.2%	10.3%
Nov	7.1%	6.7%	8.3%
Dec	5.9%	6.0%	7.4%
Jan	5.1%	5.4%	7.3%
Feb	4.9%	5.3%	5.6%
Mar	5.8%	5.7%	7.0%
Apr	7.4%	8.0%	7.6%
May	9.6%	8.7%	8.6%
Jun	11.2%	10.9%	9.2%
Jul	12.4%	12.1%	10.0%
Aug	11.5%	11.4%	9.9%
Sep	11.1%	10.6%	8.8%
WY	100%	100%	100%

Monthly Demand (af)			
South	Average	Dry	Driest
Oct	29	31	31
Nov	26	22	25
Dec	22	20	22
Jan	19	18	22
Feb	18	18	17
Mar	21	19	21
Apr	27	27	23
May	35	29	26
Jun	41	36	27
Jul	45	40	30
Aug	42	38	30
Sep	41	35	26
WY	365	332*	299**

Percent Conservation		
South	Dry	Driest
Oct	-5%	-5%
Nov	14%	4%
Dec	8%	-3%
Jan	4%	-17%
Feb	2%	7%
Mar	11%	1%
Apr	2%	16%
May	18%	26%
Jun	12%	33%
Jul	11%	34%
Aug	10%	30%
Sep	13%	35%
WY	8%	13%



Percent of WY Demand			
Felton	≥ Average	Dry	Driest
Oct	8.0%	8.2%	9.3%
Nov	6.8%	6.7%	7.6%
Dec	7.0%	6.5%	7.4%
Jan	6.7%	6.3%	7.3%
Feb	5.8%	5.7%	6.0%
Mar	6.4%	6.6%	7.2%
Apr	7.7%	7.9%	7.8%
May	9.5%	9.8%	9.0%
Jun	10.1%	10.7%	9.2%
Jul	11.3%	11.1%	9.9%
Aug	10.8%	10.6%	9.9%
Sep	9.9%	9.9%	9.4%
WY	100%	100%	100%

Monthly Demand (af)			
Felton	Average	Dry	Driest
Oct	34	31	31
Nov	29	25	25
Dec	30	25	24
Jan	29	24	24
Feb	25	22	20
Mar	28	25	24
Apr	33	30	26
May	41	37	30
Jun	43	41	30
Jul	49	42	32
Aug	46	40	32
Sep	43	38	31
WY	430	379*	328**

Percent Conservation		
Felton	Dry	Driest
Oct	10%	11%
Nov	13%	15%
Dec	18%	19%
Jan	17%	17%
Feb	13%	21%
Mar	9%	14%
Apr	10%	23%
May	9%	28%
Jun	7%	31%
Jul	13%	33%
Aug	13%	30%
Sep	12%	28%
WY	12%	22%

Figure 2-5
Assumed Monthly Water Demand as Percent of Annual Demand for Near-to-Above Average, Dry, and Driest Years

3 System Capacities

SLVWD's three water systems are currently supplied by the following surface water and groundwater sources:

North System	South System	Felton System
Active Stream Diversions (number of points of diversion)		
Peavine Creek (1) Foreman Creek (1) Clear Creek (3) Sweetwater Creek (1)	none	Fall Creek (1) Bennett Spring (2) Bull Creek (2)
Surface Water Treatment Plants (WTP)		
Lyon WTP	none	Kirby WTP
Active Groundwater Wells		
Quail Hollow (QH) wells: QH-4A and QH-5A Olympia (Oly) wells: Oly-2 and Oly-3	Pasatiempo (Paso) wells: Paso-5A and Paso-8* (*under construction as replacement for Paso-7)	none

Figure 3-1 schematically illustrates the configuration and interconnection of these water sources within and between the three systems. Table 3-1 provides a detailed record of the water produced by these sources since WY 1985.

Table 3-2 provides the twenty highest ranked monthly yields of each SLVWD source during the period of record, expressed as an equivalent continuous rate in gallons per minute (gpm). Table 3-3 summarizes the design, peak-month, and planned capacities of SLVWD diversions, wells, conveyance, and treatment facilities.

Based on maximum monthly rates of record (Tables 3-2 and 3-3), SLVWD's stream and spring diversions have the following estimated maximum capacities (expressed as equivalent continuous monthly rates):

North service area:	**gpm**	**cfs**
Foreman Creek	930	2.1
Peavine Creek	270	0.6
Clear Creek	300	0.7
Sweetwater Creek	260	0.6
Felton service area:	**gpm**	**cfs**
Fall Creek	280	0.6
Bennett Spring (to WTP)	200	0.45
Bennett Spring (2-in. line)	13	0.03
Bull Creek	225	0.5

These maximum rates generally cannot occur simultaneously because of limited raw water conveyance and treatment capacities. For example, the diversion capacities of Foreman, Peavine, Clear, and Sweetwater creeks exceeds the 1,100-gpm capacity of the trunk raw water line from the Foreman mixing vault to the Lyon water treatment plant (WTP) (Table 3-3).

North system diversions are processed by the Lyon WTP, which has a design capacity of 1,100 gpm, a maximum monthly output equivalent to approximately 980 gpm, and a potential capacity of 1,650 gpm if expanded. Felton system diversions are processed by the Kirby WTP, which has a design capacity of 700 gpm but typically operates at half capacity using only one of two units. The maximum continuous monthly production rate of the Kirby WTP is approximately 425 gpm (Table 3-3).

Based on maximum monthly rates of record (Table 3-2), SLVWD's groundwater production wells have the following estimated maximum capacities (expressed as equivalent continuous monthly rates):

North service area:	**gpm**	**cfs**
Quail Hollow wells	545	1.2
Olympia wells	780	1.7
Quail Hollow and Olympia wells	1,150	2.6
South service area:		
Pasatiempo wells	435	1.0

The design capacities of the inter-system emergency interties are as follows (Table 3-3):

System Intertie:	gpm	cfs
North-South	150/300/550 [a]	0.3/0.7/1.2 [a]
North-Felton	150	0.3
Felton-South (via North/direct)	150	0.3
South-SVWD	350	0.8

[a] current/expected/potential

Inspection of Table 3-2 suggests that maximum-monthly rates of water production, conveyance, and treatment may be considered outliers representative of peak performance during optimal circumstances atypical of normal conditions. Peak diversion rates reflect a combination of various operational constraints, including water rights; high-flow limitations; and limited intake, conveyance, and treatment capacities. The effective capacities assumed for simulating conjunctive use scenarios in Section 6 are generally somewhat less than the highest ranked monthly rates of record.

Water Year	WY Rainfall at Ben Lomond	North System																				South System									Felton System									Total	
		Stream Diversions								Wells								Interties					Pasatiempo Wells						Intertie		Streams		Bennett Spring				Intertie				
										Quail Hollow			Olympia																												
		Fore-man Ck	Pea-vine Ck	Fore-man & Pea-vine Cks	Clear Ck	Sweet-water Ck	Clear & Sweet-water Cks	Other Cks	Total	QH-4	QH-5	Total	Oly-2	Oly-3	Total	Loch Lo-mond	Total Pro-duc-tion	To South Sys-tem	From South Sys-tem	To Felton Sys-tem	From Felton Sys-tem	Net Sup-ply	Paso-5A	Paso-6	Paso-7	Total	Mañ-ana Wds Well	Total Pro-duc-tion	To North Sys-tem	From North Sys-tem	Net Sup-ply	Fall Ck	Bull Ck	to Kirby WTP	as ground-water	Felton Acres Well	Total Pro-duc-tion[b]	To North Sys-tem	From North Sys-tem	Net Sup-ply	Pro-duced by SLVWD	All SLVWD Current Sources
	% avg	afy																																							
1977[a]	41%	-	-	-	-	-		-	400	-	-	350	-	-	-	350	1,100	-	-	-	-	1,100	-	-	-	160	-	160	-	-	160	-	-	-	-	-	-	-	-	-	1,260	-
1985	83%	-	-	706	103	128	231	4	941	185	122	422	167	-	214	0	1,576	-	-	-	-	1,576	-	-	-	204	-	204	-	-	204	-	-	-	-	-	-	-	-	-	1,781	-
1986	137%	-	-	629	109	111	220	16	865	240	106	421	115	-	171	0	1,457	-	-	-	-	1,457	-	-	-	214	-	214	-	-	214	-	-	-	-	-	-	-	-	-	1,671	-
1987	55%	-	-	333	111	89	200	36	569	240	156	496	362	-	421	0	1,486	-	-	-	-	1,486	-	-	-	224	-	224	-	-	224	-	-	-	-	-	-	-	-	-	1,710	-
1988	62%	-	-	305	100	72	172	24	500	252	131	516	336	-	405	0	1,421	-	-	-	-	1,421	-	-	-	229	-	229	-	-	229	-	-	-	-	-	-	-	-	-	1,650	-
1989	70%	-	-	419	116	85	201	27	647	175	91	349	306	-	348	0	1,344	-	-	-	-	1,344	-	-	-	263	63	263	-	-	263	-	-	-	-	-	-	-	-	-	1,607	-
1990	50%	-	-	526	73	80	153	14	693	151	65	268	348	-	370	0	1,330	-	-	-	-	1,330	-	-	-	265	74	265	-	-	265	-	-	-	-	-	-	-	-	-	1,595	-
1991	65%	-	-	347	72	53	125	30	501	223	89	348	363	121	515	0	1,364	-	-	-	-	1,364	-	86	6	276	-	276	-	-	276	-	-	-	-	-	-	-	-	-	1,640	-
1992	84%	-	-	501	83	66	150	21	671	169	57	261	357	106	466	0	1,398	-	-	-	-	1,398	-	4	260	301	-	301	-	-	301	-	-	-	-	-	-	-	-	-	1,698	-
1993	118%	-	-	647	105	101	206	16	870	123	39	188	204	133	338	0	1,395	-	-	-	-	1,395	-	31	269	310	-	310	-	-	310	-	-	-	-	-	-	-	-	-	1,705	1,705
1994	67%	-	-	466	117	135	252	11	729	151	87	291	348	150	501	0	1,521	-	-	-	-	1,521	-	41	252	308	-	308	-	-	308	211	160	127	0	20	498	-	-	498	1,829	2,328
1995	141%	-	-	956	35	56	91	0	1,047	108	41	161	269	15	285	0	1,493	-	-	-	-	1,493	-	96	271	376	-	376	-	-	376	94	137	184	0	25	414	-	-	414	1,869	2,283
1996	125%	-	-	1,105	0	12	12	0	1,117	126	55	181	200	146	347	0	1,645	-	-	-	-	1,645	-	111	275	386	-	386	-	-	386	51	157	213	1	22	420	-	-	420	2,031	2,451
1997	120%	-	-	873	81	61	143	0	1,118	111	76	187	305	126	431	0	1,735	-	-	-	-	1,735	-	167	263	430	-	430	-	-	430	0	173	202	6	9	351	-	-	351	2,165	2,516
1998	169%	781	102	883	186	94	280	0	1,163	105	32	137	180	14	194	0	1,494	-	-	-	-	1,494	-	183	152	336	63	336	-	-	336	47	135	209	6	0	366	-	-	366	1,829	2,195
1999	94%	700	147	847	196	152	349	0	1,196	122	1	123	246	23	269	0	1,588	-	-	-	-	1,588	-	204	201	406	76	406	-	-	406	87	143	214	7	0	419	-	-	419	1,994	2,413
2000	115%	524	133	657	188	192	380	0	1,037	110	37	147	227	216	443	0	1,628	-	-	-	-	1,628	-	225	209	434	74	434	-	-	434	145	128	212	9	0	489	-	-	489	2,062	2,551
2001	76%	409	149	558	206	144	350	0	908	57	158	215	275	234	509	0	1,632	-	-	-	-	1,632	-	183	264	447	68	447	-	-	447	261	82	137	7	0	487	-	-	487	2,079	2,567
2002	96%	688	144	832	62	41	103	0	935	160	124	283	264	179	444	0	1,662	-	-	-	-	1,662	-	230	203	433	68	433	-	-	433	244	94	140	6	0	484	-	-	484	2,095	2,579
2003	100%	598	150	748	107	72	180	0	928	177	155	332	268	158	426	0	1,685	-	-	-	-	1,685	-	230	207	436	66	436	-	-	436	224	100	139	8	0	470	-	-	470	2,122	2,592
2004	90%	523	140	663	135	91	226	0	889	210	159	369	275	205	481	0	1,739	-	-	-	-	1,739	-	290	138	428	60	428	-	-	428	254	87	129	10	0	481	-	-	481	2,167	2,648
2005	136%	682	121	803	191	127	318	0	1,121	205	152	357	205	89	294	0	1,772	-	-	-	-	1,772	-	292	49	341	59	341	-	-	341	144	98	174	9	0	424	-	-	424	2,113	2,538
2006	152%	686	129	815	179	119	299	0	1,114	171	158	329	246	111	357	0	1,800	-	-	-	-	1,800	-	261	111	372	31	403	-	-	403	113	127	184	9	0	432	-	-	432	2,203	2,635
2007	59%	291	106	397	223	149	371	0	768	270	178	461	321	233	554	0	1,783	-	-	-	-	1,783	-	247	141	389	51	440	-	-	440	221	104	101	9	0	435	-	-	435	2,223	2,658
2008	79%	403	48	451	156	104	260	0	712	219	129	348	307	214	522	0	1,581	-	-	-	-	1,581	-	264	126	390	51	441	-	-	441	187	114	90	11	0	402	-	-	402	2,079	2,425
2009	79%	363	49	411	163	109	272	0	684	151	111	262	315	226	541	0	1,486	-	-	-	-	1,486	-	258	109	367	43	410	-	-	410	234	75	82	8	0	400	-	-	400	2,297	2,297
2010	115%	603	86	689	155	103	258	0	947	78	93	171	266	32	297	0	1,415	-	-	-	-	1,415	-	245	86	331	39	371	-	-	371	214	92	86	6	0	399	-	-	399	2,185	2,185
2011	126%	577	224	801	196	131	326	0	1,128	96	50	146	123	6	129	0	1,403	-	-	-	-	1,403	-	287	74	361	24	385	-	-	385	168	121	129	7	0	426	-	-	426	2,213	2,213
2012	77%	482	76	558	166	111	276	0	834	192	36	228	268	129	397	0	1,460	-	-	-	-	1,460	-	258	90	348	37	386	-	-	386	190	96	106	7	0	399	-	-	399	2,244	2,244
2013	75%	361	143	504	172	115	287	0	791	178	91	269	283	196	478	0	1,538	-	-	-	-	1,538	0	291	94	385	7	392	-	-	392	246	56	96	7	0	405	-	-	405	2,335	2,335
2014	47%	203	49	253	101	68	169	0	421	198	140	339	387	185	572	0	1,332	-	-	-	-	1,332	37	231	73	337	19	355	-	-	355	266	17	66	5	0	354	-	-	354	2,042	2,042
2015	70%	278	47	325	124	85	209	0	534	175	89	264	298	69	367	0	1,164	-	-	-	-	1,164	93	134	73	300	12	311	-	-	311	234	47	29	7	0	317	-	-	317	1,793	1,793
2016	95%	405	71	476	162	114	276	0	753	155	84	239	234	57	291	0	1,283	12	6	1	0	1,275	123	88	41	252	0	252	6	12	259	165	98	53	8	0	323	0	1	324	1,858	1,858
2017	193%	928	115	1,042	22	15	37	0	1,080	137	80	217	158	29	187	0	1,484	82	10	20	0	1,391	237	0	0	237	0	237	10	82	309	110	77	128	8	0	324	0	20	344	2,044	2,044
1985-2017 Avg	98%	524	111	622	127	97	224	6	855	164	96	283	267	126	381	-	1,518	47	8	11	0	1,515	98	183	150	337	45	346	8	47	349	171	105	135	7	3	413	0	11	414	1,968	2,324
1985-2017 Min	47%	203	47	253	0	12	12	0	421	57	1	123	115	6	129	-	1,164	12	6	1	0	1,164	0	0	0	204	0	204	6	12	204	0	17	29	0	0	317	0	1	317	1,595	1,705
1985-2017 Max	193%	928	224	1,105	223	192	380	36	1,196	270	178	516	387	234	572	-	1,800	82	10	20	0	1,800	237	292	275	447	76	447	10	82	447	266	173	214	11	25	498	0	20	498	2,335	2,658
2000-2017 Avg	99%	500	110	610	150	105	255	0	866	163	112	276	262	143	405	-	1,547	47	8	11	0	1,541	98	223	116	366	39	384	8	47	388	201	90	116	8	0	414	0	11	415	2,120	2,345
2000-2017 Min	47%	203	47	253	22	15	37	0	421	57	36	146	123	6	129	0	1,164	12	6	1	0	1,164	0	0	0	237	0	237	6	12	259	110	17	29	5	0	317	0	1	317	1,793	1,793
2000-2017 Max	193%	928	224	1,042	223	192	380	0	1,128	270	178	461	387	234	572	0	1,800	82	10	20	0	1,800	237	292	264	447	74	447	10	82	447	266	128	212	11	0	489	0	20	489	2,335	2,658

Apparent partial record.

Not part of SLVWD.

- No or partial record.

afy Acre-feet per year

% avg Percent of average, WYs 1970-2017 (WYs 1970-74 estimated).

WY Water year, e.g., WY 2017 was from October 1, 2016 to September 30, 2017.

[a] WY 1977 is for July 1976 through June 1977; WY 1984 only partial-year record.

[b] Adjusted for WTP bypass flows.

Table 3-1
SLVWD Historical Water Production, WYs 1977 and 1985–2017

Water Source			Month and Amount of Highest Ranked Rates of Monthly Water Production for Period of Record[a] (gpm)																			
		Rank:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
North System	**Stream Diver-sions**	Foreman Creek	Mar-17 926	Apr-17 921	Apr-99 857	Apr-06 855	Jan-06 813	May-06 780	Mar-98 772	Mar-05 769	Apr-04 765	May-17 758	Feb-00 756	Jan-05 742	Mar-99 739	Apr-98 738	May-98 730	Feb-99 724	Feb-08 718	Mar-10 700	Mar-06 700	Feb-05 697
		Peavine Creek	Apr-97 270	May-97 249	Sep-17 230	Jun-97 214	Jul-11 208	Jan-13 202	Jun-99 197	Jun-11 185	Jul-99 172	May-11 171	Jan-11 169	Feb-13 167	Apr-01 158	Aug-11 158	Apr-11 157	Oct-17 155	Jul-97 154	Aug-99 152	Aug-98 147	Feb-06 144
		Foreman & Peavine Cks	Mar-17 926	Apr-17 921	May-17 881	May-06 867	Apr-99 866	Apr-06 861	Mar-05 829	Jan-06 823	Jun-96 821	Jan-05 815	Apr-04 815	Jul-95 810	Jul-96 805	Mar-97 805	May-95 796	Apr-96 795	Apr-95 784	Mar-96 783	Apr-02 783	Feb-97 778
		Clear Creek	Jul-98 302	Jun-99 277	Jul-06 268	May-00 258	Jun-10 249	Aug-11 241	Jul-11 237	Mar-07 235	Aug-98 231	Jun-06 230	Jun-00 228	Jul-10 223	Apr-08 221	Jun-05 221	Jun-98 213	Aug-06 213	May-01 211	Feb-88 206	Apr-09 204	Apr-16 202
		Sweetwater Creek	May-00 258	Jun-00 228	Jul-00 194	Jul-06 179	Aug-98 172	Aug-00 171	Jun-10 166	Aug-11 161	Jul-11 158	Mar-07 157	Jun-84 156	Sep-98 154	Jun-86 153	Jun-06 153	Jul-99 149	Jul-10 149	Apr-08 148	Jun-05 147	Aug-99 145	May-84 144
		5-Mile Pipeline[B]	May-00 515	Jun-00 457	Jul-06 447	Jun-99 416	Jun-10 416	Aug-98 403	Aug-11 402	Jul-11 395	Mar-07 392	Jul-00 388	Jun-06 383	Jul-98 381	Jul-10 372	Apr-08 369	Jun-05 368	Aug-06 354	May-01 352	Aug-00 343	Apr-09 340	Apr-16 337
		Lyon WTP	May-06 983	Jul-11 963	May-05 947	Mar-17 926	Apr-17 921	Jun-10 908	Jun-06 908	Jun-11 906	Jun-05 904	Mar-07 892	Feb-05 889	May-17 881	Mar-05 881	May-11 877	Apr-05 873	May-16 864	Apr-06 861	May-12 845	Jan-06 838	Apr-08 835
	Ground-water Wells	QH-4 & -4A	Jul-05 362	May-13 331	Jun-86 302	Jul-86 299	May-91 281	Nov-08 270	Aug-86 255	Sep-03 252	Jul-06 239	Sep-85 234	Sep-10 231	Sep-07 229	Jun-06 225	Jun-07 224	Jun-87 224	Aug-08 223	Jul-04 223	Jul-07 223	Aug-07 222	Jul-87 221
		QH-5 & -5A	Jul-05 183	Oct-84 182	Jul-06 182	Jan-87 181	Jul-03 181	Jul-04 177	Aug-03 175	Jun-01 173	Sep-03 172	Oct-02 168	Oct-03 167	May-01 166	Jul-08 164	Jun-07 164	Aug-04 162	Jun-06 161	Aug-08 160	Sep-04 159	Aug-02 158	Sep-02 157
		Quail Hollow (QH) wells total	Jul-05 545	Aug-84 523	Jul-86 511	Aug-87 511	Jul-87 504	Oct-84 496	Jun-87 493	Aug-85 472	Sep-85 468	Jun-86 468	Jun-85 460	Jul-84 460	Sep-87 451	Aug-86 450	Sep-84 441	Aug-88 430	Jul-88 430	Sep-03 424	Jun-84 422	Jul-85 422
		Oly-2	Aug-87 494	Jul-88 482	Aug-88 473	Jul-89 465	Sep-88 459	Aug-89 449	Jul-84 444	Jun-90 443	Sep-90 443	Oct-90 439	Sep-84 436	Sep-87 436	Jul-13 434	Aug-90 430	Sep-93 426	Aug-08 417	Jul-90 406	Jul-97 406	Feb-91 400	Aug-85 397
		Oly-3	Jul-93 429	Aug-96 423	Sep-96 403	Oct-96 390	Aug-94 386	Jun-91 360	Jun-07 357	Jul-07 353	Sep-01 352	Jun-01 350	Aug-03 349	Aug-08 346	Sep-03 345	Aug-02 345	Jul-01 343	Sep-12 341	Aug-01 337	Aug-07 336	Sep-94 323	Aug-12 320
		Olympia (Oly) wells total	Aug-94 779	Aug-08 763	Jul-13 734	Aug-02 713	Jun-07 712	Jul-07 711	Sep-01 708	Aug-03 704	Sep-03 702	Jun-01 702	Aug-07 696	Jul-01 689	Aug-01 680	Sep-94 659	Aug-04 654	Sep-12 649	Sep-04 646	Jul-02 645	Jul-94 644	Sep-07 642
South System	**Ground-water Wells**	Paso-5A	Jun-17 276	May-17 251	Oct-17 246	Aug-17 230	Sep-16 223	Jul-17 209	Dec-17 197	Feb-18 191	Oct-16 188	Nov-17 188	Nov-16 164	Sep-17 159	Jan-18 156	Jul-16 156	Aug-16 144	Mar-18 131	Dec-14 111	Jan-15 109	Feb-15 101	Sep-14 99
		Pasatiempo 6	Aug-05 286	Jul-04 281	Jul-05 280	Jun-04 260	Jul-06 249	Sep-04 248	Sep-05 246	Jul-09 245	Jun-05 244	Apr-04 244	Oct-05 244	Jul-13 242	Jun-13 241	May-04 240	Jul-10 240	Sep-13 240	Aug-08 239	Jul-03 238	Aug-09 235	Jul-11 235
		Pasatiempo 7	Aug-92 279	Sep-92 259	Apr-95 258	Jul-95 256	Jun-96 256	May-01 248	May-02 243	Jul-96 241	Aug-95 240	Sep-95 239	Jul-93 237	Mar-95 229	Jun-95 228	May-97 228	Apr-97 225	May-93 223	Jul-92 222	Aug-96 213	Aug-93 213	May-96 212
		Pasatiempo wells total	May-01 435	Jul-00 422	Jul-03 420	May-02 408	Jul-99 405	Aug-03 399	Jun-01 396	Jul-06 388	Aug-02 388	Jul-97 386	Jul-02 382	Jun-02 378	Jul-95 376	Aug-98 368	May-97 368	Aug-00 364	Aug-97 363	Jul-01 362	Jul-04 360	Jun-97 356
Felton System	**Stream and Spring Diver-sions**	Fall Creek	Sep-13 278	Aug-03 261	Jul-13 255	Jul-03 254	Jul-01 254	Jun-01 252	Sep-03 247	Jun-12 247	Jul-07 244	Jul-12 243	Aug-04 241	Jun-13 240	Aug-13 240	Jul-04 240	May-13 237	Aug-01 234	Aug-12 232	Sep-02 229	Jun-07 229	Jul-94 227
		Bennett Spring (to WTP)	Apr-17 199	Apr-00 176	Jul-98 175	Apr-99 173	May-99 172	Jun-98 170	Aug-07 165	Jun-99 164	Jan-17 163	Aug-98 163	Jun-06 162	Mar-99 162	May-06 159	May-00 159	Jun-95 159	Jul-95 158	Feb-99 157	Apr-96 157	Mar-98 156	Jun-96 154
		Bull Creek	Jan-94 226	Jan-93 168	Apr-97 166	Feb-95 158	Mar-93 155	May-97 154	Feb-93 150	Jun-96 146	Jun-93 144	Jun-97 141	Dec-93 141	Feb-16 138	Sep-93 137	Mar-97 136	Feb-08 136	Apr-11 135	Jan-06 133	May-99 133	Mar-11 132	Jul-96 131
		Kirby WTP	Jun-01 424	Jun-02 412	Jul-00 412	Jul-02 403	Jul-03 402	Aug-00 401	Jun-00 400	Aug-03 400	Jul-01 385	Jul-06 377	Jun-04 372	Sep-02 372	Jun-03 372	Aug-01 370	Aug-04 365	Jul-04 364	Sep-03 364	Jul-05 362	Aug-02 362	Aug-05 362
		Bennett Spring 2-inch line	Apr-08 13.4	Jun-17 10.8	Aug-08 10.1	Jul-08 10.0	Jun-00 9.7	Jun-08 9.7	Jul-07 9.2	Jun-07 9.1	Dec-08 8.7	Jun-12 8.6	Jun-04 8.3	Jul-17 8.2	Aug-04 8.2	Aug-11 8.2	Jul-04 8.1	Dec-15 8.1	May-00 8.1	Jun-09 8.0	Dec-03 8.0	Jul-03 8.0

[a] See Table 1-1 for periods of record.
[b] 5-mile pipeline is the conveyance for Clear and Sweetwater Creek diversions.

gpm gallons per minute; equivalent continuous monthly rate.
WTP water treatment plant

Table 3-2
SLVWD Highest Ranked Monthly Rates of Water Production

System	Water Source		Design, Maximum, and Planned Capacities				Raw-Water Conveyance	Design, Maximum, and Planned Capacities			
			afm	gpm	cfs	note		afm	gpm	cfs	note
North	Diver-sions	Foreman Ck	125	926	2.06	a	Peavine line (to Foreman mixing vault)	36	270	0.60	g
		Peavine Ck	36	270	0.60	a					
		Foreman & Peavine Cks	161	1,196	2.66	b	5-mile pipeline (Clear & Sweetwater diversions to Foreman mixing vault)	74	550	1.23	e
			125	926	2.06	c		69	515	1.15	a,f
		Clear Ck	41	302	0.67	a,d		54	400	0.89	i
		Sweetwater Ck	35	258	0.57	a,d	Foreman line (all diver-sions to Lyon WTP)	148	1,100	2.45	e
		Clear & Sweetwater Cks	75	560	1.25	b,c		138	1,030	2.29	c
								222	1,650	3.68	j
		Total diversions	236	1,755	3.91	b	Quail Hollow & Olympia wells	198	1,468	3.27	b
	Wells	QH-4 or QH-4A	49	362	0.81	a		155	1,150	2.56	c
		QH-5 or QH-5A	25	183	0.41	a	**WaterTreatment** Lyon WTP				
		Quail Hollow total	73	545	1.21	b,c		148	1,100	2.45	e
		Oly-2	66	494	1.10	a		135	983	2.19	a
		Oly-3	58	429	0.96	a		126-130	940-970	2.10	g
		Olympia total	124	923	2.06	b		222	1,650	3.68	j
			105	779	1.74	c					
Felton	Diver-sions	Fall Ck	37	278	0.62	a	**WaterTreatment** Kirby WTP	94	700	1.56	e
		Bennett Sp (to WTP)	27	199	0.44	a		57	424	0.95	a,l
		Bennett Sp 2-inch line	1.8	13.4	0.03	a		47	350	0.78	g,k
		Bull Ck	31	226	0.50	a		141	1,050	2.34	j
		Total diversions	96	712	1.59	b					
			61	459	1.02	c					
South	Wells	Pasatiempo 5A	37	276	0.62	a					
			47	350	0.78	g					
		Pasatiempo 6	38	286	0.64	a,x					
		Pasatiempo 7	38	279	0.62	a					
		Pasatiempo 8	-	-		h					
		Pasatiempo wells total	77	576	1.28	b					
			60	435	0.97	c					
		Manana Woods	11	80	0.18	a,x					
Intertie Capacities		North-South	20	150	0.33	g,m					
			40	300	0.67	g,n					
			74	550	1.23	g,j					
		North-Felton	20	150	0.33	g,m					
		Felton-South (via North)	20	150	0.33	g,m					
		South-SVWD	47	350	0.78	g,m					
		Felton-South direct	-	-	-	j					

Notes:

a Equivalent continuous rate for maximum month of record.*
b Equivalent continuous rate for sum of maximum months.*
c Equivalent continuous rate for maximum of monthly sums.*
d Approximate apportionment.
e Design capacity (as reported). * from Table 3-1
f Maximum month occurs in spring.
g R. Rogers/SLVWD, personal communication, April-May, 2018.
h Under construction.
i As tested February-March 2006.
j Planned or potential.
k Capacity as commonly used.
l 1993, first year of record.
m Current.
n Expected near term.
x Inactive.

Abbreviations:

afm acre-feet per month
cfs cubic feet per second
ck creek
gpm gallons per minute
sp spring

Table 3-3
Design, Maximum-Monthly, and Planned Capacities of SLVWD Diversions, Wells, Conveyance, and Treatment Facilities

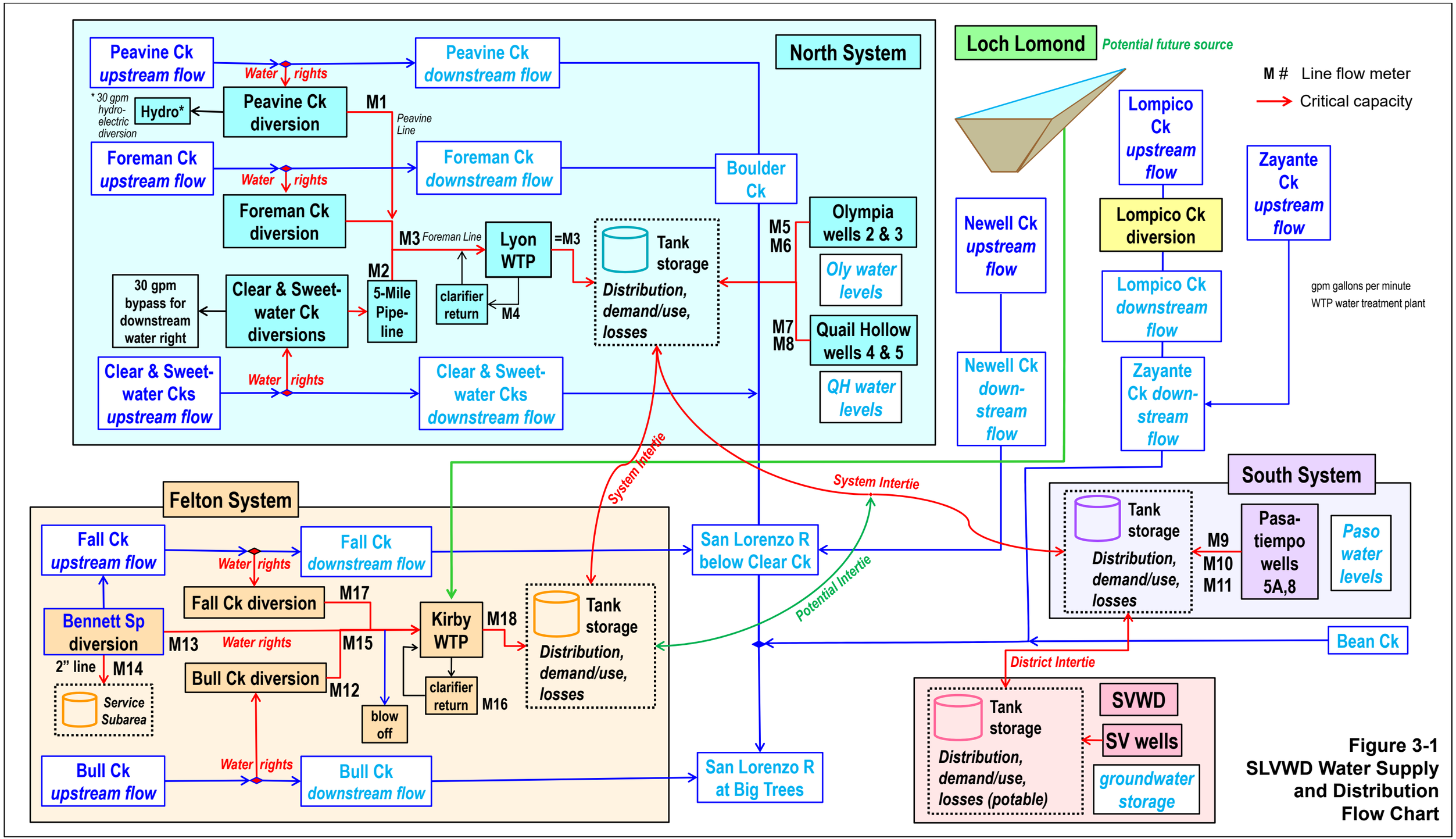


Figure 3-1
SLVWD Water Supply and Distribution Flow Chart

4 Surface Water Resources

Figure 1-2 shows the location of SLVWD's diversion watersheds and Table 4-1 provides diversion intake elevations, watershed drainage areas, and estimated watershed average precipitation. SLVWD's diversion watersheds have a combined area of approximately 4,310 acres, or 7.1 square miles (mi^2), equal to 6.3 percent of the San Lorenzo River watershed above the USGS SLRBT gauge. Additionally:

- Diversions on Peavine and Foreman creeks have a combined watershed area of 710 acres, equal to about 10 percent of the Boulder Creek watershed above its confluence with the San Lorenzo River.
- Diversions on Clear and Sweetwater creeks have a combined watershed area of 660 acres, about 2 percent of the San Lorenzo River watershed above its confluence with Clear Creek.
- The Fall Creek diversion has a watershed area of approximately 2,770 acres (4.3 mi^2), including the 225-acre watershed above the Bennett Spring diversion.
- The two Bull Creek diversions have a combined watershed area of 175 acres.
- The Fall, Bennett, and Bull Creek diversion watersheds compose 4.3 percent of the San Lorenzo River watershed above the Big Trees gauge.

The potential yields of SLVWD diversions are constrained by water rights and existing and potential bypass flow requirements (Section 4.1), and by the seasonal and year-to-year variability of divertible flows (Section 4.2) relative to existing and potential diversion capacities (Section 3).

4.1 Water Rights and Bypass Flow Requirements

This section describes SLVWD's stream and spring diversion water rights.

4.1.1 North System Diversion Streams

SLVWD has pre-1914 appropriative rights to divert water from Peavine, Foreman, Clear, and Sweetwater creeks, which has allowed it to supply water from these streams to its North system without restriction (Table 4-2). SLVWD has an agreement with a downstream water user to allow 30 gpm to bypass its Clear Creek diversion at all times. SLVWD's legal right to transfer potential available diversions outside the North system should be verified.

4.1.2 Felton System Diversion Streams

SLVWD has a permitted appropriative right to divert from Fall and Bull creeks and Bennett Spring to supply water to its Felton system (Table 4-3). The right is limited to a total diversion rate of 1.7 cfs and total annual diversions of 1,059 afy. Additionally, Fall Creek required bypass flows are defined separately for dry and non-dry years, and diversions are not permitted from any Felton source during defined low-flow conditions. Dry-year and low-flow conditions are defined in terms of the gauged flow of the San Lorenzo River at Big Trees.

The water rights permit defines Fall Creek bypass flows as follows:

Dry years:	0.75 cfs November 1–March 31
	0.50 cfs April 1–October 31
Other years:	1.5 cfs November 1–Mar 31
	1.0 cfs April 1–October 31

Dry years are triggered when SLRBT cumulative monthly flows are less than the following amounts:

October:	< 500 af
October–November:	< 1,500 af
October–December:	< 5,000 af
October–January:	< 12,500 af
October–February:	< 26,500 af

Table 4-4 identifies dry and non-dry years for the SLRBT record since WY 1970. Dry years are triggered during 46 percent of all years.

Table 4-4 also identifies low-flow months since WY 1970 based on SLRBT monthly average flows below the permit thresholds. Diversions are not permitted from any of the Felton system sources during low-flow conditions when SLRBT flows are less than the following amounts:

October:	25 cfs
November–May:	20 cfs
September:	10 cfs

On an average monthly flow basis, low-flow conditions have occurred 11 percent of all months during WYs 1970–2017, nearly 50 percent of which occurred in October, with the remainder mostly in November (17 percent), September (13 percent), and May (10 percent). Because low-flow criteria are applicable on a daily basis, this is likely an under estimate of the number of months during which non-compliant diversions occur.

Finally, use of the water produced from Felton system diversions is permitted only within the Felton service area. Use of an existing or potential intertie between the Felton system and one or more other systems would require modification of the water right permit.

4.1.3 Loch Lomond Reservoir

In 1958, SLVWD sold 2,500 acres encompassing a portion of the Newell Creek watershed to the City of Santa Cruz with the agreement that SLVWD would be entitled to purchase 12.5 percent of the annual safe yield from a reservoir planned by the city. The city created Loch Lomond Reservoir with the completion of Newell Creek Dam in 1960. The reservoir has a drainage area of 8.3 mi^2 and a reservoir capacity of approximately 9,000 af. The city's appropriative right allows a maximum direct diversion of 3,200 afy and a maximum use of 5,600 afy.

SLVWD began receiving a portion of the reservoir yield after the dam was completed, although records are only available for 1976–77, when it received 353 af. SLVWD has not received any water from Loch Lomond since 1977. Since implementation of the Federal 1989 Surface Water Treatment Rule, SLVWD has not had the means to treat diversions from Loch Lomond. In 1996 the City and SLVWD reached a draft agreement that allows SLVWD to purchase up to 313 afy of raw Loch Lomond water, or purchase the same amount of treated city water with the understanding that it would be interruptible during declared water-shortage emergencies (Kocher 1996). SLVWD has yet to exercise either allowance under this agreement. To exercise its allotment, SLVWD may need to connect to the City's raw water line and expand the Kirby WTP (SPH Associates 2010).

4.2 Method for Estimating Total and Divertible Flows

SLVWD has maintained a monthly record of the water it diverts from each stream since WY 1985 and began gauging the total or remaining flow of these streams in WY 2013 (Table 1-1). These data are insufficient for estimating potential diversions under a variety of conditions. This section presents the approach Exponent used to estimate total and potentially divertible flows under alternative infrastructure, operational, and water rights assumptions.

To estimate SLVWD's potentially available diversions and flows downstream of its diversions, Exponent synthesized monthly flow records representative of the WY 1970–2017 climatic cycle. The monthly flow estimates are derived from monthly probability curves of mean daily flow ("flow duration curves") for representative dry and wet years. Flow duration curves were also developed for SLRBT and Boulder Creek to synthesize equivalent records for use evaluating Felton water-rights restrictions and estimating the significance of diversions on downstream flows.

Figure 4-1 is a schematic illustration of a flow duration curve and its use to estimate the volume of divertible flows. A flow duration curve is a cumulative probability curve defined for some period (e.g., a water year or a month of the year) representing the percent of time mean daily flows are greater than flow rates indicated along the y-axis. The area under the curve represents the total volume of flow for the defined period. As illustrated in Figure 4-1, potentially

divertible flows may be estimated as the portion of the area below the curve bounded at the low end by required minimum bypass flows and at the high end by diversion capacities and limitations associated with high flows (elevated turbidity and the potential for storm damage).

This approach allows for a more accurate evaluation of diversion capacities, water rights, and bypass flow requirements than previous studies that used monthly timesteps without accounting for the variability of daily flows (HEA 1983; Geomatrix 1999; Johnson 2009, 2015, 2016). The 1983 and 1999 studies estimated mean monthly flows based on correlations with the SLRBT and other gauged records, whereas the latter studies estimated potentially divertible monthly flows by extrapolating the diversion record while assuming no changes in infrastructure or water rights.

This study uses the SLRBT record to assign each year of the WY 1970–2017 climatic cycle to one of 14 increments between the driest and wettest years, labeled "A" through "N," respectively (Table 4-5). Each increment represents an interval of 20 percent of average annual flow within an overall range of 10 to 320 percent of average. Estimated total and divertible monthly flows are calculated for each category using a weighted average monthly flow duration curve interpolated between the driest and wettest conditions.

Information used to develop flow duration curves for SLVWD's diversion streams includes:

- Watershed area, estimated average precipitation, and average runoff estimated from average precipitation (e.g., Geomatrix 1999).
- Flow duration curves calculated for the USGS WY 1970–1985 gauged record of San Vicente Creek, which has watershed conditions similar to SLVWD's diversion watersheds in terms of location, elevation, precipitation, geology, and streamflow hydrograph with sustained baseflows (Figure 1-4; Johnson 2009).
- SLVWD diversion records, which provide a lower bound for estimating total streamflow.

- Continuous gauging records for SLVWD diversion streams during portions of WYs 2013–2017 (Balance Hydrologics 2018). This period was characterized by extreme drought (WYs 2012–2015) followed by extreme precipitation (WY 2017) and thus may not be representative of more typical conditions. Except for the gauging station installed immediately upstream of the Fall Creek diversion, these records exclude flows diverted by SLVWD. Based on reported monthly average rates of water production, SLVWD's diversions must be added to the daily flow record before calculating the flow duration curves used to support this analysis.

Figures 4-2 and 4-3 present monthly flow duration curves derived from the driest and wettest years, respectively, of the USGS gauged record for San Vicente Creek near Davenport. Although slightly smoothed for plotting, the shapes of these curves are difficult to interpret in light of statistical noise associated with too short a gauging record (Table 4-5).

The units of the y-axis of these plots, and all flow duration curves presented in the remainder of this report, are in cubic feet per second per square mile (cfs/mi^2). Flow duration curves expressed in these units are easily compared between different watersheds and data sets.

Figures 4-4 and 4-5 present monthly flow duration curves for the driest and wettest years derived from SLVWD's combined record of Foreman and Peavine Creek diversions. This study used these and similar curves derived for each SLVWD diversion to interpret the lower limits of monthly flow.

The flow duration curves used in this study and presented in the remainder of this section were calibrated (adjusted) to reproduce SLVWD's historical record of diversions during WYs 2000–2017 (see Section 6-1). The calibration was most sensitive to seasonal and drought low-flow periods and poorly constrained by the available information for high flows. Thus, the results of this analysis are suitable for estimating divertible flows and flows remaining downstream of diversions during dry and average conditions but should not be used to support estimates of peak or total annual flow given a greater potential for errors.

4.3 Estimated Flow Duration Curves

Figures 4-6 and 4-7 present sets of monthly flow duration curves for SLRBT representative of the driest and wettest years, respectively, during WYs 1970–2017. These curves represent the impaired flow conditions of the historical record. In comparison to the historical record, Table 4-6 summarizes the monthly and annual SLRBT flows synthesized using weighted averages of these curves interpolated for each of the 14 intervals of annual flow defined in Table 4-5. To be consistent with dry-year designations defined by Felton water rights (Table 4-3), simulated monthly flows were exchanged among categories "A" through "N" (Section 4.2) some years as needed to represent later starts to the wet season. The bar charts presented in Figure 4-8 show a reasonably good fit between synthesized and gauged SLRBT annual flows and average monthly flows.

As shown in Figure 4-9, synthesized and gauged monthly flow hydrographs for WYs 1970–2017 match reasonably well for low to moderate flow conditions, consistent with the calibration approach discussed above. Although the synthesized hydrograph underestimates peak annual flows most years, potential errors associated with flows many times greater than diversion capacities are relatively inconsequential to the results of this study.

The wet- and dry-year monthly flow duration curves presented in Figures 4-10 and 4-11 were derived in a similar manner for Boulder Creek using the USGS WY 1977–1993 gauging record. Figure 4-12 shows a reasonably good fit between synthesized and gauged Boulder Creek annual flows and average monthly flows, and the bottom plot in Figure 4-9 shows a similarly good fit to the WY 1970–2017 hydrograph of monthly gauged flows. Similar to the synthesized record for SLRBT, these curves represent flows impaired by SLVWD and other upstream diversions.

Figures 4-13 and 4-14 are monthly flow duration curves for Foreman Creek representative of the driest and wettest years, respectively, developed using the approach and information discussed above. In the case of these and SLVWD's other diversion streams, these curves represent unimpaired flows at the point of diversion. Figures 4-15 and 4-16 present similar sets of curves for Peavine Creek, and Figures 4-17 and 4-18 present the monthly flow duration curves for Clear and Sweetwater creeks combined. The Clear and Sweetwater Creek diversion

watersheds are treated as one source given their diversion records are essentially combined; the diversions reported for each stream are typically estimated as a fixed percentage of the total diversion conveyed by the 5-mile pipeline.

Sets of monthly flow duration curves representative of the driest and wettest years are presented in Figures 4-19 and 4-20 for the combined monthly flows of Fall and Bennett creeks. Although each stream has separate diversions, Bennett Creek is a sub-watershed within the Fall Creek watershed such that its non-diverted flows contribute to total flow at the Fall Creek diversion. Thus, it was reasonable to develop sets of monthly flow duration curves only for the entire watershed above the Fall Creek diversion. Figures 4-21 and 4-22 present similarly derived sets of curves for the watershed above SLVWD's Bull Creek diversion.

Based on the SLRBT daily flow duration curves presented in Figures 4-6 and 4-7, Figure 4-23 provides plots of the estimated percent of time SLRBT flows are above the minimum thresholds required for permitted Felton diversions (Table 4-3). For example, these plots show that during the driest years, flows permitted for diversion occur less than 10 percent of the time during October and no more than 30 percent of the time during September to May. Exponent used these curves to help evaluate permitted Felton diversions on a statistically daily basis for the alternative conjunctive use scenarios presented in Section 6.

4.4 Low-Flow Records of Streams Potentially Effected by Groundwater Pumping

Tables 4-7 through 4-10 are a compilation of continuously gauged flows and intermittent low-flow measurements for streams potentially effected by SLVWD groundwater pumping, expressed in units of equivalent acre-feet per month (afm). Specifically, these tables provide flows for the following streams and periods of record:

Table 4-7. Selected San Lorenzo River Low-Flow Measurements at Stations between Brookdale and Felton, WYs 1986–2017

Table 4-8. Selected Newell Creek Low-Flow Measurements and Estimates, WYs 1974–2016

Table 4-9. Zayante Creek at Zayante Continuous Gauged Flow and Selected Low-Flow Measurements, WYs 1958–2016

Table 4-10. Selected Zayante Creek and Lompico Creek Low-Flow Measurements, WYs 1986–2017

The tables highlight selected minimum drought flows when the effects of groundwater pumping are potentially most significant. This information is used to support an evaluation of the potential effects of groundwater pumping under current conditions (Section 5.2) and alternative conjunctive use scenarios (Section 6).

Based on these records, impaired stream baseflows representative of worst drought conditions are approximated as follows for the purposes of this study:

	afm
San Lorenzo River between Brookdale and Felton	150
Newell Creek at San Lorenzo River	6
Lompico Creek	0
Zayante Creek at Zayante	1
Zayante Creek above Bean Creek	20
Bean Creek at Mount Hermon Bridge	80
Bean Creek at Zayante Creek	110
Zayante Creek at San Lorenzo River	130
San Lorenzo River at Big Trees (SLRBT)	400

Figure 4-24 is a map showing the distribution of these estimated minimum stream baseflows in relation to SLVWD, MHA, and SVWD production wells.

Watershed		Elevation: At Intake or Gage (ft msl)	Elevation: Water-shed Max. (ft msl)	Approximate Areas: Above Intake or Gage (ac)	Above Intake or Gage (mi^2)	Above Con-fluence with Next-Named Stream[a] (ac)	Above Con-fluence with Next-Named Stream[a] (mi^2)	Diversion Watershed as % of: Above Confluence[a]	Diversion Watershed as % of: Bould-er Ck at SLR	Diversion Watershed as % of: SLR above Clear Ck	Diversion Watershed as % of: SLR at Big Trees	Estimated Average Precip-itation (in/yr)[h]
North System Diversions												
Peavine Creek		1,264	2,610	230	0.36	285	0.45	81%	3.2%	0.7%	0.3%	60
Foreman Creek[b]		927	2,610	480	0.75	580	0.91	83%	6.6%	1.4%	0.7%	
Boulder Ck watershed total		-	-	710	1.11	865	1.35	82%	10%	2.0%	1.0%	
Clear Creek	intake 1	1,378	2,610	360	0.56	1,050	1.64	34%	-	1.0%	0.5%	60
	intake 2	1,350		55	0.09			5.2%	-	0.2%	0.08%	
	intake 3	1,350		20	0.03			1.9%	-	0.06%	0.03%	
Sweetwater Creek		1,350		225	0.35			21%	-	0.6%	0.3%	
Clear Ck watershed total		-	-	660	1.03			63%	-	1.9%	1.0%	
North system total		-	-	1,370	2.14	1,915	2.99	72%	-	3.9%	2.0%	-
Felton System Diversions												
Fall Creek		352	2,300	2,770	4.33	3,155	4.93	88%	-	-	4.1%	56
Bull Creek 1 and 2[c]		800	1,680	175	0.27	455	0.71	38%	-	-	0.3%	51
Bennett Spring[c]	2-inch line[d]	875	1,600	225	0.35	285	0.45	79%	-	-	0.3%	53
	to Kirby WTP	810										
Felton system total[e]		-	-	2,940	4.95	3,895	6.09	81%	-	-	4.3%	-
SLVWD total		-	-	4,310	7.09	5,810	9.08	78%	-	-	6.3%	-
Boulder Creek and San Lorenzo River												
Boulder Ck at Boulder Creek[f]		430	2,650	7,300	11.4	-	-	-	100%	21%	11%	53
San Lorenzo R. above Clear Ck[g]		370	3,230	35,100	54.8	-	-	-	-	100%	51%	46
San Lorenzo R at Big Trees[f]		220	3,230	68,200	106.6	-	-	-	-	-	100%	46

Notes:

[a] Next-named streams: Boulder Ck for Peavine & Foreman Cks; SLR for Clear, Fall, & Bull Cks; Fall Ck for Bennett Sp.

[b] Included minor contribution from Silver Creek diversion (30 ac watershed) prior to 2007.

[c] Groundwater recharge areas contributing to springs may differ from watershed areas above intakes.

[d] Portion of Bennett Spring diversion supplied as groundwater.

[e] Bennett Spring is within the Fall Creek watershed.

[f] USGS gauged watershed.

[g] Portion of San Lorenzo River watershed upstream and including all current SLVWD North System diversions (not gaged).

[h] Geomatrix (1999).

Abbreviations:

ac	acres
ft msl	feet above mean sea level
in/yr	inches per year
mi^2	square miles
SLR	San Lorenzo River

Table 4-1
SLVWD Diversion Watersheds

Stream	Year of First Use[a]	Statement of Diversion	Initial Filing Date	Stream Code	Point of Diversion	Tributary to:
Foreman Creek	1905	S008670	1/1/76	301109060	NW 1/4 of NE 1/4 Sec 25, T9S, R3W	Boulder Creek
Peavine Creek	1905	S008669	1/1/76	301109040	SW 1/4 of SW 1/4 Sec 24, T9S, R3W	Boulder Creek
Clear Creek[b]	1905	S008416	1/1/74	301111000	NW 1/4 of SE 1/4 Sec 31, T9S, R3W	San Lorenzo R
Sweetwater Ck	1905	S008671	1/1/76	301111008	SW 1/4 of SE 1/4 Sec 31, T9S, R2W	Clear Creek

[a] Pre-1914 appropriative rights.

[b] 30 gpm bypass required for downstream user.

Source: http://www.waterrights.ca.gov/

Table 4-2
SLVWD North System Active Water Rights

Ck creek
R river
SLRBT San Lorenzo River USGS gauge at Big Trees

Permit for Diversion and Use of Water, Division of Water Rights

Applicant: Citizen Utilities Company
Water Sources: Fall and Bull Creeks and Bennett Spring

Application No.: 24652 filed: 7/26/1974
Permit No.: 20123 issued: 8/3/1987

Section 5: Beneficial use not to exceed (all sources):

Total Diversion Rate			Total Annual Diversion		
cfs	*mgd*	*afm*	afy	*mgy*	*cfs*
1.7	*1.1*	*103*	**1,059**	*345*	*1.46*

Section 12: Required Fall Creek bypass flows (bypass all natural flow if less):

	Non-Dry Years		Dry Years*	
	cfs	*afm*	cfs	*afm*
April-October	**1**	*60*	**0.5**	*30*
November-March	**1.5**	*91*	**0.75**	*45*

* Dry year triggered when cumulative monthly SLRBT flows are less than:

	af
October	500
October-November	1,500
October-December	5,000
October-January	12,500
October-February	26,500

SLRBT gaging record corrected for City Santa Cruz diversions at Felton Weir.

Section 13: No diversions (all sources) if flow of San Lorenzo River at Felton Diversion Weir is less than:

	cfs
September	10
October	25
November-May	20

Section 20: Daily maximum total diversion rate:

cfs	*afm*
1.87	*113*

Bold indicates values from permit, *italics* indicate calculated, equivalent values.

af	acre-feet	cfs	cubic feet per second
afm	acre-feet per month	mgd	million gallons per day
afy	acre-feet per year	mgy	million gallons per year

Table 4-3
SLVWD Felton System Diversion Rights

Source: copy of cited permit.

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Percent of Average	
	afm												afy		
1970	1,998	1,845	11,301	49,534	14,701	23,273	6,218	4,015	2,565	1,549	1,451	1,154	119,605	130%	
1971	1,199	7,599	21,594	9,869	4,204	7,163	4,481	2,810	1,827	1,420	941	839	63,946	70%	
1972	922	1,505	6,462	3,363	4,044	1,826	1,964	1,224	803	639	561	649	23,963	26%	111%
1973	1,986	13,412	3,314	37,446	63,035	27,756	7,010	3,812	2,190	1,543	1,138	1,006	163,647	178%	
1974	1,691	11,002	15,587	23,611	7,014	36,481	27,306	6,143	3,291	2,767	1,894	1,386	138,173	151%	
1975	1,666	2,208	5,214	4,243	17,727	27,190	8,658	4,046	2,487	1,709	1,371	1,172	77,692	85%	
1976	1,918	1,440	1,420	1,260	1,277	1,734	1,470	990	702	551	658	591	14,012	15%	**37%**
1977	707	863	1,008	1,390	922	1,316	732	713	558	410	400	541	9,558	10%	
1978	508	1,327	4,304	52,633	29,773	28,069	16,298	6,481	3,070	2,048	1,304	1,244	147,059	160%	
1979	916	1,607	1,500	8,166	19,827	13,410	7,254	3,277	1,797	1,242	1,260	857	61,113	67%	
1980	1,623	1,517	8,639	35,128	53,333	15,753	7,908	4,212	2,761	2,189	1,482	1,291	135,837	148%	
1981	1,101	1,196	2,404	7,858	3,499	11,953	4,011	1,949	1,023	793	683	666	37,136	40%	
1982	978	6,069	10,355	71,756	28,996	35,632	54,791	8,166	3,671	2,644	2,054	1,547	226,659	247%	143%
1983	1,783	7,503	19,037	40,367	60,813	91,186	27,235	19,811	6,694	4,046	2,705	2,005	283,186	309%	
1984	1,998	12,186	29,668	11,332	7,253	5,946	3,701	2,669	1,987	1,525	1,205	904	80,376	88%	
1985	1,580	6,801	5,528	2,822	6,664	9,063	4,504	2,386	1,571	1,088	898	887	43,793	48%	
1986	904	2,059	3,197	7,360	85,083	50,414	8,949	4,439	2,523	1,777	1,340	1,363	169,409	185%	
1987	1,211	1,208	1,506	2,097	6,476	5,288	1,666	1,304	1,059	812	664	649	23,939	26%	
1988	769	1,107	4,913	5,067	1,611	1,377	1,654	1,230	785	646	583	495	20,236	22%	
1989	569	1,351	3,160	1,845	1,355	9,672	2,106	1,347	904	633	756	714	24,413	27%	
1990	1,838	2,452	1,765	2,564	2,738	1,752	1,279	1,802	1,077	836	701	586	19,390	21%	**42%**
1991	621	678	904	849	1,161	19,547	2,594	1,347	916	652	519	493	30,280	33%	
1992	935	857	2,441	2,232	25,810	8,885	2,547	1,672	1,071	805	615	519	48,389	53%	
1993	1,107	702	5,472	44,394	30,718	13,503	5,778	3,419	2,321	1,531	1,187	934	111,065	121%	
1994	1,021	1,380	3,314	2,312	10,502	2,736	2,178	1,857	1,041	775	664	678	28,459	31%	
1995	830	2,820	2,792	58,505	11,424	65,300	13,501	11,947	4,689	2,822	1,838	1,392	177,862	194%	
1996	1,211	1,166	5,620	19,215	48,392	24,712	8,676	7,747	3,850	2,380	1,623	1,363	125,955	137%	
1997	1,476	3,969	30,971	72,063	14,773	6,948	4,040	2,699	1,999	1,482	1,260	1,006	142,687	155%	154%
1998	1,064	3,844	5,196	26,409	102,910	21,551	16,155	11,006	7,813	4,027	2,496	1,833	204,305	223%	
1999	1,765	3,195	3,333	11,006	25,253	15,378	13,037	5,460	3,261	2,177	1,716	1,327	86,907	95%	
2000	1,285	2,053	1,605	16,934	46,746	22,037	7,908	4,489	2,701	2,023	1,470	1,345	110,595	120%	
2001	2,115	1,595	1,642	6,229	13,123	12,513	4,338	2,576	1,553	1,254	1,027	893	48,857	53%	
2002	941	3,493	22,658	15,526	5,881	7,280	4,022	2,755	1,738	1,365	1,125	988	67,772	74%	**76%**
2003	947	2,350	28,893	11,332	5,004	5,331	10,068	6,536	2,678	1,648	1,285	1,018	77,090	84%	
2004	935	1,577	16,952	17,020	25,091	11,603	4,005	2,380	1,624	1,242	996	857	84,280	92%	
2005	2,478	1,976	15,864	28,887	16,706	24,281	12,728	7,034	3,856	2,558	1,789	1,470	119,626	130%	173%
2006	1,359	1,565	28,684	26,163	9,902	45,913	62,360	10,188	5,034	3,210	2,220	1,720	198,318	216%	
2007	1,574	1,839	3,283	2,078	8,269	3,954	2,249	1,636	1,137	922	787	750	28,478	31%	
2008	990	869	1,802	23,734	13,546	4,950	2,315	1,629	1,077	879	762	684	53,238	58%	**69%**
2009	799	1,720	1,918	1,383	18,866	12,279	2,755	2,017	1,256	947	805	714	45,460	50%	
2010	6,087	1,172	2,410	22,640	21,054	15,839	14,477	4,888	2,380	1,642	1,230	976	94,796	103%	119%
2011	1,328	2,225	16,608	8,135	17,933	47,622	11,585	5,786	5,522	2,785	2,011	1,476	123,016	134%	
2012	1,789	1,839	1,488	4,120	2,134	16,817	9,842	3,271	1,952	1,488	1,088	922	46,750	51%	
2013	1,002	3,856	29,084	6,880	2,849	2,730	2,095	1,322	1,023	885	824	720	53,271	58%	
2014	701	851	978	812	2,721	3,074	1,803	867	607	519	430	468	13,831	15%	**48%**
2015	470	964	16,368	1,968	5,587	1,549	1,529	1,058	732	536	435	398	31,594	34%	
2016	430	702	2,570	14,517	3,181	43,533	4,677	2,582	1,505	1,125	892	738	76,453	83%	
2017	2,109	2,166	14,609	99,979	106,243	28,469	21,380	7,803	4,356	2,755	1,931	1,488	293,286	320%	320%
Avg	1,359	2,868	8,945	19,271	21,169	18,637	9,330	4,142	2,313	1,569	1,189	994	91,787	100%	117%
Min	430	678	904	812	922	1,316	732	713	558	410	400	398	9,558	10%	37%
Max	6,087	13,412	30,971	99,979	106,243	91,186	62,360	19,811	7,813	4,046	2,705	2,005	293,286	320%	320%

Source: https://waterdata.usgs.gov/ca/nwis/sw (gaged record extends back to WY 1937).

Dry-year designation triggered sometime from October through February as defined by water right (Table 4-3).

Felton diversions not permited based on monthly average SLRBT flow below permit threshold (Table 4-3).

afm, afy acre-feet per month, acre-feet per year

WY water year; e.g., WY 2017 extended from Oct. 1, 2016 through Sep. 30, 2017.

Table 4-4

San Lorenzo River at Big Trees Monthly Record of USGS Gauged Streamflow, WYs 1970–2017

Ben Lomond 4 NOAA Precipitation Gauge

Rank	Water Year	Precip-itation (inches/ year)*	Percent of Average Annual Precipitation for Period of Record (WYs 1975-2017)	
1	1977	20.0	41%	40-60%
2	1976	21.6	44%	
3	2014	22.8	47%	
4	1990	24.3	50%	
5	1987	26.9	55%	
6	2007	29.0	59%	
7	1988	30.3	62%	60-80%
8	1972	31.2	64%	
9	1991	32.0	65%	
10	1981	33.0	67%	
11	1994	33.1	67%	
12	1989	34.3	70%	
13	2015	34.4	70%	
14	2013	36.8	75%	
15	2001	37.2	76%	
16	2012	37.8	77%	
17	2009	38.6	79%	
18	2008	38.8	79%	
19	1984	40.3	82%	80-100%
20	1985	40.7	83%	
21	1992	41.1	84%	
22	1975	42.0	86%	
23	1979	42.7	87%	
24	2004	43.9	89%	
25	1971	43.9	90%	
26	1999	46.3	94%	
27	2016	46.6	95%	
28	2002	47.3	97%	
29	2003	49.0	100%	
30	1970	53.1	108%	100-120%
31	2010	56.2	115%	
32	2000	56.2	115%	
33	1993	57.7	118%	
34	1997	58.7	120%	
35	1996	61.1	125%	120-140%
36	1980	61.4	125%	
37	2011	61.7	126%	
38	2005	66.9	136%	140-160%
39	1986	67.2	137%	
40	1973	67.8	138%	
41	1995	69.1	141%	
42	1978	70.7	144%	
43	1974	71.7	146%	
44	2006	74.6	152%	
45	1982	80.5	164%	160-180%
46	1998	82.8	169%	
47	2017	94.6	193%	180-200%
48	1983	95.7	195%	

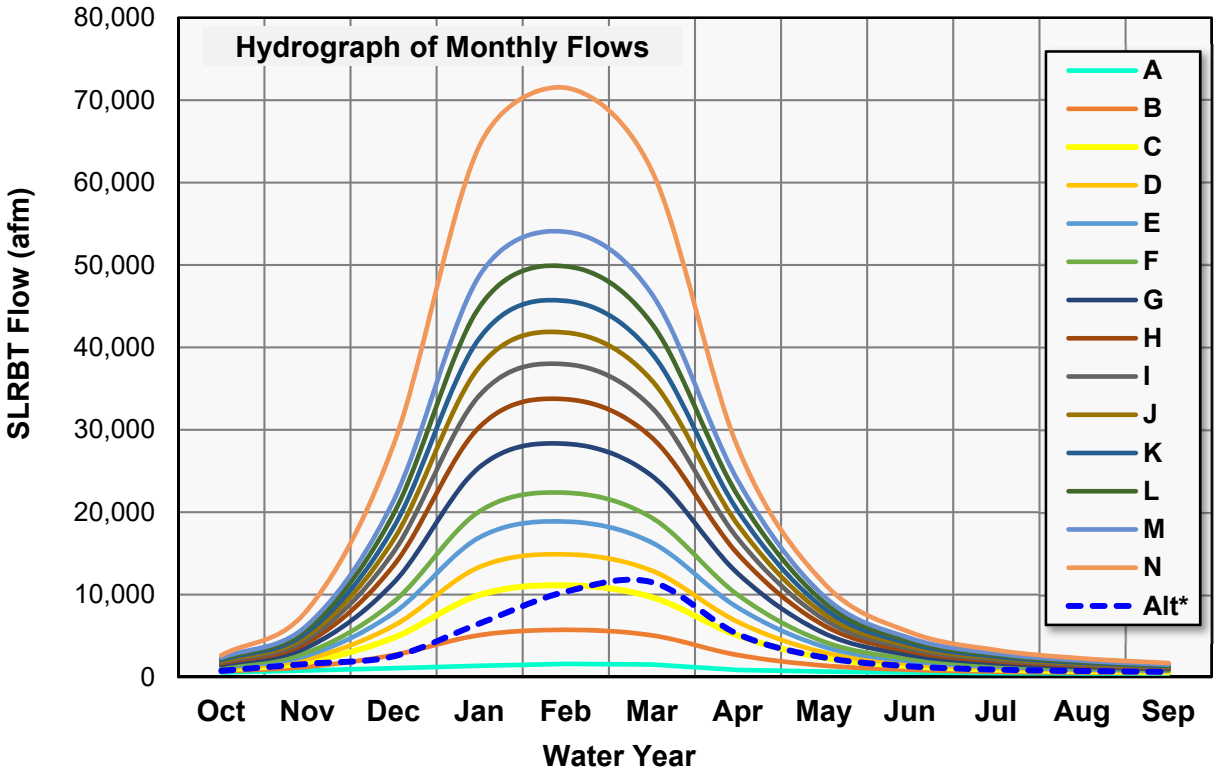
San Lorenzo River at Big Trees (SLRBT) USGS Gauge

Rank	Water Year	Annual Stream-flow (afy)	Percent of Average Annual Streamflow for Period of Record (WYs 1937-2017)	Group	
1	1977	9,569	10%	A	<20%
2	**2014**	13,824	15%		
3	1976	14,010	15%		
4	1990	19,388	21%	B	20-40%
5	1988	20,230	22%		
6	1987	23,929	26%		
7	1972	23,968	26%		
8	1989	24,418	27%		
9	1994	28,456	31%		
10	2007	28,472	31%		
11	1991	30,286	33%		
12	**2015**	31,609	34%		
13	1981	37,141	40%		
14	1985	43,789	48%	C	40-60%
15	2009	45,622	50%		
16	2012	46,677	51%		
17	1992	48,391	53%		
18	2001	48,856	53%		
19	2008	53,225	58%		
20	2013	55,449	60%		
21	1979	61,114	66%	D	60-80%
22	1971	63,944	70%		
23	2002	67,758	74%		
24	**2016**	76,344	83%	E	80-100%
25	2003	77,081	84%		
26	1975	77,699	84%		
27	1984	80,375	87%		
28	2004	84,292	92%		
29	1999	86,920	95%		
30	2010	95,008	103%	F	100-120%
31	1993	111,059	121%	G	120-140%
32	2000	112,261	122%		
33	1970	119,599	130%		
34	2011	123,010	134%		
35	2005	124,138	135%		
36	1996	125,958	137%		
37	1980	135,840	148%	H	140-160%
38	1974	138,170	150%		
39	1997	142,717	155%		
40	1978	147,068	160%		
41	1973	163,637	178%	I	160-180%
42	1986	169,439	184%	J	180-200%
43	1995	177,828	193%		
44	2006	198,330	216%	K	200-220%
45	1998	204,296	222%	L	220-240%
46	1982	226,686	246%	M	240-260%
47	1983	283,194	308%	N	300-320%
48	**2017**	293,305	319%		

SLVWD Diversion Streams Gauged by Balance Hydrologics

2014
2015
2016

WY Category		Range of SLRBT Gauged Annual Flows (afy)	Target Flow for Category	Flow Duration Curve Weighting Wettest	Flow Duration Curve Weighting Driest	Sum of Synthesized Monthly Flows (afy)	Percent Difference
A	10-20%	9,500 - 14,000	10,000	0%	100%	10,170	1.7%
B	20-40%	20,000 - 37,000	27,000	6%	94%	26,982	-0.1%
C	40-60%	44,000 - 55,000	49,000	14%	86%	49,004	0.0%
D	60-80%	61,000 - 68,000	64,300	19%	81%	64,302	0.0%
E	80-100%	76,000 - 87,000	80,500	25%	75%	80,512	0.0%
F	100-120%	95,000	95,000	30%	70%	94,784	-0.2%
G	120-140%	111,000 - 126,000	119,000	38%	62%	118,999	0.0%
H	140-160%	136,000 - 147,000	141,000	46%	54%	141,020	0.0%
I	160-180%	164,000	164,000	52%	48%	158,312	-3.5%
J	180-200%	169,000 - 178,000	174,000	58%	43%	173,980	0.0%
K	200-220%	198,000	198,000	63%	37%	189,648	-4.2%
L	220-240%	204,000	204,000	69%	31%	206,741	1.3%
M	240-260%	227,000	227,000	75%	25%	223,833	-1.4%
N	300-320%	283,000 - 293,000	288,000	88%	12%	288,163	0.1%



* Monthly flows swapped among categories some years to simulate late start to wet season, relevant to Felton water rights; shown by dashed line as example.

afm, afy acre-feet per month, acre-feet per year
WY water year

Table 4-6
Summary of Synthesized Annual and Monthly Flows of the San Lorenzo River at Big Trees

WY	Oct	Nov	Dec	Jan	Feb	Apr	May	Jun	Jul	Aug	Sep
	afm										
Average of Balance Hydrologics low-flow measurements below Clear Ck*											
2014						608	304	167	105	**61**	**62**
2015	100							216	170	93	90
2016	**68**								409	195	168
2017	144								920	563	391
Average of Santa Cruz Co. low-flow measurements above Love Ck*											
1986	230	618								448	574
1987	457										
1990					792	679	619	424	369	248	233
1991	188	196	369	378	250		694	408	288	207	**166**
1992	**47**	239	333	748			864		299	261	396
1993	228	**190**							476		411
1994	377	366		574				756	223	210	201
1995	164								834		364
1996										596	
1997										341	
1998											678
1999	575									809	
2000	518									450	
2001	455							655		316	
2002	275							793	384		
2003	315										344
2004	326							738		319	
2005	659									504	
2006	681									889	
2007	808							405			
2008	333					745		324			226
2009	861							553		268	
2010								875			415
2013										288	
2015								255		**85**	
2017									841		
Avg	416	322	351	567	521	712	725	562	464	390	364
Min	47	190	333	378	250	679	619	255	223	85	166
Max	861	618	369	748	792	745	864	875	841	889	678

Data source: see Table 1-2

WY	Oct	Nov	Dec	Jan	Feb	Apr	May	Jun	Jul	Aug	Sep
	afm										
Average of Santa Cruz Co. low-flow measurements at Mt. Cross Bridge*											
1986	339	808								613	675
1987	496										
1990							497	455		291	
1991	**224**	**190**	406	410	291		813	430	344	**209**	243
1992	226	287		879				677	410	251	
1993	287	395							675	561	453
1994	399	456		744		834			342	298	**211**
1995	256										647
1997											
1999											
2000											
2001	644							768		393	
2002	349									560	
2003	499										
2004	420							877			
2005											
2006	875										
2007	868							498			
2008	386							380			
2009								646			
2010											498
2013										278	
Avg	448	427	406	678	291	834	655	591	443	384	455
Min	224	190	406	410	291	834	497	380	342	209	211
Max	875	808	406	879	291	834	813	877	675	613	675
Average of Balance Hydrologics low-flow measurements below Fall Ck*											
2014						869	595	403	293	246	**210**
2015	283							374	302	213	231
2016	**200**								749	501	
2017	430										

Selected drought minimums
afm acre-feet per month
cfs cubic feet per second
WY water year

*Equivalent rate for average of 1-2 measurements per month; flows >15 cfs omitted.

Table 4-7

Selected San Lorenzo River Low-Flow Measurements at Stations Between Brookdale and Felton, WYs 1986–2017

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	afm											
Average of USGS low-flow measurements at Ben Lomond [a]												
1974											34	45
1975	61	54	80	60	72		89	80	60			
Average of Santa Cruz Co. low-flow measurements at San Lorenzo River [b]												
1986	115	107	108	122							158	
1987	157											
1990								64	88		40	
1991	57	27	51	58	66		101	93	61	68	59	54
1992	66	54	55	73		102	97	81	78	65	58	65
1993	56	59	77				54	114		87	74	76
1994	76	78		87		96	74	149	87	77	74	74
1995	103				172	174			187	207		199
1996							193				123	
1997							159		100		117	96
1998	125								215		179	137
1999	124								113			
2000	103								174		124	
2001	69											122
2002	62								136			
2003	132								16			
2004	85								89		78	
2005	75										99	
2006	89										176	
2007	118						98		72			
2008	73								90		58	
2009							115		96			
2010								119	64		76	
2011											98	
2012									101		86	52
2013		93					83		81			
2014	65						24		**17**		**14**	
2015							19		**6**		**7**	
2016							73		62		47	
Average of City Santa Cruz low-flow measurements at Glen Arbor Bridge [c]												
2009											73	58
2010	63	68	76					90	83	83	75	77
2011	77											
2014					38	45	26	20	16	15	15	15
2015	24	15	79	35	31	25	21	18	13	12	11	10
2016	10	15	30	121								
Avg	83	57	69	79	76	88	82	83	84	77	78	77
Min	10	15	30	35	31	25	19	18	6	12	7	10
Max	157	107	108	122	172	174	193	149	215	207	179	199

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Sum
	afm												
Estimated baseflow at San Lorenzo River [d]													
1984	97	119	146	163	160	167	149	136	112	98	87	84	1,517
1985	98	114	137	155	147	159	138	122	96	82	73	76	1,398
1986	96	117	149	178	182	216	212	207	178	155	124	95	1,908
1987	81	74	82	93	95	112	108	105	89	79	67	57	1,044
1988	60	65	79	92	96	109	103	99	84	74	62	53	975
1989	53	58	71	84	87	102	99	94	79	67	54	44	894
1990	45	50	62	75	79	95	94	90	74	60	44	**31**	799
1991	**27**	**32**	47	66	77	98	101	100	85	74	61	52	820
1992	56	63	78	91	95	106	100	93	76	66	56	52	932
1993	59	68	85	100	101	118	114	112	99	91	80	70	1,098
1994	71	73	83	92	88	99	89	81	66	60	60	70	931
1995	91	112	139	160	156	175	160	146	118	99	81	71	1,506
1996	81	97	125	151	162	184	176	166	138	117	94	78	1,569
1997	81	91	116	140	145	171	164	155	128	109	88	73	1,459
1998	77	95	134	178	196	240	237	232	199	173	138	104	2,004
1999	88	81	100	133	152	187	183	177	151	131	107	88	1,578
2000	86	91	110	130	140	165	168	171	154	143	123	102	1,583
2001	92	83	90	102	108	136	146	158	148	136	111	83	1,392
2002	67	59	71	93	108	143	156	166	153	141	121	97	1,374
2003	86	80	91	110	120	151	159	164	147	132	109	86	1,436
2004	78	77	95	118	133	157	153	148	125	108	88	73	1,353
2005	73	83	108										
Avg	75	81	100	119	125	147	143	139	119	105	87	73	1,313
Min	27	32	47	66	77	95	89	81	66	60	44	31	799
Max	98	119	149	178	196	240	237	232	199	173	138	104	2,004

[a] Equivalent monthly rate for 1 instantaneous measurement per month.
[b] Equivalent rate for average of 1-2 measurements/month.
[c] Equivalent rate for average of 2-5 measurements/month; flows >8 cfs omitted.
[d] Monthly baseflows estimated from available data for groundwater flow model calibration (Johnson, 2005).

Selected drought minimums

afm acre-feet per month
cfs cubic feet per second
WY Water year; e.g., WY 2017 extended from Oct. 1, 2016 through Sep. 30, 2017.
Data sources: see Table 1-2

Table 4-8
Selected Newell Creek Low-Flow Measurements and Estimates, WYs 1974–2016

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
	afm												afy
USGS continuous gauge at Zayante													
1958	62	57	207	614	5,762	3,911	5,962	547	290	174	105	58	17,751
1959	36	52	48	1,945	2,281	509	220	134	77	42	30	307	5,681
1960	51	50	62	262	1,871	183	122	94	42	24	18	19	2,798
1961	30	93	127	95	116	169	91	61	28	10	6	6	832
1962	13	48	115	84	3,169	1,431	165	116	67	42	27	32	5,307
1963	971	79	333	3,213	3,328	1,290	3,189	691	301	145	95	69	13,704
1964	92	530	149	774	209	175	111	87	69	32	10	24	2,262
1965	45	184	2,408	3,096	544	353	1,303	378	151	84	58	32	8,636
1966	39	185	324	469	668	268	144	88	49	27	19	17	2,296
1967	15	217	1,652	5,442	960	3,924	2,803	813	352	165	121	86	16,551
1968	73	85	190	1,318	801	734	296	145	89	45	33	23	3,832
1969	39	71	293	8,361	8,892	2,444	889	367	206	137	88	72	21,858
1970	86	67	898	6,035	908	2,073	367	224	134	79	69	60	11,000
1971	40	569	1,747	692	275	469	328	181	83	47	28	22	4,479
1972	21	55	315	184	182	71	87	50	34	14	9	14	1,034
1973	94	978	214	3,852	6,163	2,033	499	257	145	69	43	32	14,378
1974	66	797	941	2,079	604	3,638	1,906	422	186	135	62	47	10,883
1975	82	118	454	152	1,705	3,085	862	376	177	80	51	40	7,183
1976	115	70	62	61	67	105	84	40	28	9	18	19	679
1977	22	39	65	93	45	82	31	32	11	**4**	**1**	14	439
1978	13	83	388	7,385	3,188	3,217	1,277	544	222	125	64	58	16,566
1979	48	100	84	890	1,652	1,106	561	245	107	68	51	35	4,945
1980	77	85	619	2,915	5,250	1,350	651	321	177	121	74	56	11,696
1981	52	45	178	705	263	880	242	121	55	43	20	16	2,620
1982	34	554	907	6,230	2,600	1,975	5,256	531	259	202	99	77	18,725
1983	100	389	1,754	4,790	6,910	11,244	2,229	2,900	522	282	152	94	31,367
1984	141	852	3,020	834	442	385	242	177	126	87	61	49	6,414
1985	58	417	262	149	480	545	248	120	65	36	40	28	2,447
1986	36	113	207	640	11,857	6,865	611	278	138	101	65	62	20,973
1987	52	49	83	104	711	503	89	65	39	22	15	23	1,754
1988	24	49	387	398	91	63	96	65	35	18	15	11	1,252
1989	18	87	164	99	75	749	131	62	69	49	23	22	1,548
1990	139	226	141	144	193	148	86	121	71	42	33	27	1,370
1991	32	39	47	53	66	2,131	224	80	55	34	22	12	2,794
1992	19	36	98	124	2,715	615	223	105	55	28	10	**5**	4,034
1993	28	22	342	-	-	-	-	-	-	-	-	-	-
Avg	80	208	536	1,837	2,144	1,678	904	310	129	75	47	45	8,003
Min	13	22	47	53	45	63	31	32	11	4	1.3	5	439
Max	971	978	3,020	8,361	11,857	11,244	5,962	2,900	522	282	152	307	31,367

afm acre-feet per month
afy acre-feet per year
cfs cubic feet per second
WY Water year; e.g., WY 2011 began Oct. 1, 2010 and extended through Sep. 30, 2011.

Selected drought minimums

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	afm											
Average of Santa Cruz County low-flow measurements at Zayante*												
1976	-	30	12	98	51	86	-	-	-	**7**	-	**1**
1977	-	-	-	-	50	-	-	-	12	-	-	280
1978	9	-	-	-	-	-	-	-	-	105	-	12
1980	39	-	-	-	-	-	-	-	-	-	-	57
1981	-	-	-	-	-	-	-	129	-	-	-	15
1982	-	-	-	-	-	-	-	-	-	-	-	65
1984	-	-	-	-	-	-	214	-	-	-	-	-
1986	194	146	531	979	-	-	-	578	953	226	324	151
1987	206	216	323	365	657	882	390	571	337	147	31	115
1988	116	245	519	168	-	366	395	386	103	793	84	45
1989	135	333	181	322	126	1,063	600	278	157	57	56	14
1990	22	237	168	111	167	176	125	95	92	31	30	48
1991	14	44	18	45	41	-	-	157	61	40	51	10
1992	**7**	51	80	261	86	-	92	242	61	14	-	**4**
1993	46	12	160	-	-	-	178	-	227	32	34	39
1994	49	78	-	66	-	140	63	132	49	26	22	16
1995	26	17	169	-	187	-	-	-	287	167	-	65
1996	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	83	-	-	-	-	288	-	93	-	-	51
1998	51	-	-	-	-	-	-	-	-	-	202	-
1999	120	-	-	-	-	-	-	-	149	-	112	-
2000	44	-	-	-	-	-	-	-	194	-	151	-
2001	-	-	-	-	-	-	-	-	-	56	-	81
2002	107	-	-	-	-	-	-	-	-	-	-	-
2003	44	-	-	-	-	-	-	-	-	-	-	243
2004	61	-	-	-	-	-	-	-	95	-	50	-
2005	28	-	-	-	-	-	-	-	-	-	130	-
2006	-	-	-	-	-	-	-	-	-	-	154	-
2007	86	-	-	-	-	-	118	-	59	-	26	-
2008	27	-	-	-	-	-	-	-	68	-	17	-
2009	-	-	-	-	-	-	215	-	74	-	-	-
2010	-	-	-	-	-	-	-	-	161	-	87	-
2011	-	-	-	-	-	-	-	-	-	-	128	-
2012	-	-	-	-	-	-	-	-	89	-	47	-
2013	-	-	-	-	-	-	116	-	-	-	-	-
2014	16	-	-	-	-	-	47	-	61	-	10	-
2015	-	-	-	-	-	-	77	-	41	-	10	-
2016	-	-	-	-	-	-	262	-	92	-	23	-
Avg	66	124	216	268	170	452	212	285	153	131	81	69
Min	7	12	12	45	41	86	47	95	12	7	10	1.2
Max	206	333	531	979	657	1,063	600	578	953	793	324	280

*Equivalent rate from averaging 1-6 measurements/month; flows >5 cfs omitted.
Data sources: http://waterdata.usgs.gov/ca/nwis/sw; Table 1-2.

Table 4-9

Zayante Creek at Zayante Continuous Gauged Flow and Selected Low-Flow Measurements, WYs 1958–2016

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	afm											
Zayante Creek: average of Santa Cruz Co. low-flow measurements at San Lorenzo River[a]												
1986	425	284		837	1,311		1,803	1,138	648		438	541
1987	432	378						372				
1988		280						291				
1989		228						920				
1990					474	453	312	299	300	350	193	224
1991	215	196	242		218			310	246	205	210	315
1992	**128**	184	221	374	274	1,522	619	374	246	204	204	187
1993	190	265	633			4,899	660	678	450	377	274	208
1994	264	243		311	2,032	638	463	460	363	220	242	183
1995	198	1,232	443		1,770	1,479			777	484		318
1996							1,722				346	
1997							833		415		333	304
1998	283						2,276		1,336		739	
1999	496						2,039		794		377	
2000	352						1,776		661		439	
2001	285										332	
2002	518						767		392			228
2003	309						1,351		935			571
2004	244						786		368		283	
2005	283						1,674				539	
2006	337						4,156		1,171			
2007	400						540		317			
2008	234								425		253	
2009							709		291			
2010								1,165	501		382	
2011										724	559	
2012									458		212	303
2013	416	345					551		348			
2014	301						400		256		206	
2015	189						413		160		**166**	
2016							808		430		310	
2017									1,028	633		
Avg	309	364	385	507	1,013	1,798	1,174	601	533	400	335	308
Min	128	184	221	311	218	453	312	291	160	204	166	183
Max	518	1,232	633	837	2,032	4,899	4,156	1,165	1,336	724	739	571

Selected drought minimums

[a] Equivalent rate from averaging 1-3 measurements/month; flows >12 cfs omitted.

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	afm											
Lompico Creek: average of Santa Cruz Co. low-flow measurements at Carrol Avenue[b]												
1986	2.5	7.1	39					52	24		11	15
1987	26											
1991		0.6	3.1	3.1	2.8		47	6.8		5.5	1.8	3.0
1992	1.8	2.4	0.6	8.6	5.0	41	11	17	4	1.2	1.2	**0.0**
1993	**0.0**	1.8	18				45	27	19	6.8	5.5	1.2
1994	1.2	**0.0**		1.8		12	7.1	5.5	3.6	6.1	6.1	0.0
1995	0.0	6.5	22		16				51	21		8.3
1996							43					
1997		12					44		17			3.0
1998	3.1										20	
1999	37								23		32	
2000	16						55		18		20	
2001										15		
2002												
2003	17								41		19	
2004	1.8						34		10		6.0	
2005	13										14	
2006	10								44		16	
2007	12						27		9.2		3.5	
2008									10		6.0	
2009							34		14			
2010									19		12	
2011											15	
2012									23		16	
2013							12		11			
2014							10		10		3.9	
2015							16		5.2		2.2	
2016							37		18		5	
Avg	10	4.4	17	5	8	27	30	22	19	9.3	11	4.4
Min	0.0	0.0	0.6	1.8	2.8	12	7.1	5.5	3.6	1.2	1.2	0.0
Max	37	12	39	9	16	41	55	52	51	21	32	15

[b] Equivalent rate from averaging 1-2 measurements/month; flows >1 cfs omitted.

afm acre-feet per month
cfs cubic feet per second
WY water year

Table 4-10
Selected Zayante Creek and Lompico Creek Low-Flow Measurements, WYs 1986–2017

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
	afm												afy
USGS continuous gauge near Scotts Valley													
1989	-	-	-	-	175	1,045	251	143	131	115	113	118	-
1990	183	244	185	248	258	241	156	185	127	123	117	105	2,172
1991	121	119	133	130	134	1,967	272	143	117	**105**	115	109	3,465
1992	152	133	258	178	2,889	809	224	151	150	140	122	120	5,327
1993	131	117	745	4,925	2,896	1,387	470	239	179	143	140	134	11,506
1994	132	144	273	233	1,178	234	189	175	106	125	125	111	3,026
1995	193	299	299	6,129	726	4,413	668	732	258	176	134	125	14,153
1996	121	123	435	1,994	3,535	2,281	678	644	272	182	157	132	10,553
1997	142	310	4,459	5,917	873	394	284	219	165	124	124	128	13,139
1998	139	351	459	3,250	9,267	2,097	1,290	750	560	301	204	156	18,824
1999	179	298	295	1,432	2,620	1,121	1,017	256	184	147	133	124	7,808
2000	120	219	169	2,304	5,309	1,617	514	329	225	178	147	149	11,279
2001	233	163	166	679	1,725	1,424	275	172	129	124	114	103	5,307
2002	127	255	1,805	1,542	513	640	311	210	150	134	120	109	5,916
2003	125	221	2,911	1,158	348	454	642	451	212	151	123	116	6,912
2004	117	144	1,447	1,666	1,755	777	288	201	163	148	128	125	6,958
2005	340	242	1,711	2,497	1,439	2,216	879	360	253	196	158	140	10,430
2006	125	154	2,375	2,067	652	3,237	4,491	596	322	245	206	166	14,637
2007	164	200	279	200	553	292	194	140	128	119	109	**102**	2,479
Avg	158	207	1,022	2,030	1,939	1,402	689	321	202	157	136	125	8,549
Min	117	117	133	130	134	234	156	140	106	105	109	102	2,172
Max	340	351	4,459	6,129	9,267	4,413	4,491	750	560	301	206	166	18,824
Balance Hydrologics continuous gage above mouth at Mount Hermon													
2017	-	-	-	-	-	-	-	-	-	283	245	212	-

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	afm											
Average of Santa Cruz Co. low-flow measurements at Zayante Creek[a]												
1990								180			143	
1991	126							163				
1992	140								182			153
1993												127
1994				168					127			130
1996												190
1997											222	
1998												229
1999	216										197	
2000	195										218	
2001	213									154	144	
2002	173								143			116
2003	160										125	
2004	154								193		156	
2005	206										148	
2006	167											
2007	172						183		133		130	
2008	135								141			128
2009	139	147	162	134				197	145		135	
2010									212			182
2011	168									232	217	189
2013											139	
2014												**112**
2015	**108**						148			123		
2016								200				
2017	152	165										231
Avg	168	156	162	134			166	198	161	170	161	169
Min	108	147	162	134			148	197	133	123	125	112
Max	216	165	162	134			183	200	212	232	218	231

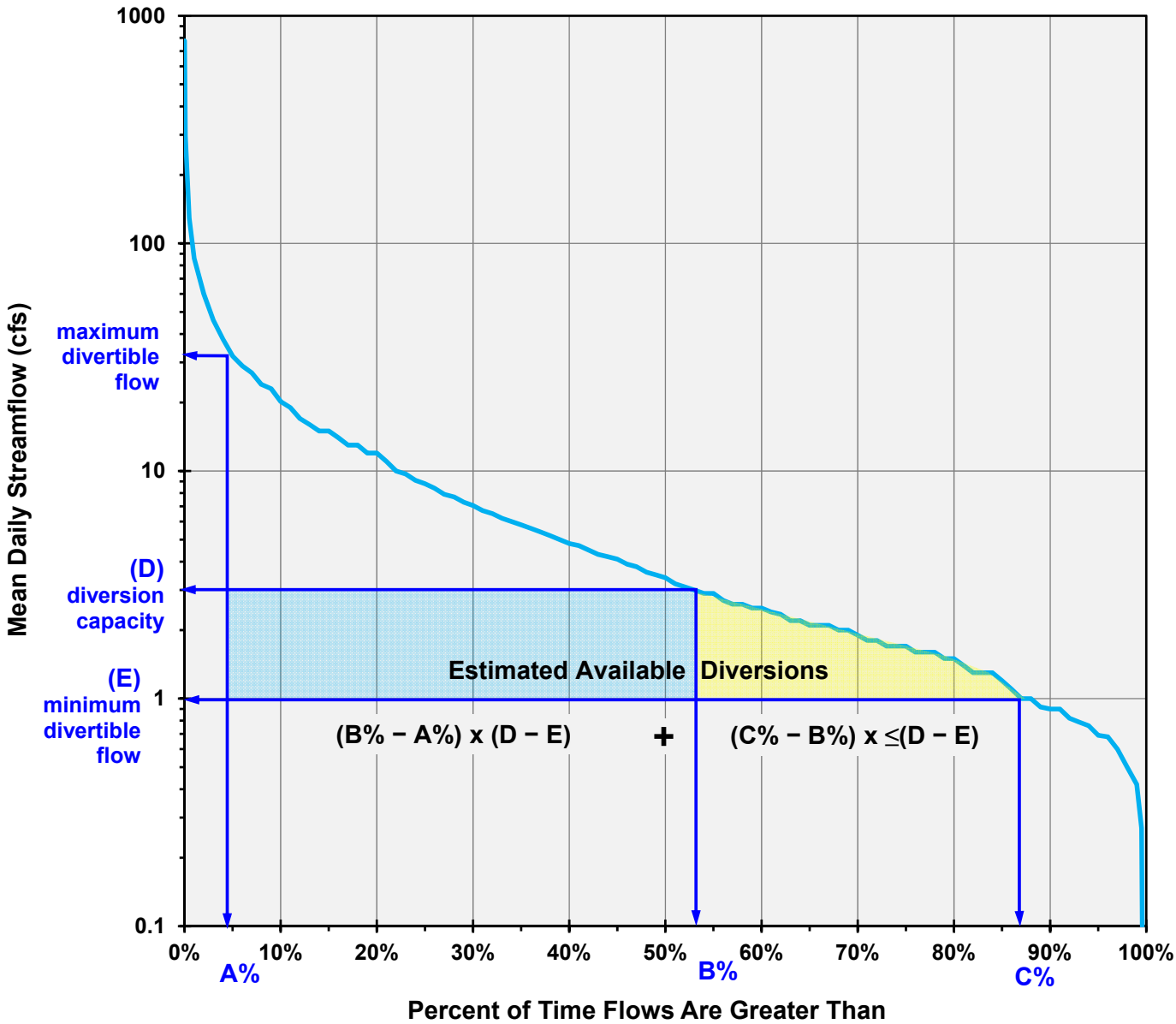
WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	afm											
Average of USGS low-flow measurements near Scotts Valley[b]												
1973	-	-	-	-	-	-	-	-	-	172	-	-
1974	-	262	-	-	-	-	-	-	-	264	-	-
Average of Santa Cruz Co. low-flow measurements at Mount Hermon Rd (USGS Gauge)[c]												
1976	-	155	172	-	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-	113	-	**80**	-
1978	-	-	-	-	-	-	-	-	-	-	-	161
1979	-	-	-	-	-	-	-	-	-	-	-	129
1980	-	-	-	-	-	-	-	-	-	-	-	129
1981	-	-	-	-	-	-	-	114	-	-	-	116
1982	-	-	-	-	-	-	-	-	-	-	-	119
1986	-	-	-	-	-	-	-	-	258	-	-	-
1987	205	-	-	-	-	-	-	167	-	-	-	-
1988	193	-	-	-	-	-	-	-	138	-	-	-
1989	-	124	-	-	-	-	-	-	-	-	-	-
1990	-	232	-	-	-	-	131	146	120	95	95	113
1991	124	120	-	135	112	-	-	158	122	117	117	105
1992	117	122	-	232	64	-	220	-	152	117	108	122
1993	129	132	-	-	-	-	-	243	174	168	136	132
1994	126	122	-	136	-	261	152	179	**89**	**85**	100	97
1995	168	138	-	-	-	52	-	-	82	146	157	-
1996	117	132	-	-	-	-	-	-	-	-	208	174
1997	-	113	-	-	-	-	267	-	163	-	146	-
1998	168	-	-	-	-	-	-	-	-	246	-	-
1999	191	-	-	187	-	-	-	-	202	-	154	-
2000	138	-	-	-	-	-	-	-	250	-	146	-
2001	141	-	-	-	-	-	274	-	113	-	123	-
2002	123	-	-	-	-	-	292	-	149	-	-	119
2003	154	-	-	-	-	-	-	-	-	-	129	-
2004	117	-	-	-	-	-	238	-	155	-	129	-
2005	172	-	-	-	-	-	-	-	232	-	129	-
2006	148	-	-	-	-	-	-	-	292	-	215	-
2007	160	-	-	-	-	-	155	-	119	-	117	-
2008	123	-	-	-	-	-	-	-	-	-	-	-
2015	89	-	-	-	-	-	-	-	-	-	-	-
Avg	145	150	172	172	88	156	216	168	162	157	135	126
Min	89	113	172	135	64	52	131	114	82	85	80	97
Max	205	262	172	232	112	261	292	243	292	264	215	174

[a] Equivalent rate for average of 1-2 measurements/month; flows >4 cfs omitted.
[b] Equivalent monthly rate for 1 instantaneous measurement per month; flows >5 cfs omitted.
[c] Equivalent rate for average of 1-2 measurements/month; flows >5 cfs omitted.

Selected drought minimums

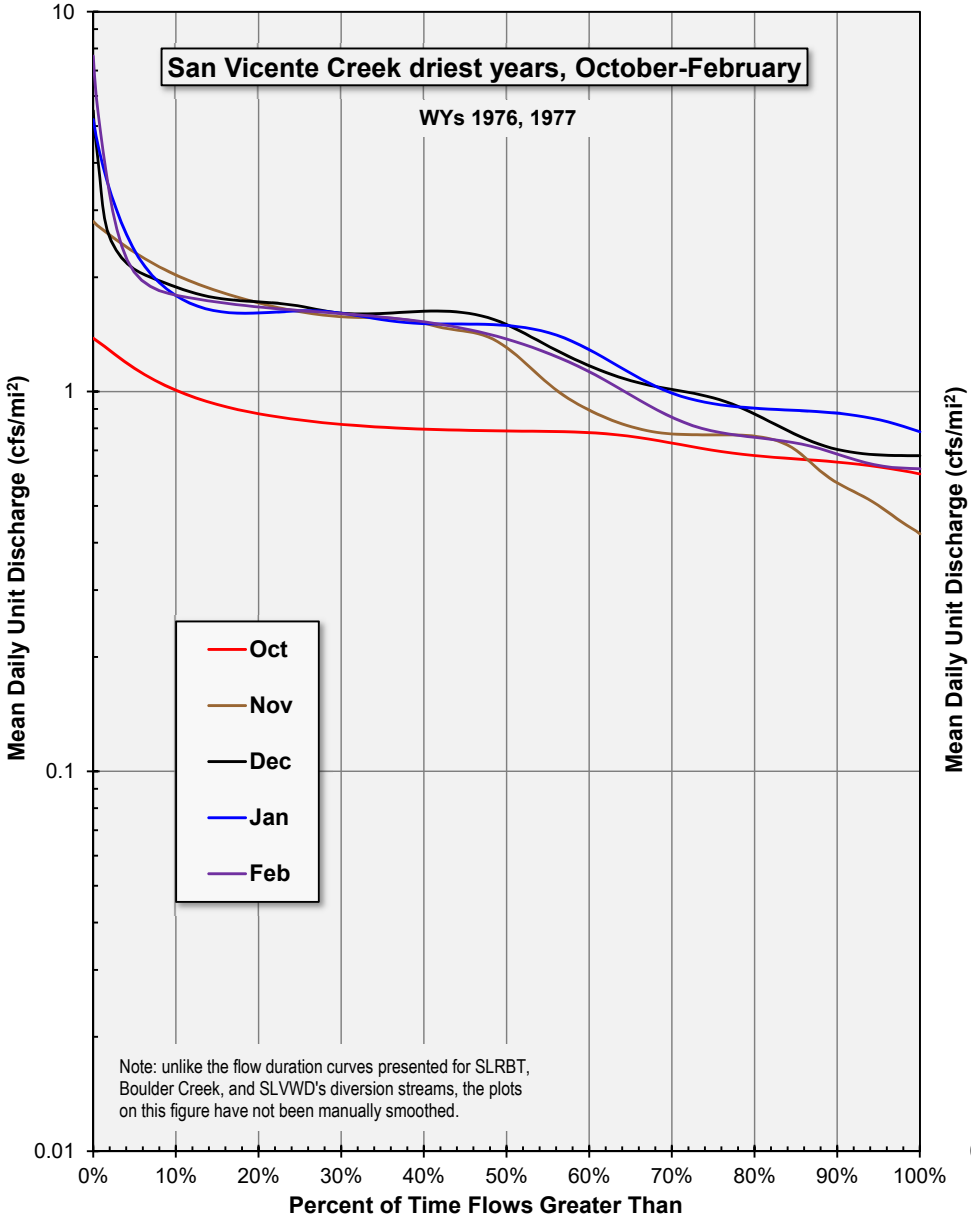
afm, afy acre-feet per month, acre-feet per year
cfs cubic feet per second
WY Water year; e.g., WY 2017 extended from October 1, 2016 through September 30, 2017.
Data source: see Table 1-2

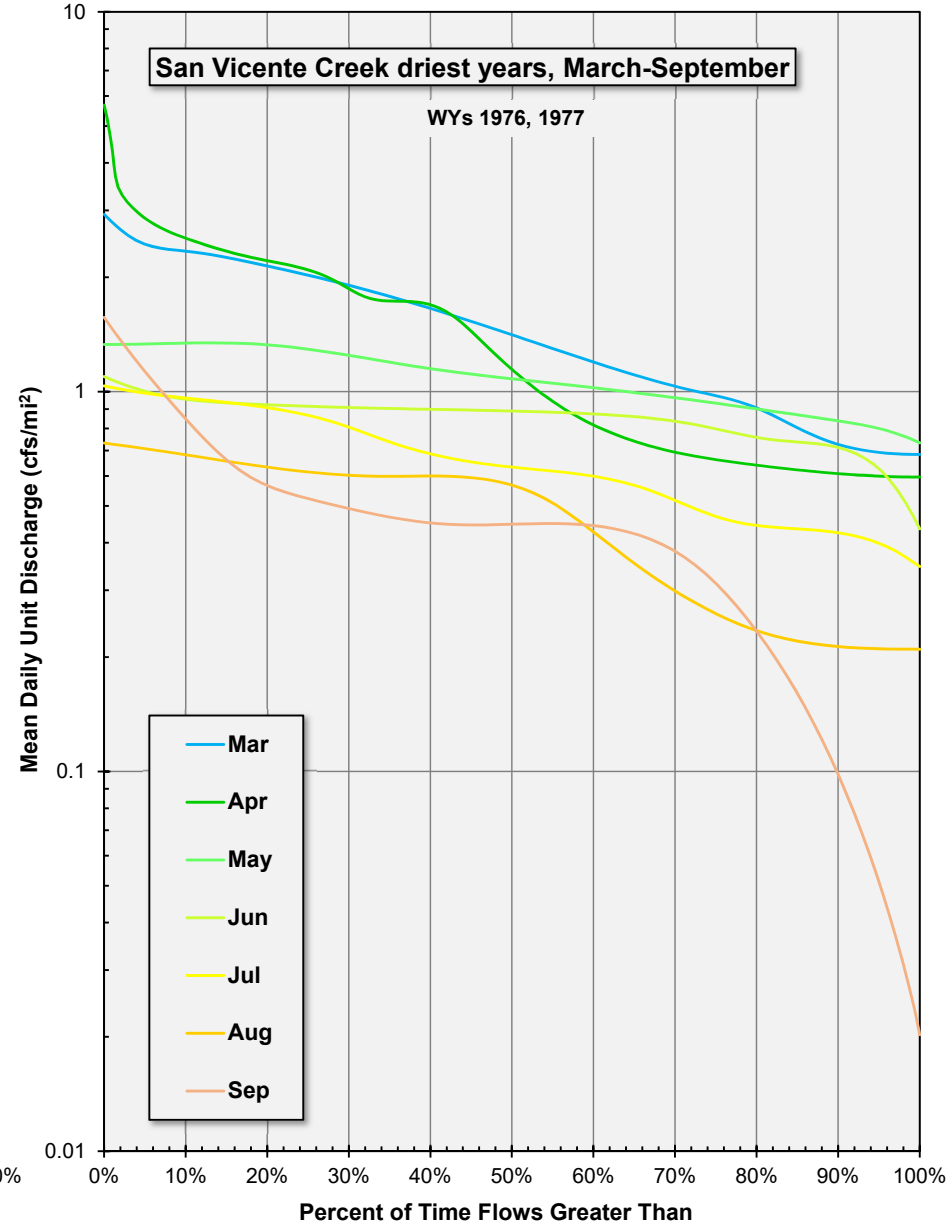
Table 4-11
Bean Creek Continuous Gauged Flow and Selected Low-Flow Measurements, WYs 1973–2017



cfs cubic feet per second

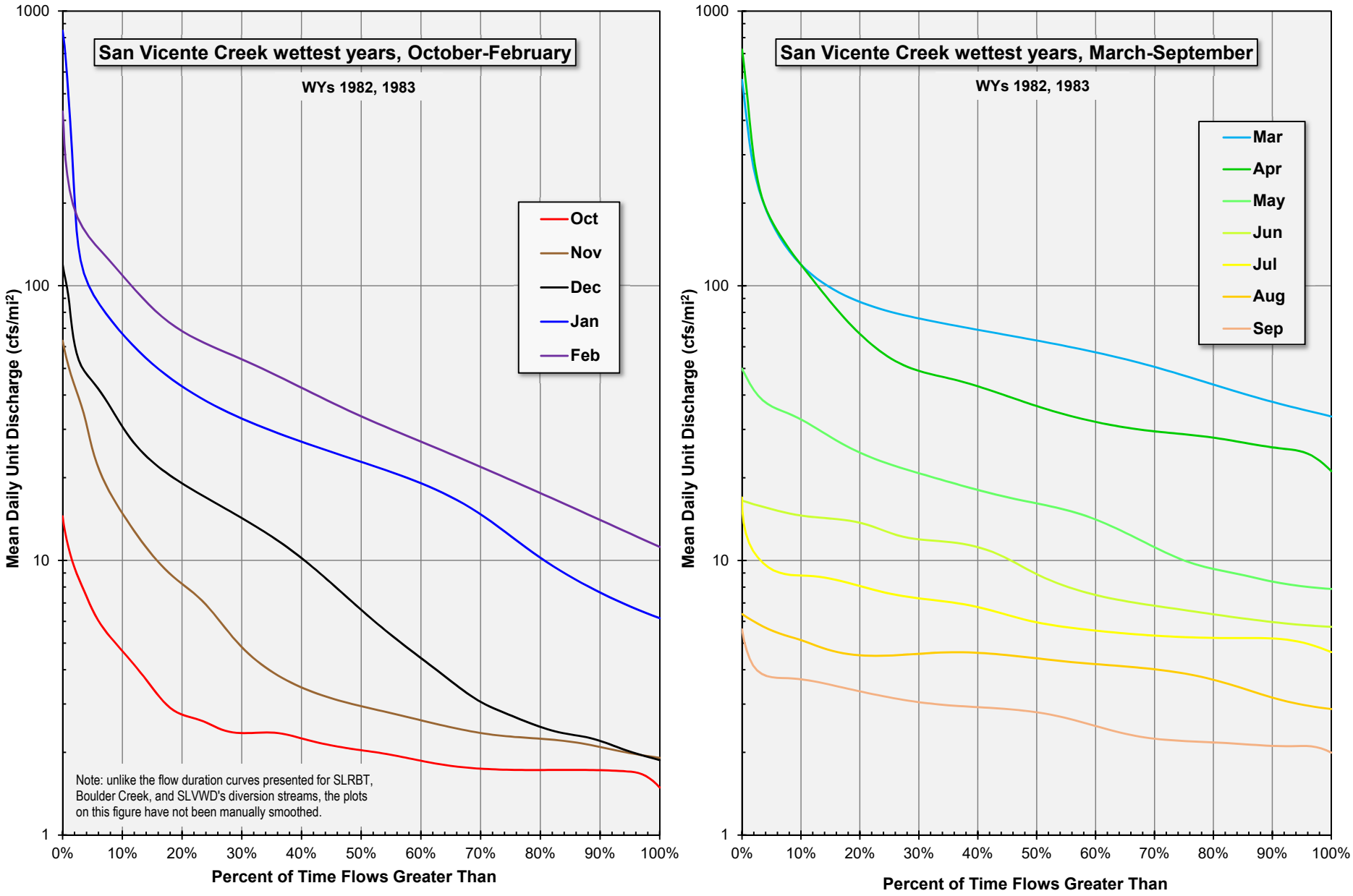
Figure 4-1
Method of Estimating Divertible Flows from a Flow Duration Curve





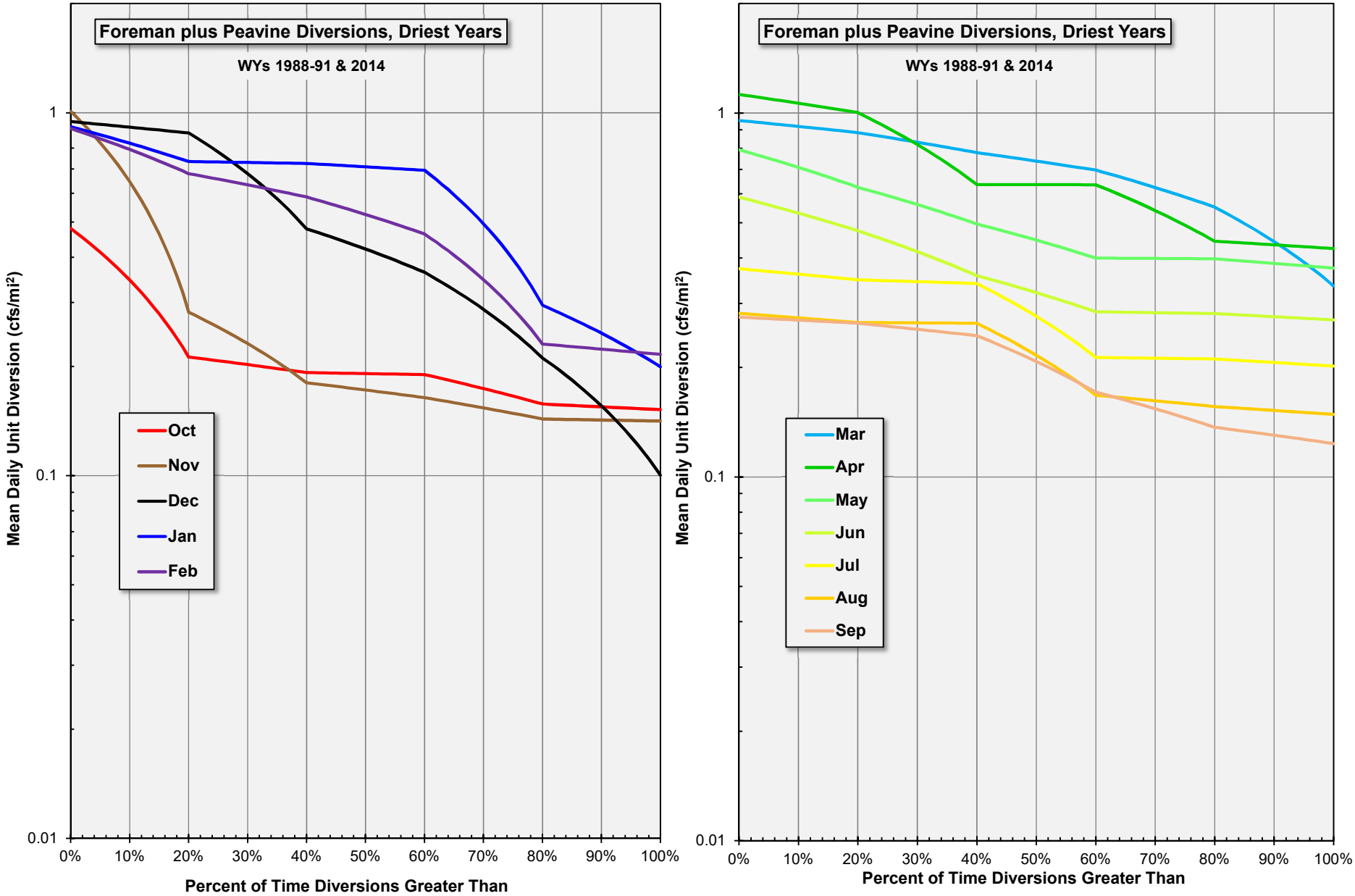
Period of record: WYs 1970-1985 (Table 1-2)
cfs/mi² cubic feet per second per square mile

Figure 4-2
San Vicente Creek near Davenport Monthly Flow Duration Curves, Driest Years



Period of record: WYs 1970-1985 (Table 1-2)
cfs/mi² cubic feet per second per square mile

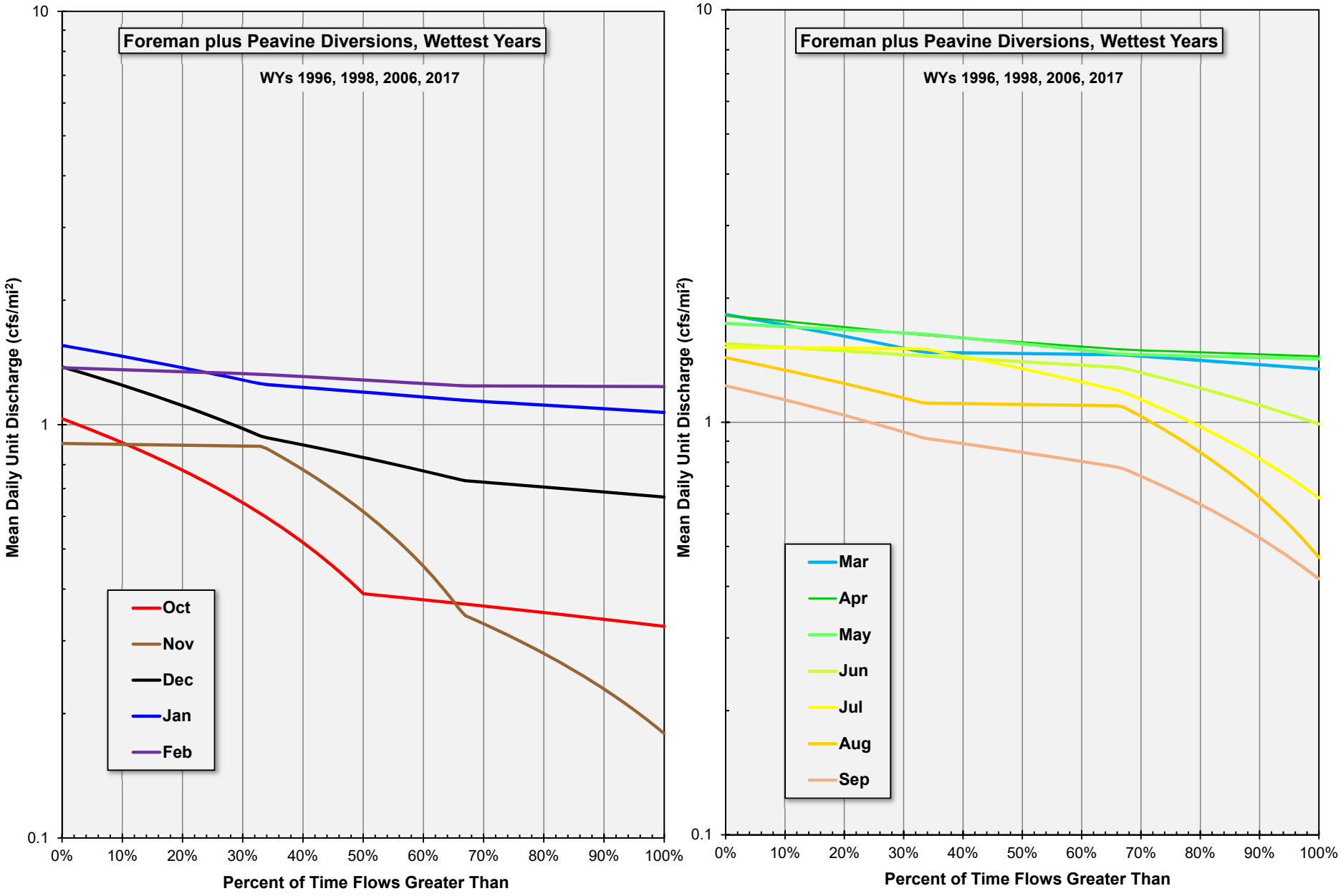
Figure 4-3
San Vicente Creek near Davenport Monthly Flow Duration Curves, Wettest Years



Period of record: WYs 1985-2017 (Table 1-1) cfs/mi² cubic feet per second per square mile

Figure 4-4

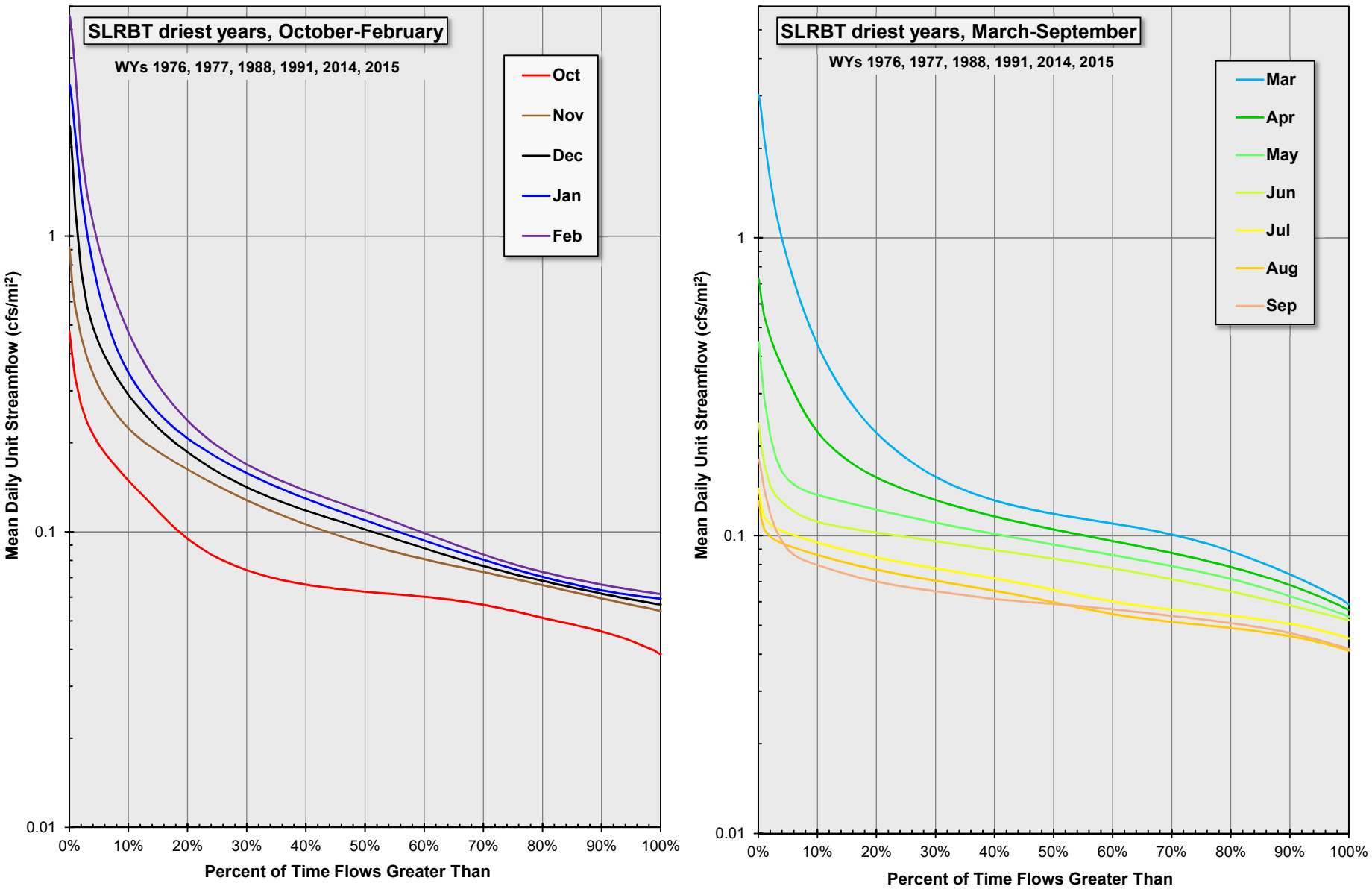
Monthly Flow Duration Curves for Foreman and Peavine Creeks Combined Diversions, Driest Years



Period of record: WYs 1985-2017 (Table 1-1) cfs/mi² cubic feet per second per square mile

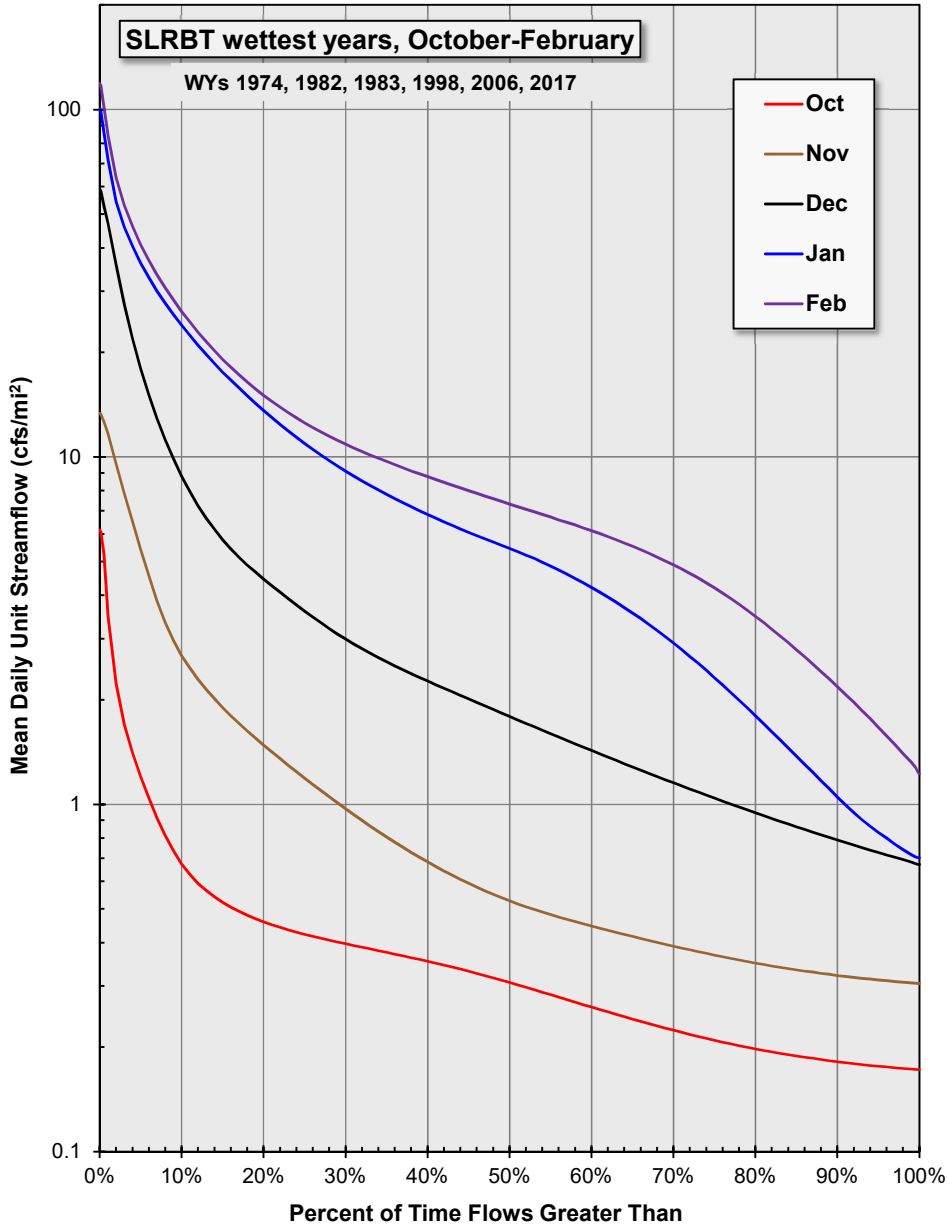
Figure 4-5

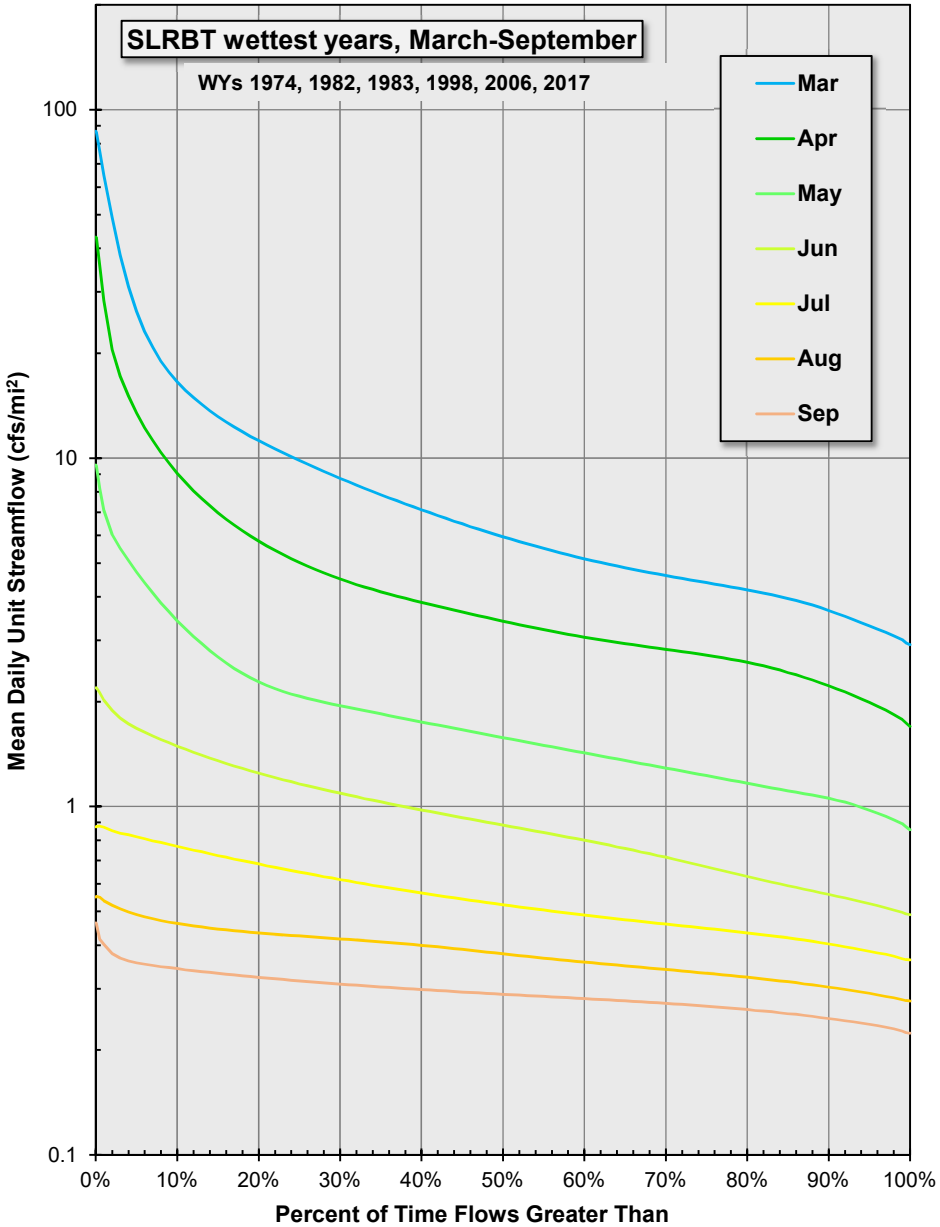
Monthly Flow Duration Curves for Foreman and Peavine Creeks Combined Diversions, Wettest Years



Period of record used: WYs 1970-2017 (Table 1-2)
cfs/mi² cubic feet per second per square mile

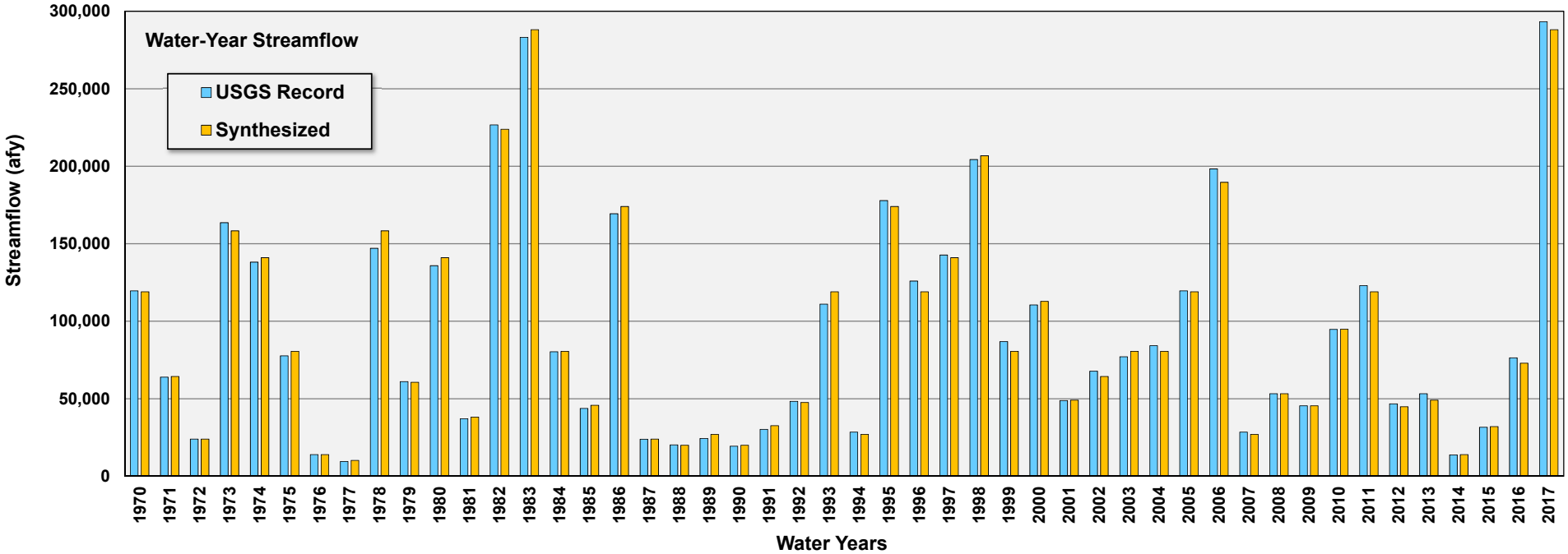
Figure 4-6
San Lorenzo River at Big Trees Monthly Flow Duration Curves, Driest Years

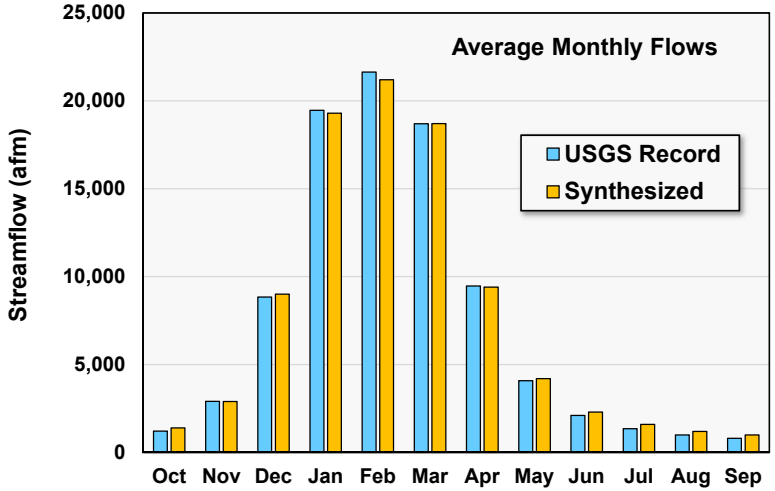




Period of record used: WYs 1970-2017 (Table 1-2)
cfs/mi² cubic feet per second per square mile

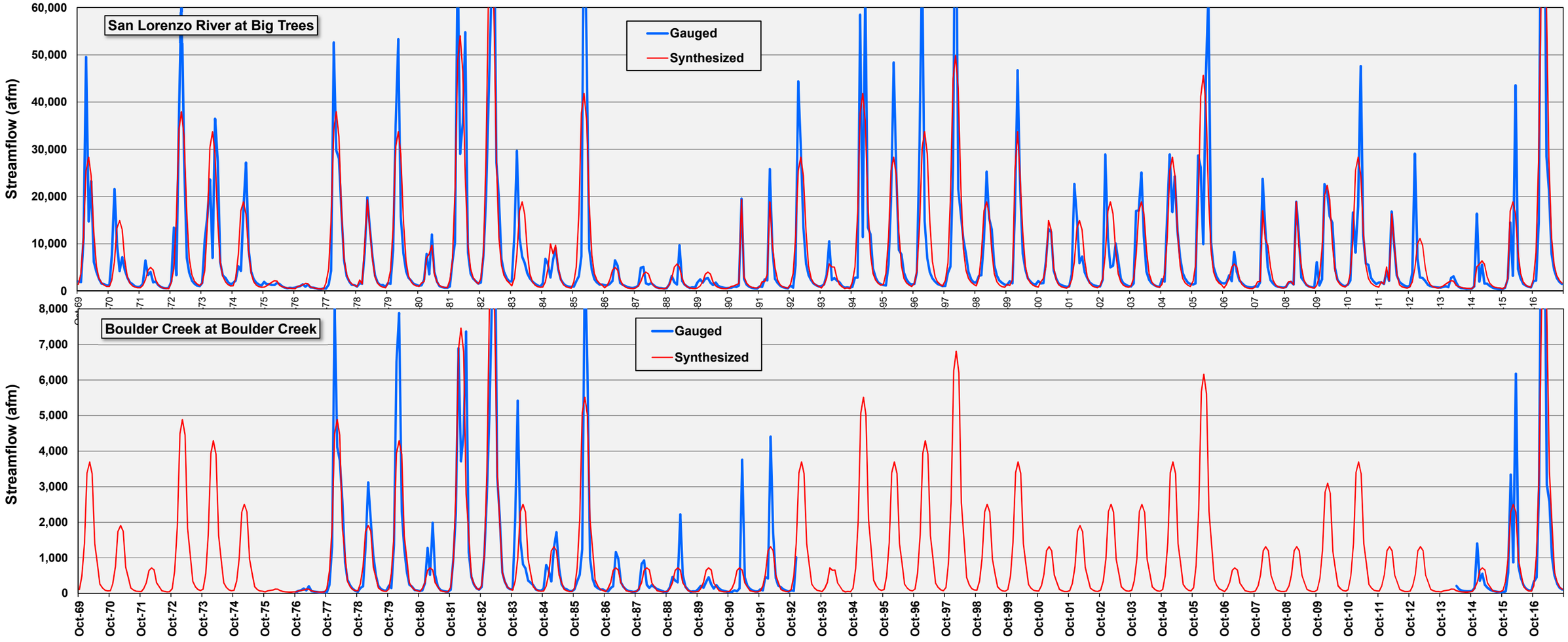
Figure 4-7
San Lorenzo River at Big Trees Monthly Flow Duration Curves, Wettest Years





afm acre-feet per month
afy acre-feet per year

Figure 4-8
San Lorenzo River at Big Trees Gauged versus Synthesized Annual Flow Records, WYs 1970–2017



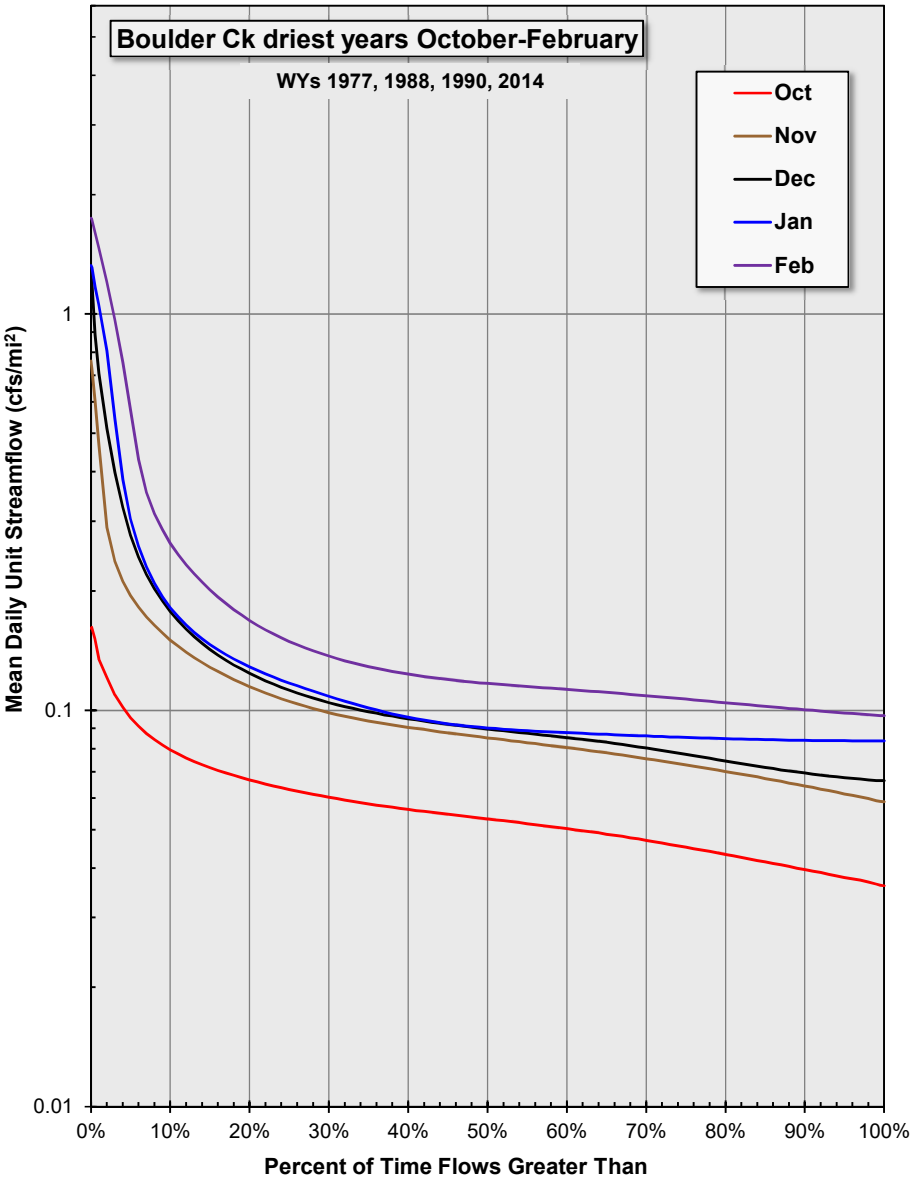
afm acre-feet per month

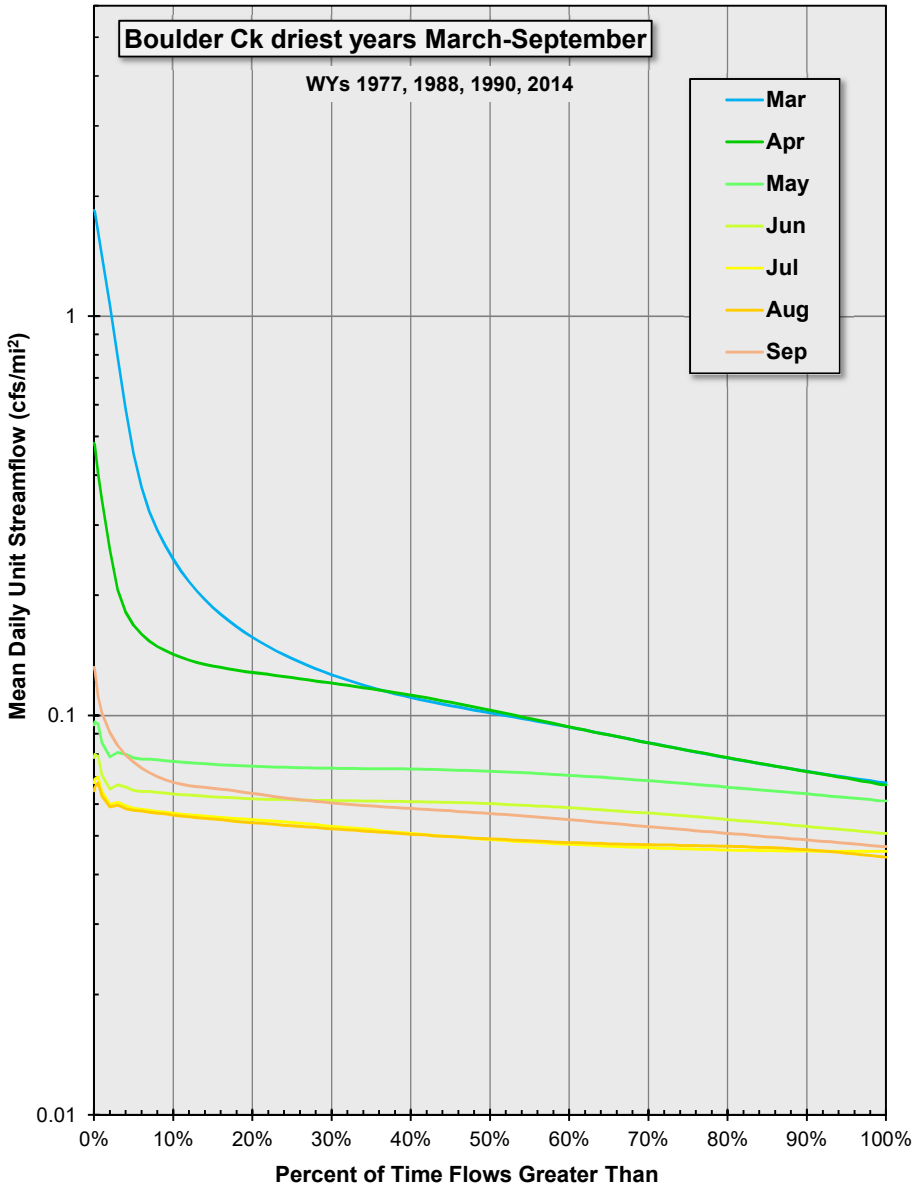
Note differences in vertical-axis scaling.

See Table 1-2 for source of gauged records.

Figure 4-9

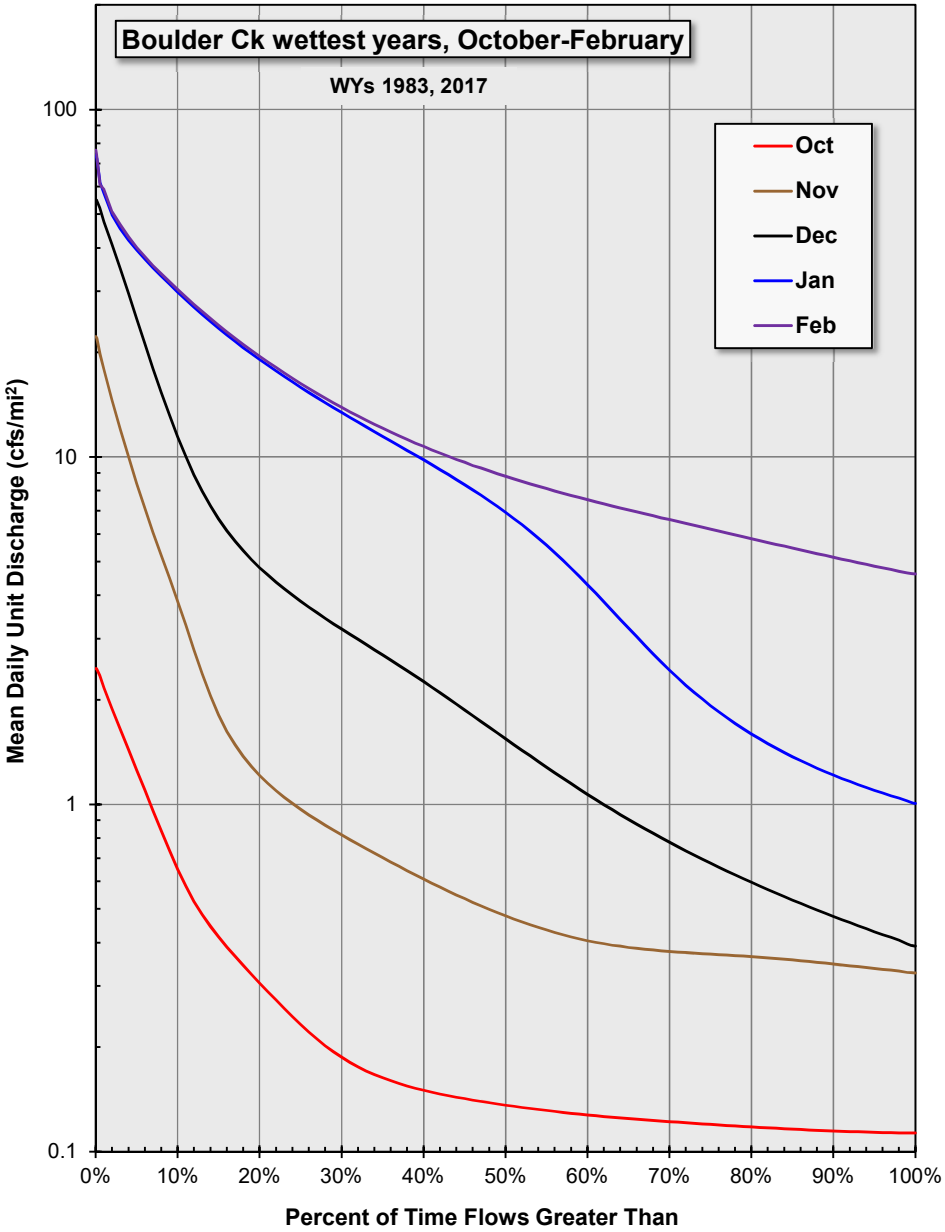
San Lorenzo River at Big Trees and Boulder Creek Gauged versus Synthesized Monthly Streamflow, WYs 1970–2017

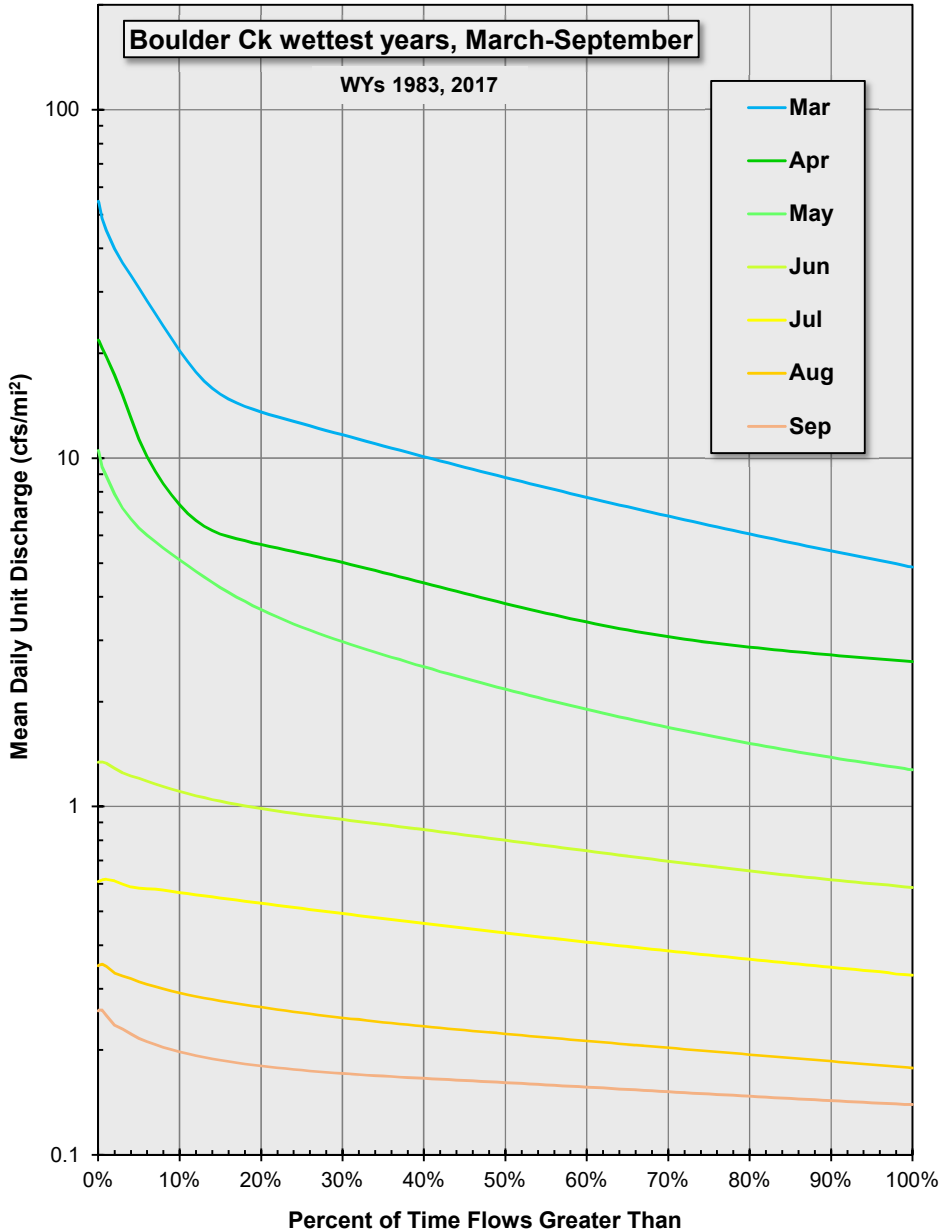




cfs/mi² cubic feet per second per square mile
Period of record: WYs 1977-1993, 2014-2017 (Table 1-2)

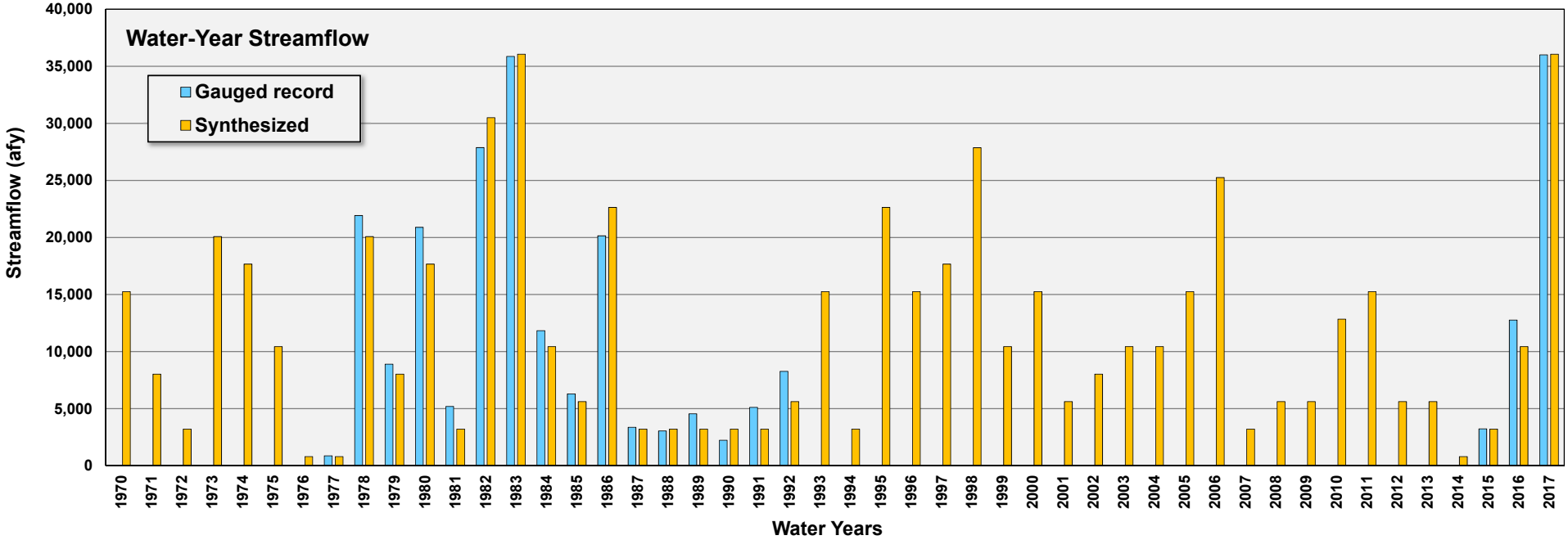
Figure 4-10
Boulder Creek at Boulder Creek Monthly Flow Duration Curves, Driest Years

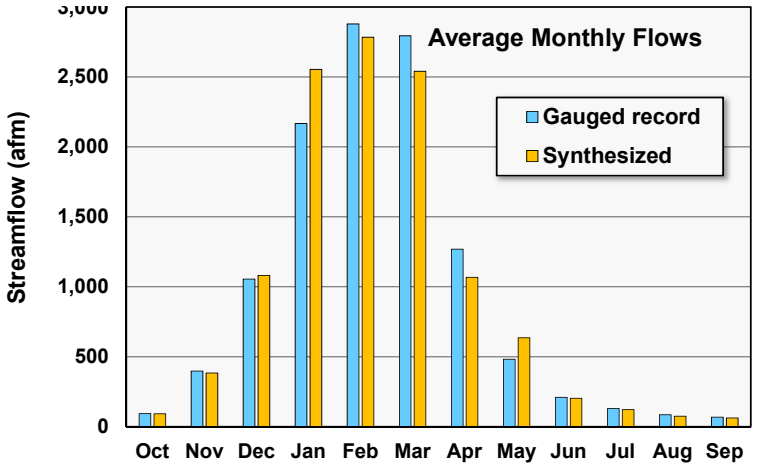




cfs/mi² cubic feet per second per square mile
Period of record: WYs 1977-1993, 2014-2017 (Table 1-2)

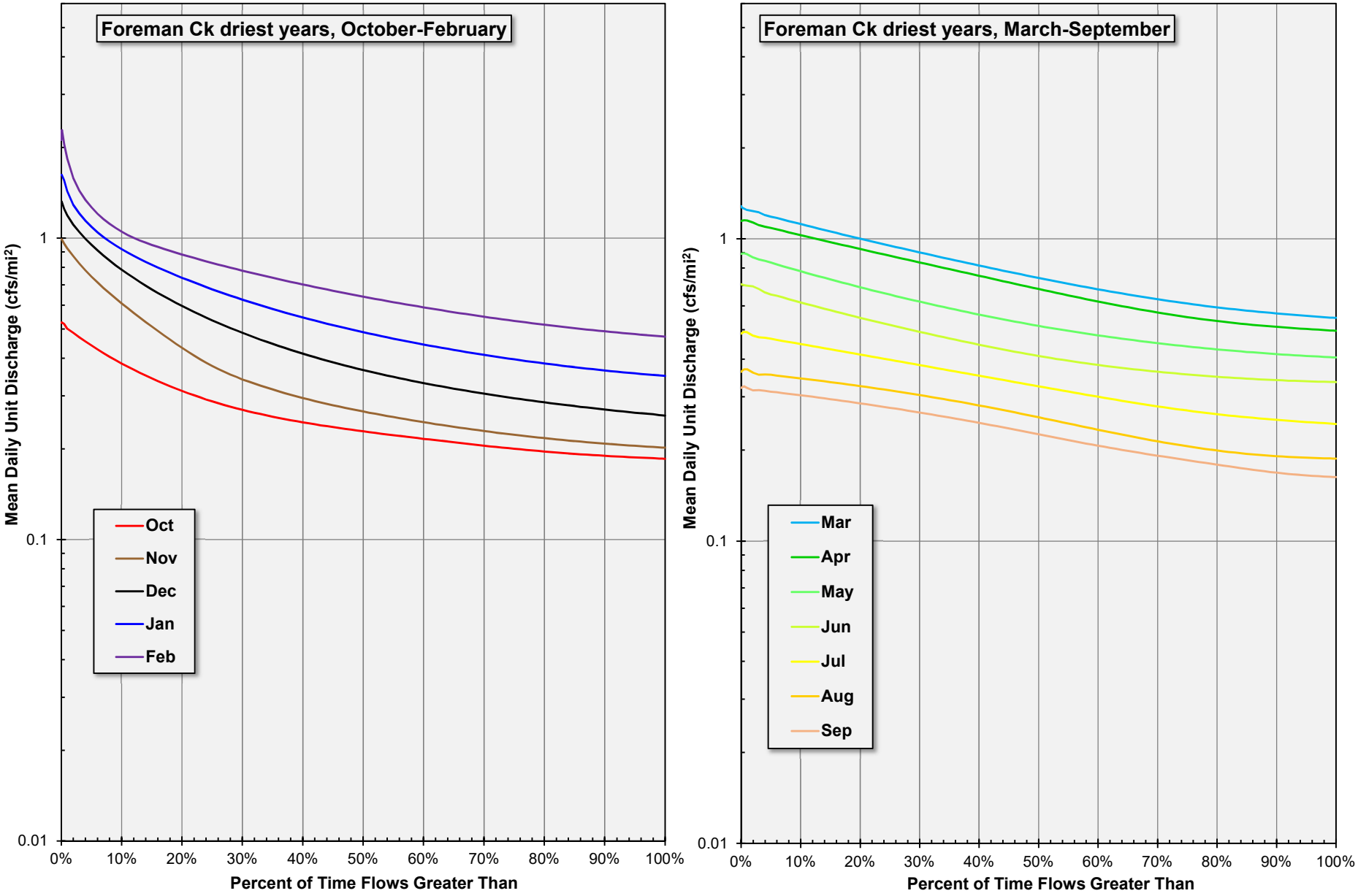
Figure 4-11
Boulder Creek at Boulder Creek Monthly Flow Duration Curves, Wettest Years





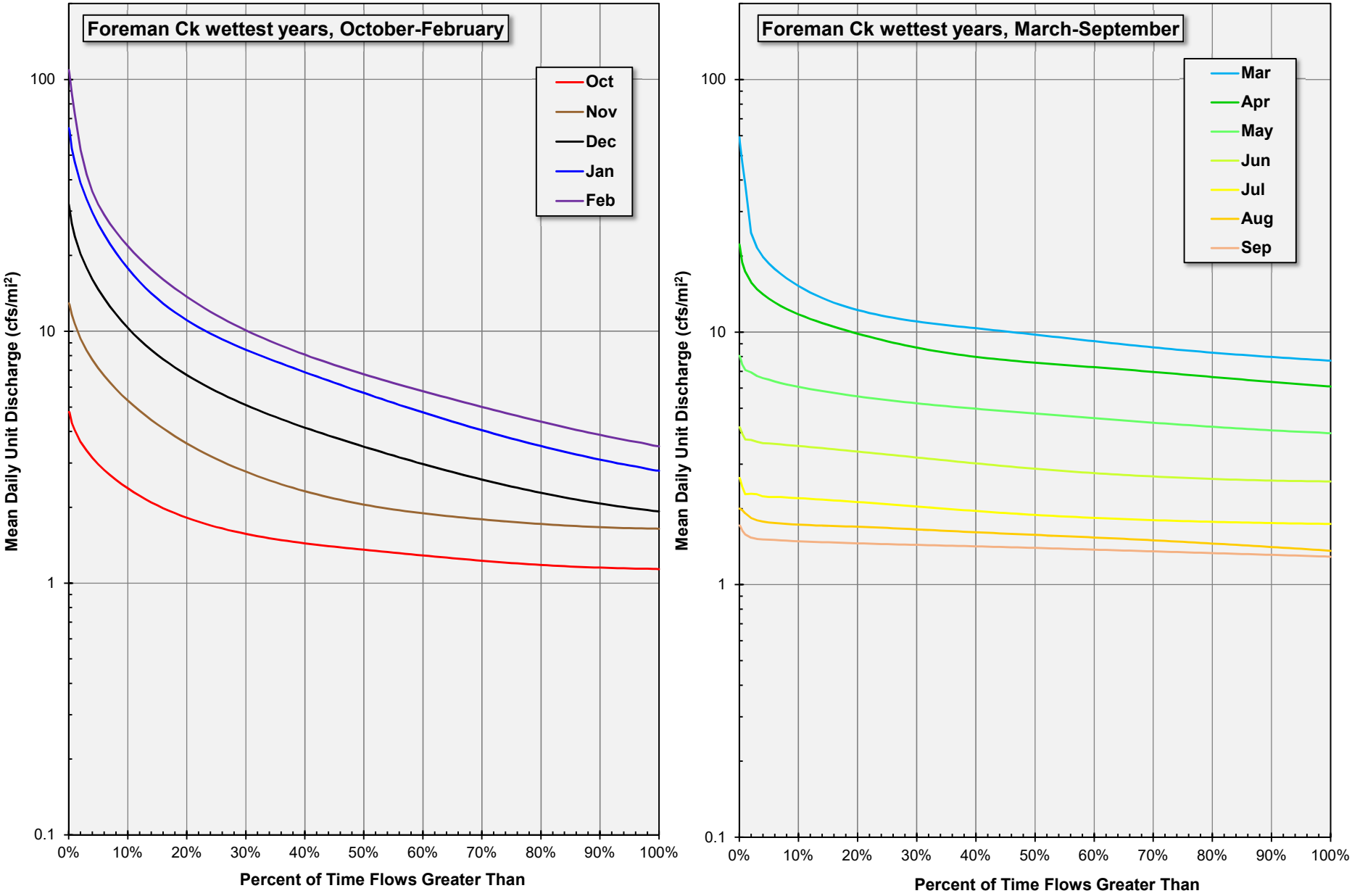
afm acre-feet per month
afy acre-feet per year

Figure 4-12
Boulder Creek Gauged versus Synthesized Annual Flows, WYs 1970–2017



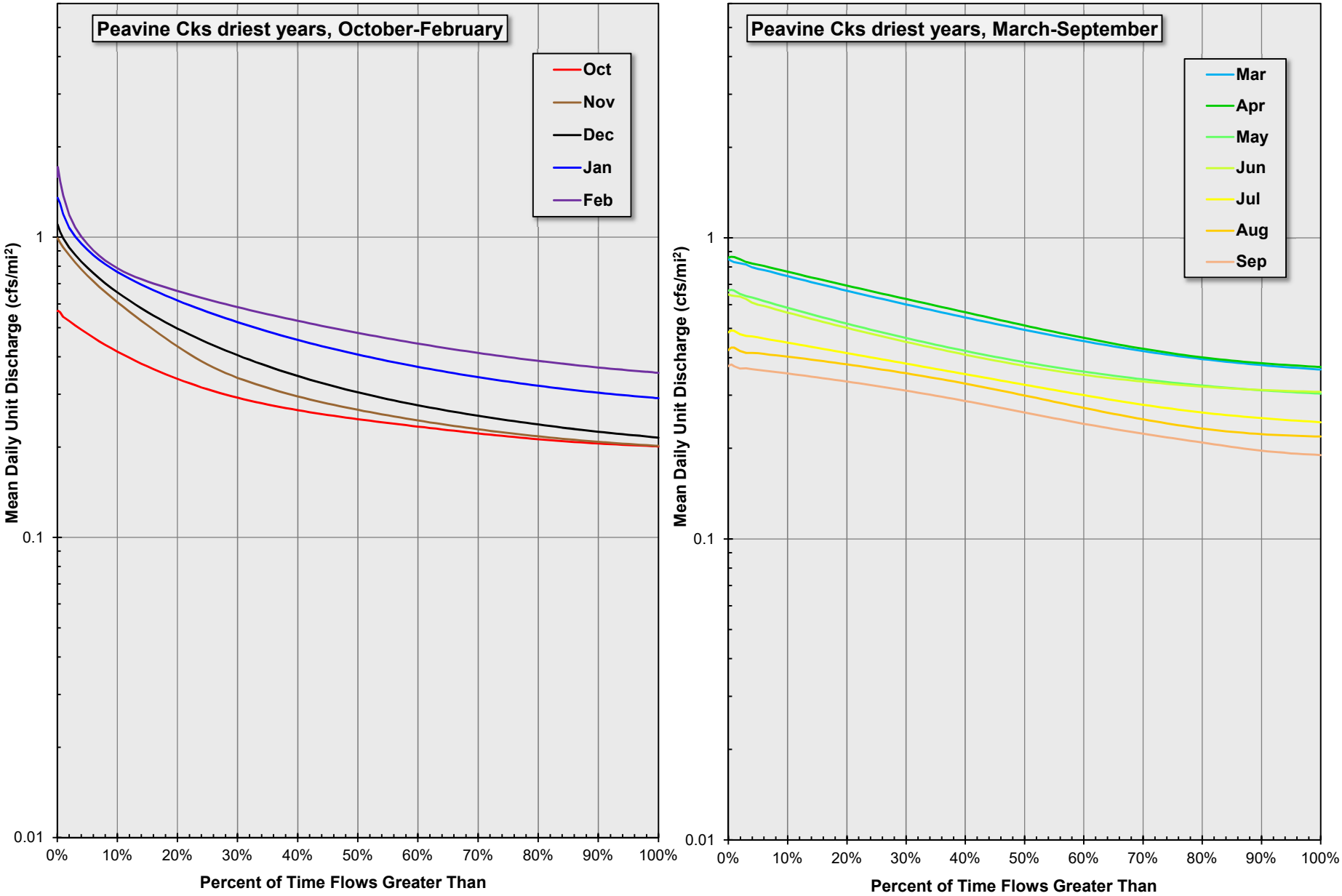
cfs/mi² cubic feet per second per square mile
Represents estimated total flow at point of diversion.

Figure 4-13
Foreman Creek Estimated Monthly Flow Duration Curves, Driest Years



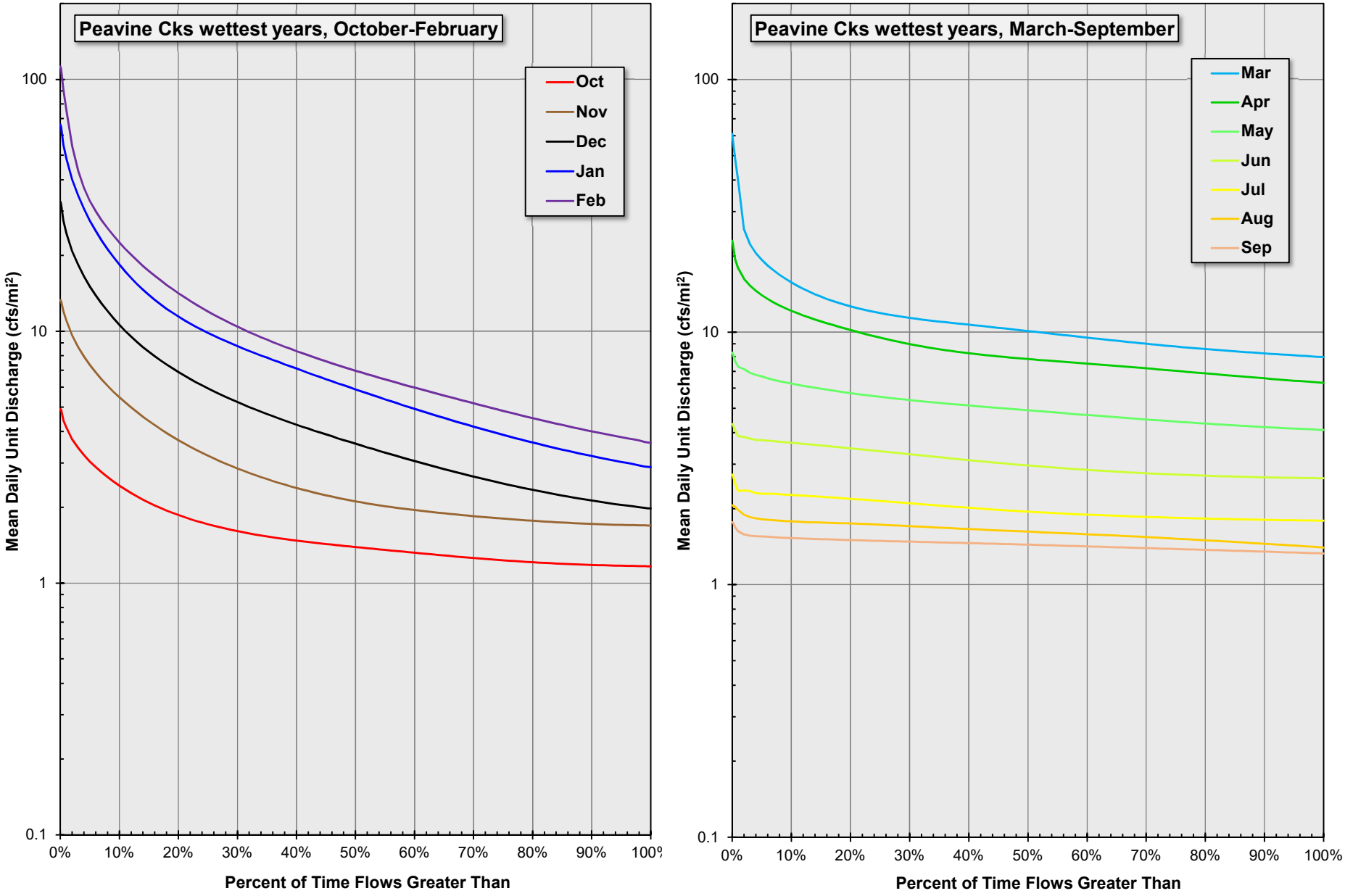
cfs/mi² cubic feet per second per square mile
Represents estimated total flow at point of diversion.

Figure 4-14
Foreman Creek Estimated Monthly Flow Duration Curves, Wettest Years



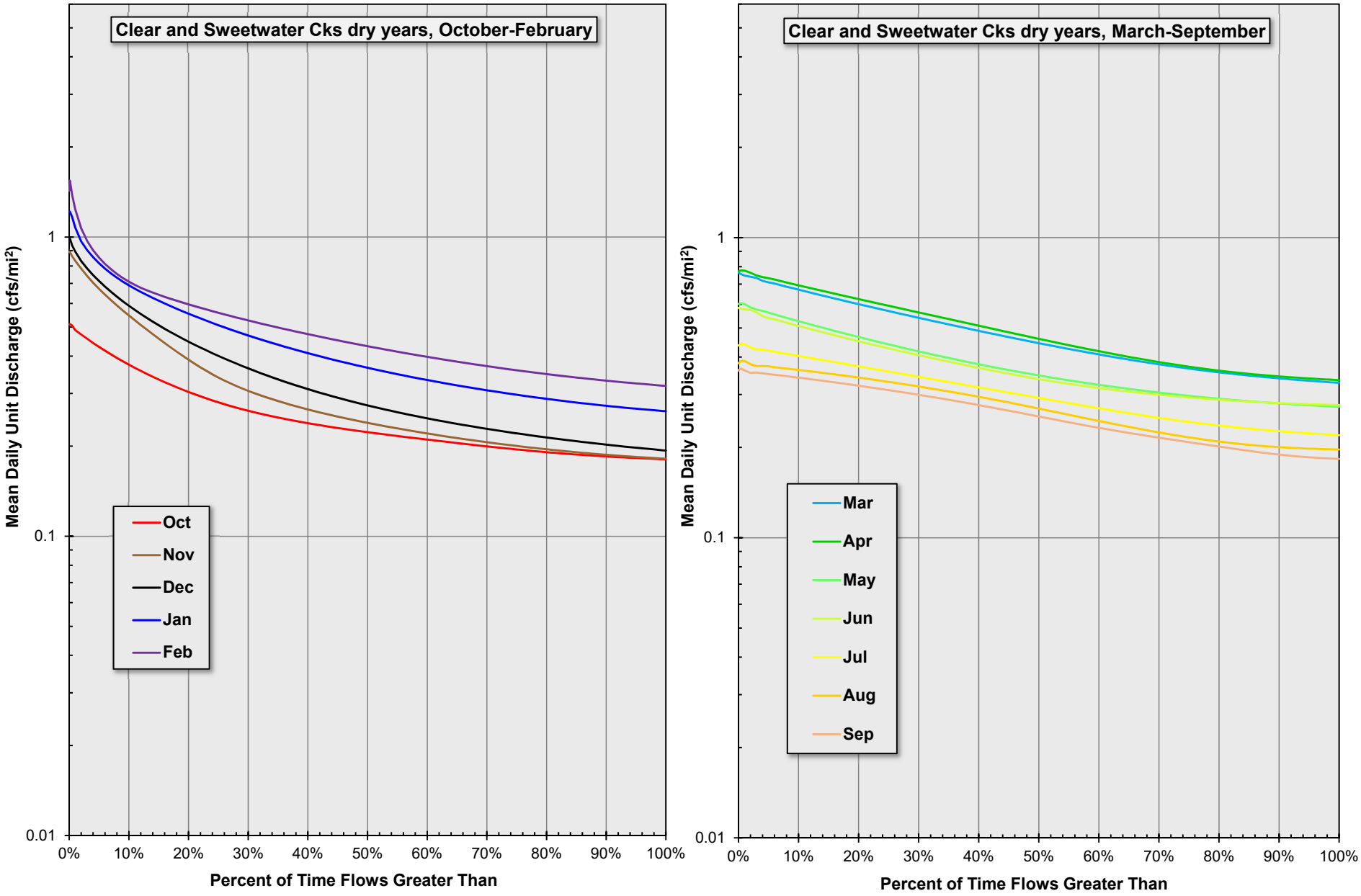
cfs/mi² cubic feet per second per square mile
Represents estimated total flow at point of diversion.

Figure 4-15
Peavine Creek Estimated Monthly Flow Duration Curves, Driest Years



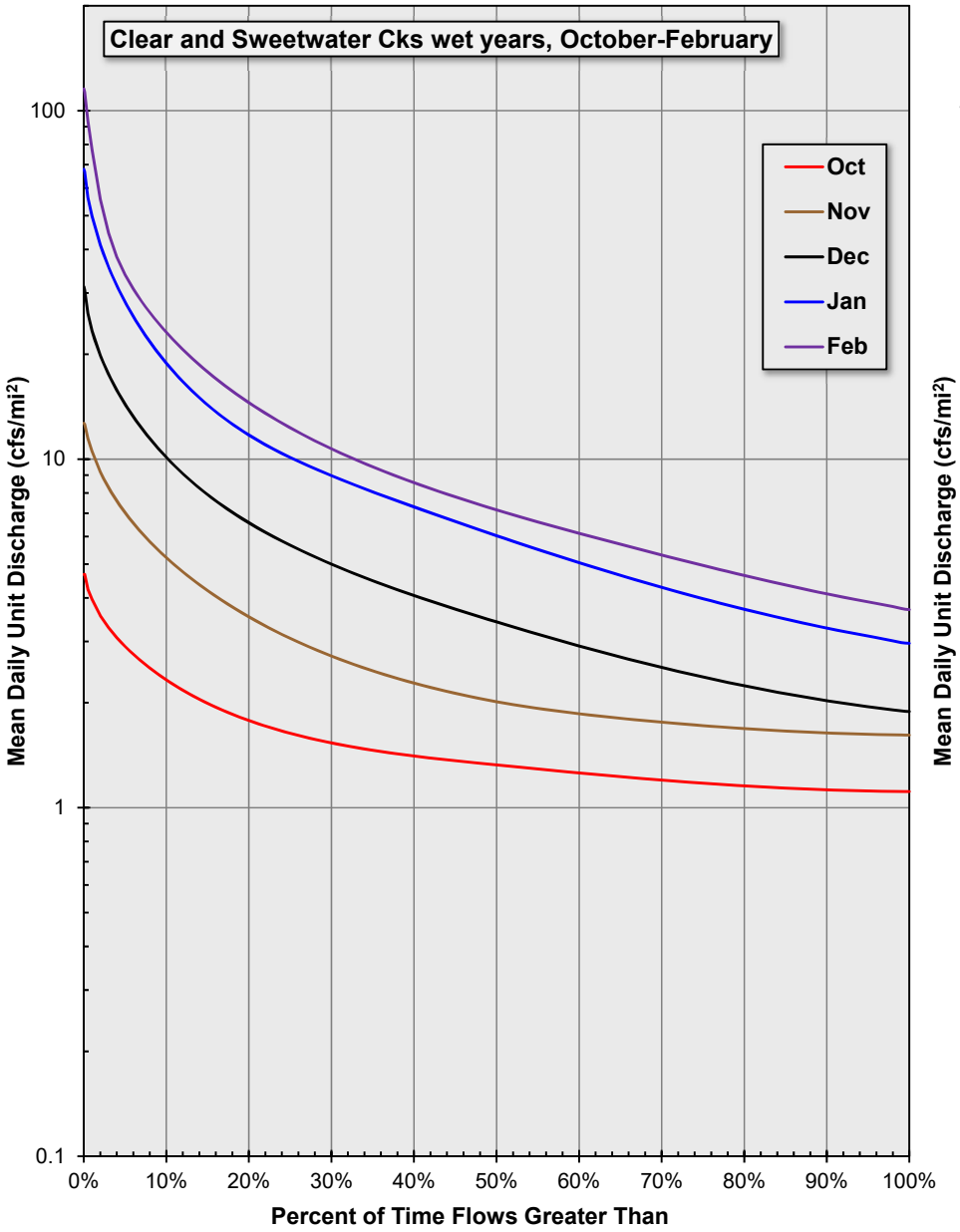
cfs/mi² cubic feet per second per square mile
Represents estimated total flow at point of diversion.

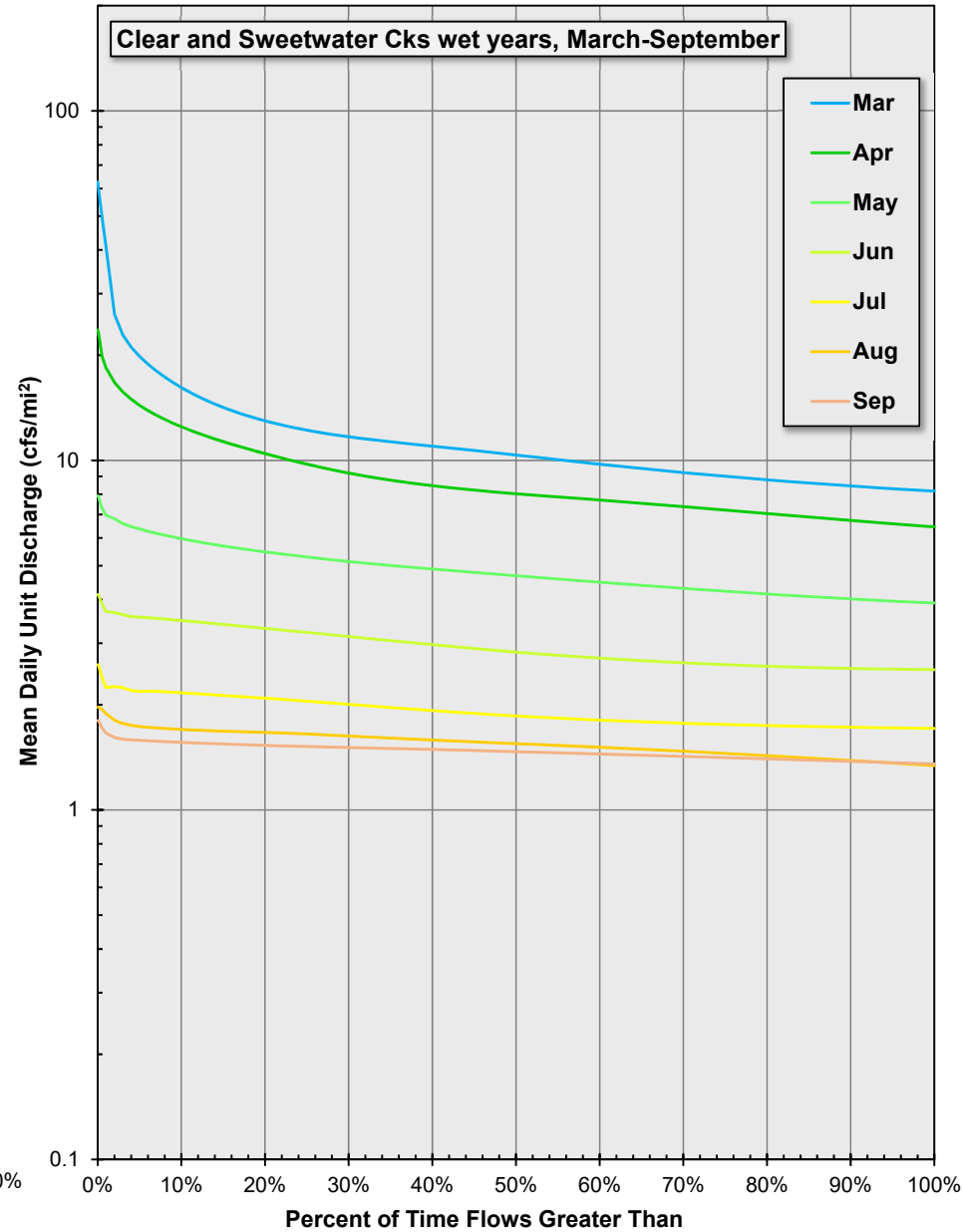
Figure 4-16
Peavine Creek Estimated Monthly Flow Duration Curves, Wettest Years



cfs/mi^2 cubic feet per second per square mile
Represents estimated total flow at point of diversion.

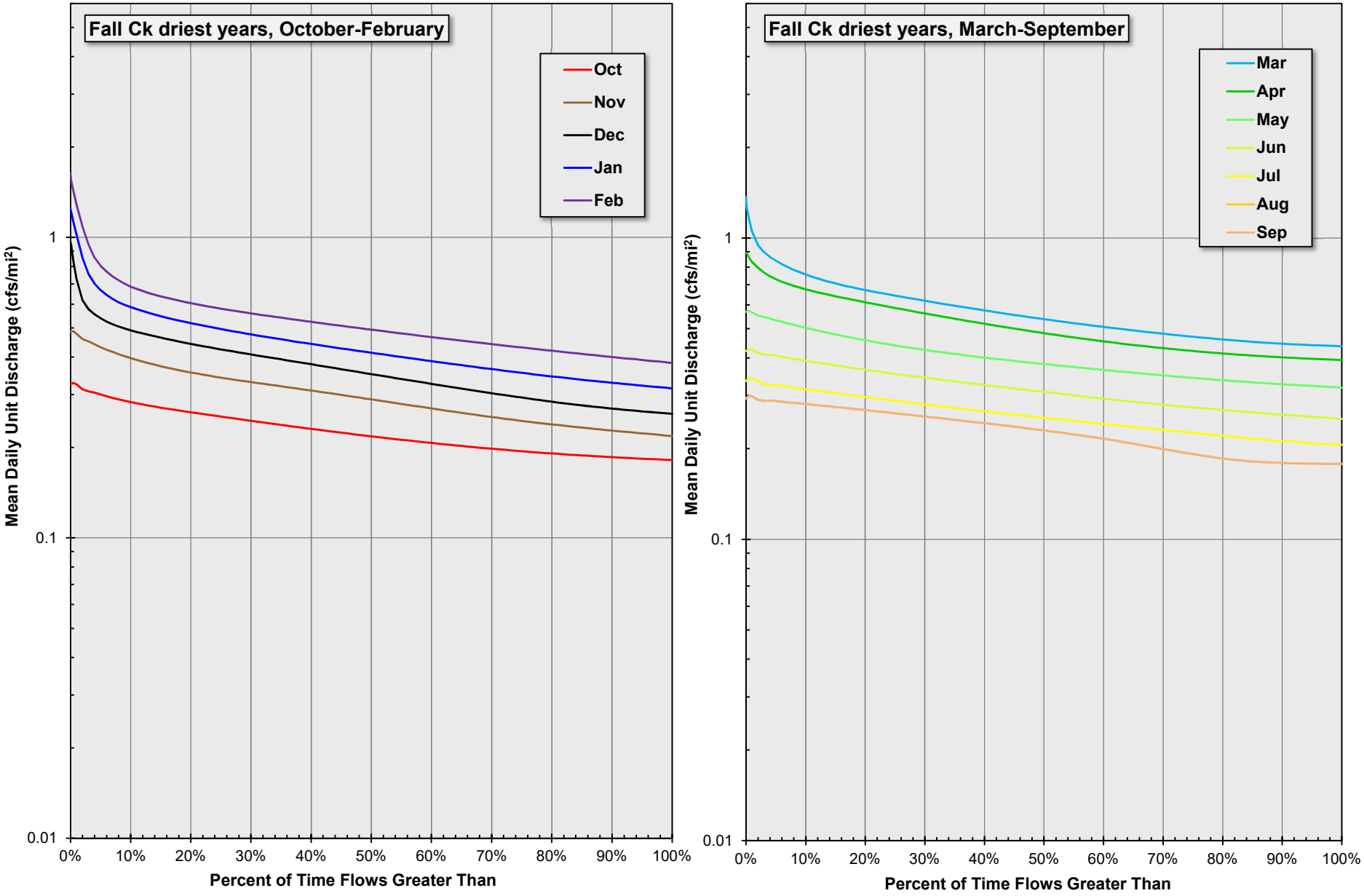
Figure 4-17
Clear and Sweetwater Creeks Combined Estimated Monthly Flow Duration Curves, Driest Years





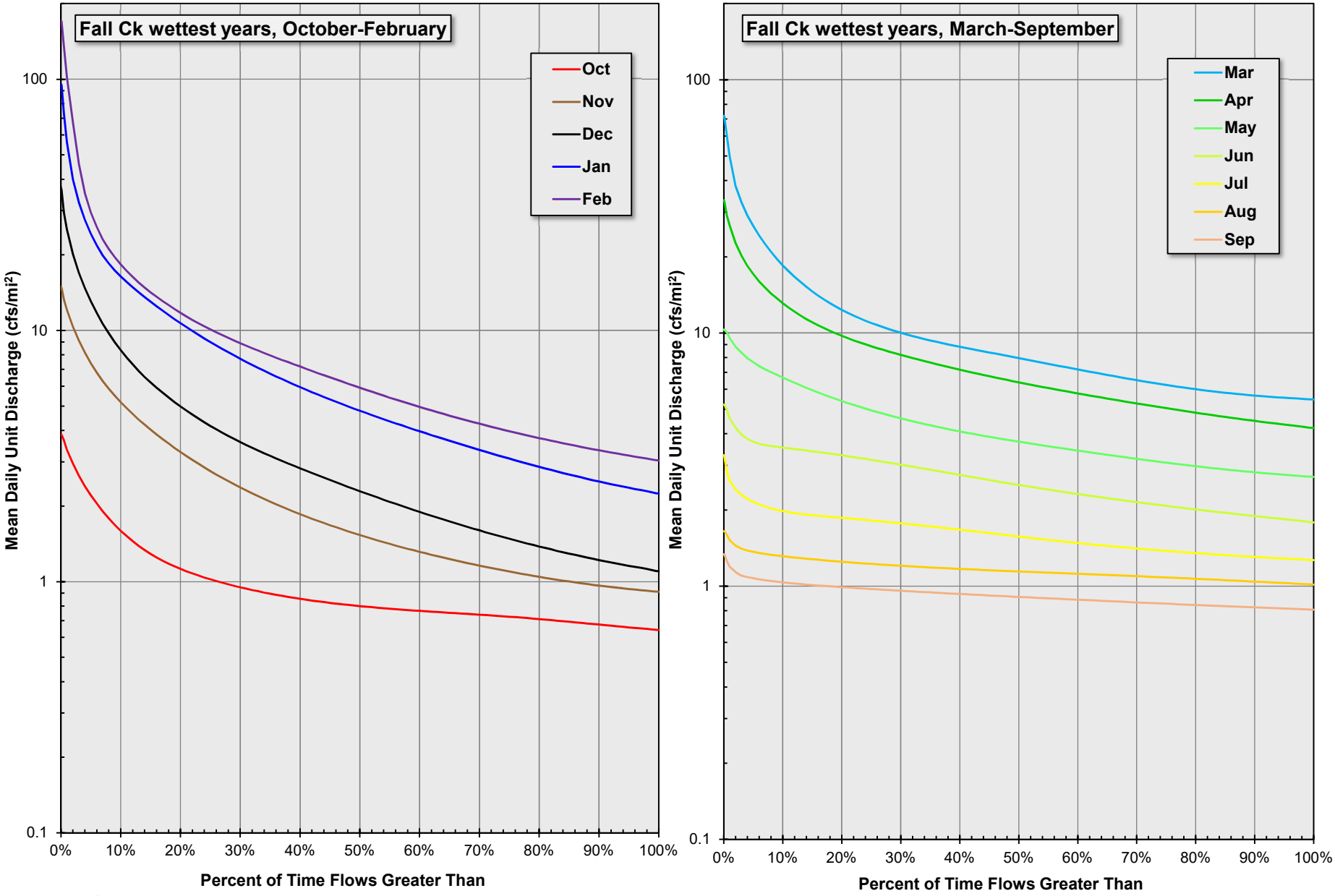
cfs/mi² cubic feet per second per square mile
Represents estimated total flow at point of diversion.

Figure 4-18
Clear and Sweetwater Creeks Combined Estimated Monthly Flow Duration Curves, Wettest Years



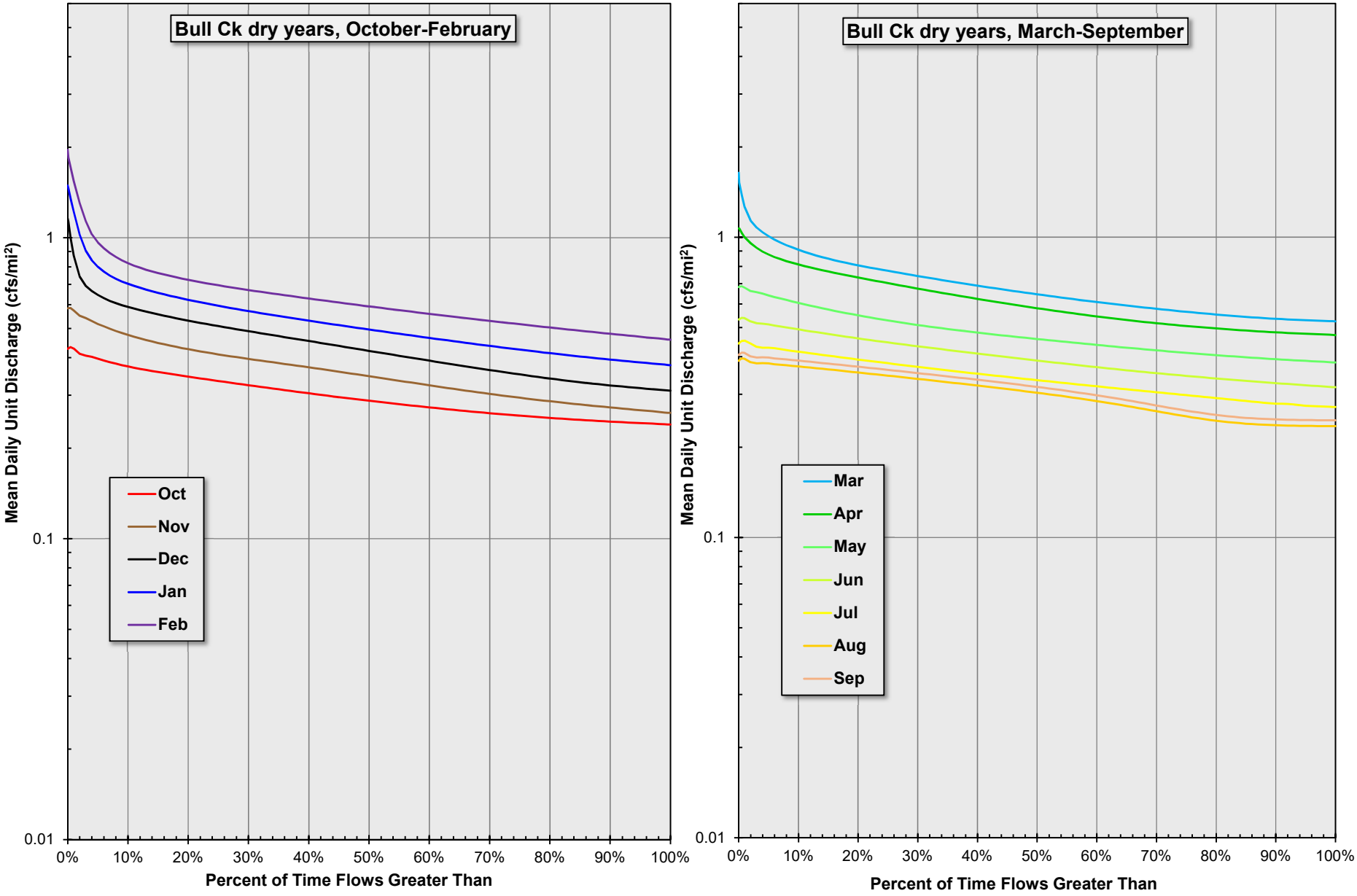
cfs/mi² cubic feet per second per square mile
Represents estimated total flow at point of diversion.

Figure 4-19
Fall Creek Estimated Monthly Flow Duration Curves, Driest Years



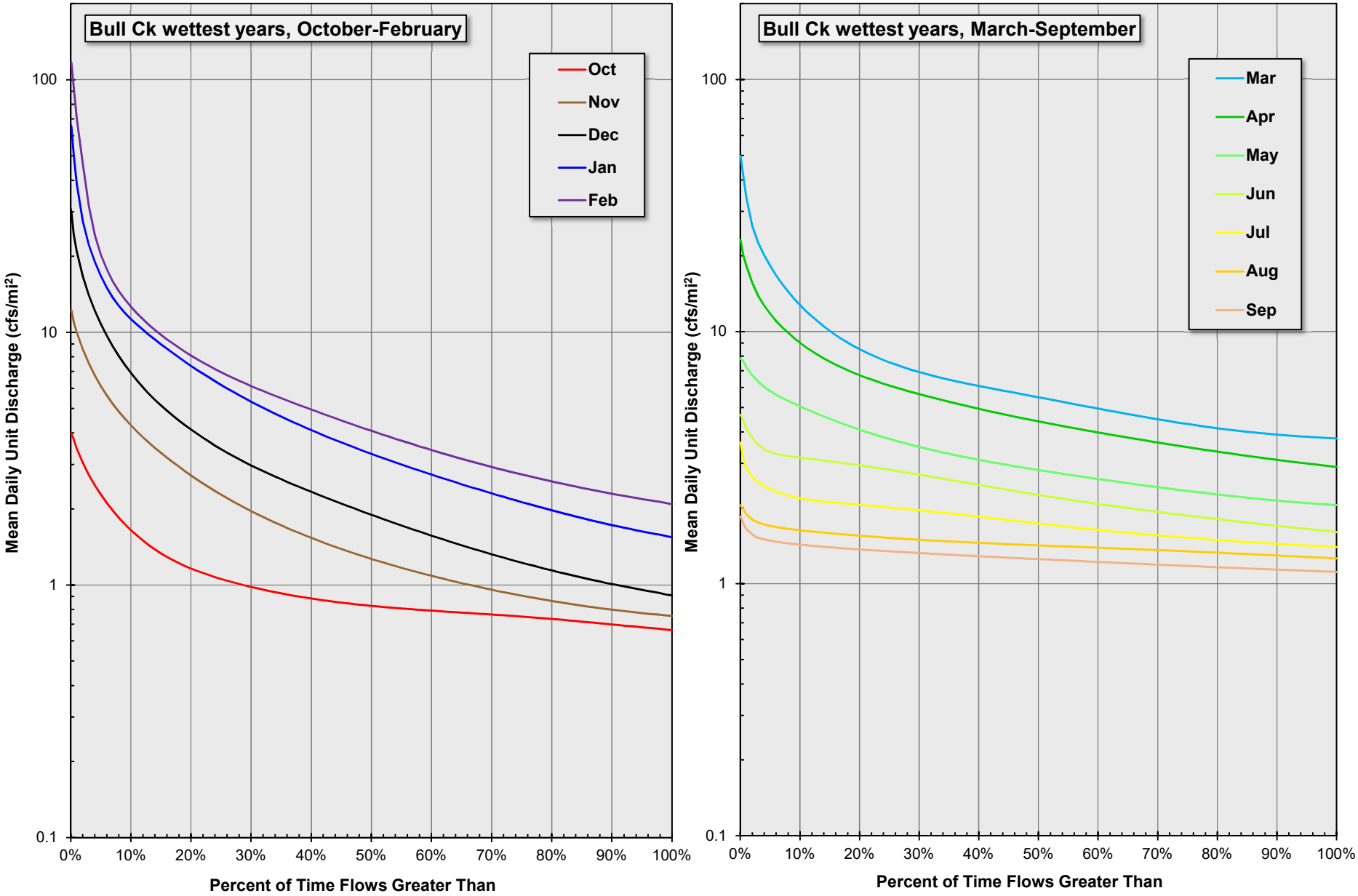
cfs/mi² cubic feet per second per square mile
Represents estimated total flow at point of diversion.

Figure 4-20
Fall Creek Estimated Monthly Flow Duration Curves, Wettest Years



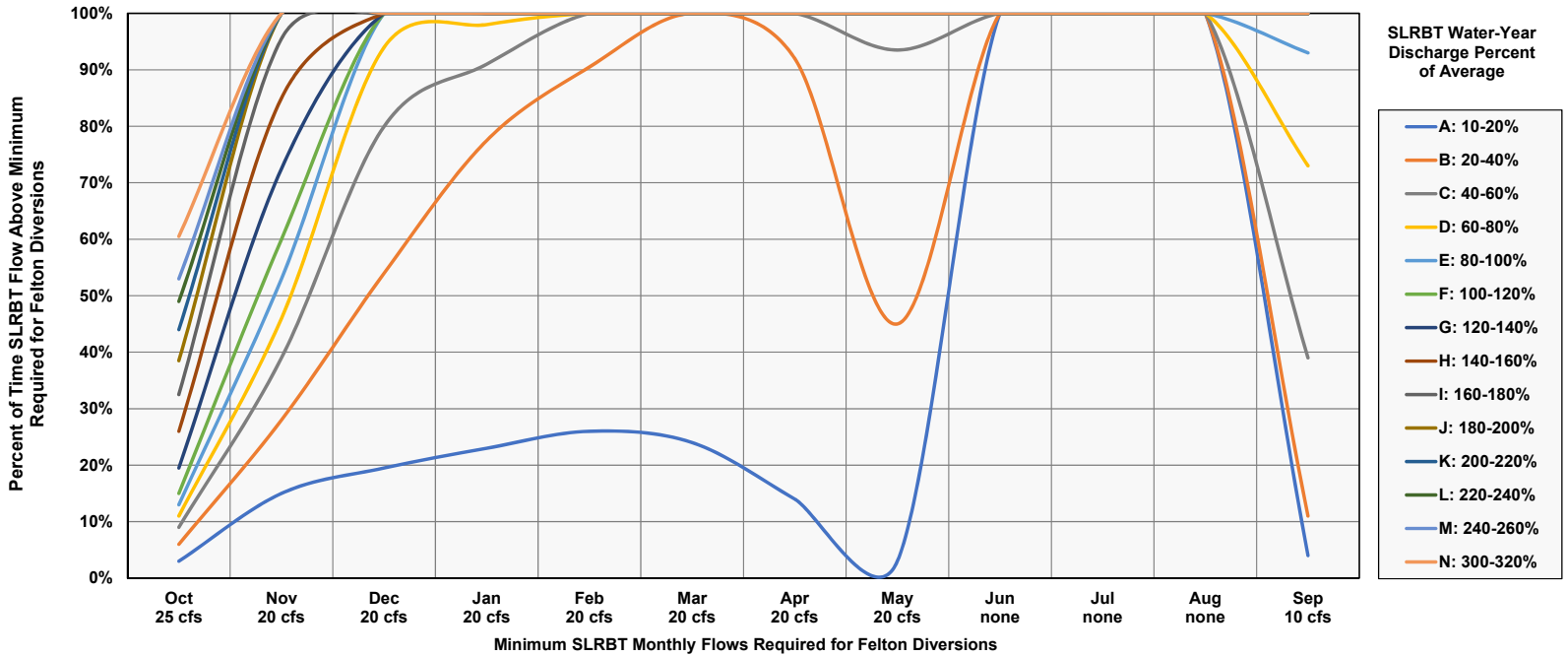
cfs/mi² cubic feet per second per square mile
Represents estimated total flow at point of diversion.

Figure 4-21
Bull Creek Estimated Monthly Flow Duration Curves, Driest Years



cfs/mi² cubic feet per second per square mile
Represents estimated total flow at point of diversion.

Figure 4-22
Bull Creek Estimated Monthly Flow Duration Curves, Wettest Years



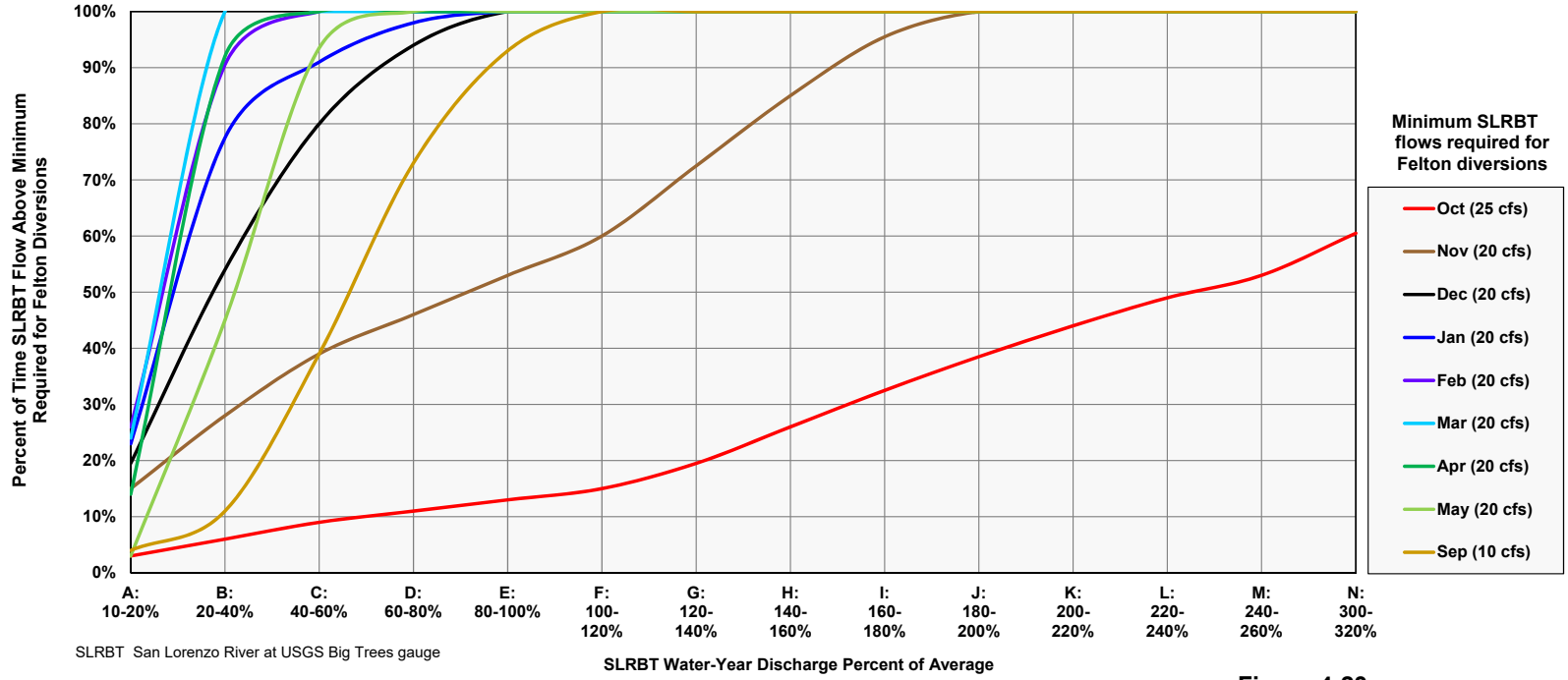
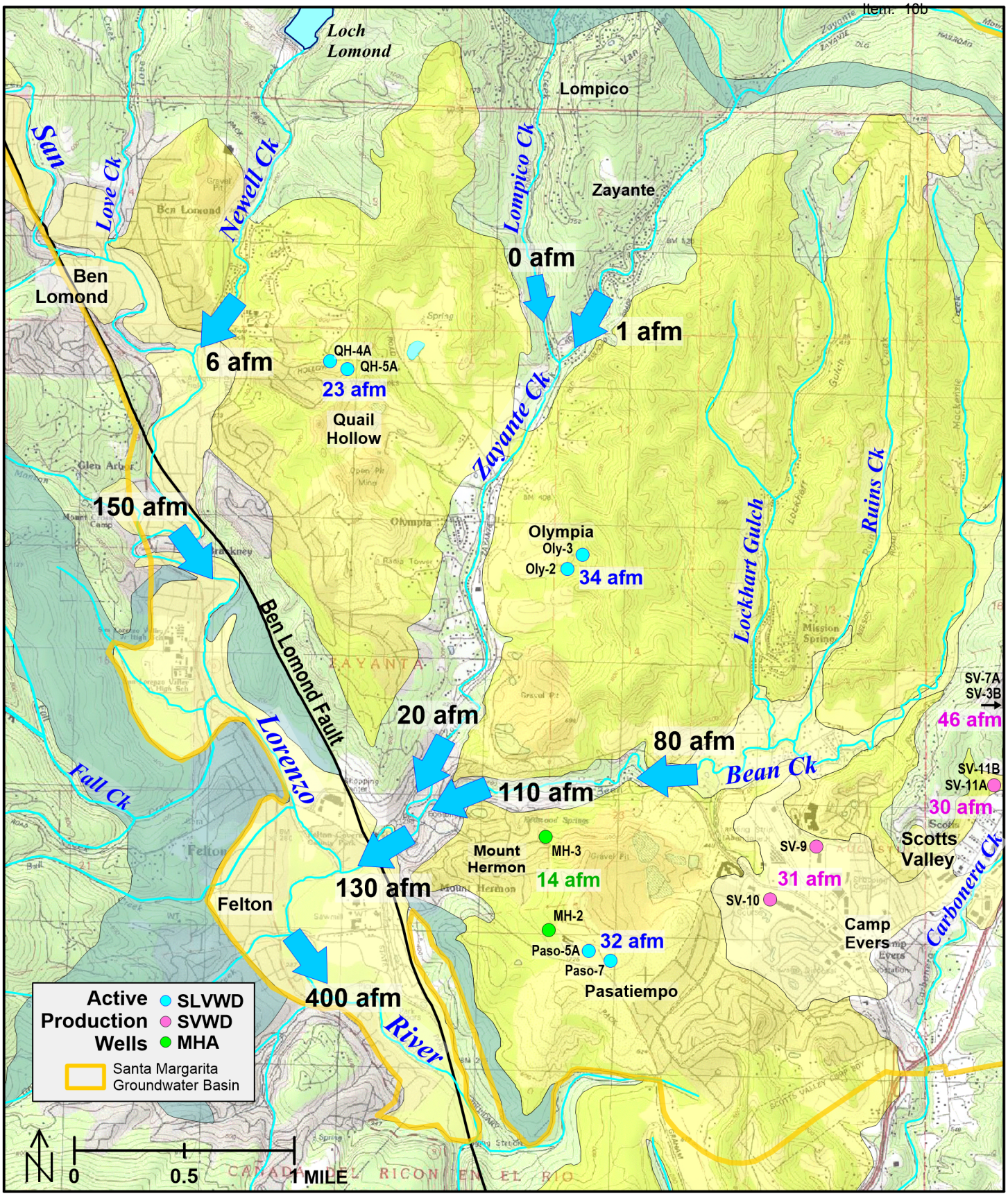


Figure 4-23
Estimated Percent of Time SLRBT Flows are Above Minimum Required for Felton Diversions (derived from SLRBT flow duration curves, Figures 4-6 and 4-7)



100 afm Rough estimate of drought minimum baseflow
(derived from Tables 4-6 through 4-11)

Average Monthly Groundwater Production (Table 5-3)
- **20 afm** SLVWD (WYs 2000-2017)
- **20 afm** SVWD (WYs 2010-2016)
- **20 afm** MHA (CYs 2008-2017)

afm acre-feet per month

Areal Extent of Permeable Units
- **Alluvium**
- **Santa Margarita Sandstone** (partially covered)
- **Lompico Sandstone** (outcrop only)

Figure 4-24
Approximate Drought Minimum Baseflows of Streams Bounding SLVWD Wells

5 Groundwater Resources

The map presented in Figure 5-1 identifies three loosely defined groundwater subareas from which SLVWD draws approximately 45 percent of its average annual water supply: the Quail Hollow and Olympia areas, each encompassing about 3 mi^2, and the approximately 2-mi^2 Pasatiempo area. These subareas occur within the 35-mi^2 SMGB and are distinguished in places by sandhills of exposed Santa Margarita Sandstone and associated aggregate quarrying. Quail Hollow groundwater is relatively separate from the other groundwater subareas, whereas the Olympia and Pasatiempo subareas are contiguous with the loosely defined Mission Springs, Camp Evers, and Scotts Valley groundwater subareas to the east.

5.1 SLVWD Groundwater Production

SLVWD typically operates two wells in each of the Quail Hollow, Olympia, and Pasatiempo subareas. Table 5-1 provides a summary of SLVWD's current and/or recent operating wells. The Quail Hollow and Olympia wells draw solely from separate portions of the Santa Margarita Sandstone aquifer, whereas the Pasatiempo wells draw predominantly from the underlying Lompico Sandstone aquifer (Figure 5-1).

Wells operated by SLVWD do not draw directly from alluvial aquifers and do not directly induce streamflow infiltration, consistent with area groundwater levels that are generally higher than the elevation of the gaining streams that dissect or bound the groundwater subareas (Figure 5-1). The Monterey Formation aquitard partially separates the Santa Margarita and Lompico sandstone aquifers from streams bounding and/or overlying the groundwater subareas. SLVWD's pumping wells may intercept groundwater flowing toward springs and streams, but generally do not draw streamflow into the aquifer. This distinction is important with regard to conjunctive use because it helps distinguish groundwater and surface water as somewhat separate sources.

Since WY 2000, SLVWD annual groundwater production has averaged approximately 280 afy from the Quail Hollow wells, 400 afy from the Olympia wells, and 380 afy from the Pasatiempo

wells (Table 3-1). The Quail Hollow and Olympia wells supply the North system and their use increases and decreases substantially in response to the availability of divertible streamflows (Figure 1-3). Since the 1970s, the Quail Hollow wells have experienced little if any long-term net decline in groundwater levels (Figure 5-2), whereas water levels in the Olympia wells have exhibited a slight long-term downward trend since the 1980s (Figure 5-3), suggesting that higher rates of extraction may be unsustainable without augmenting recharge.

As the sole water supply for the South system, production from SLVWD's Pasatiempo wells fluctuates with seasonal water demand. Pasatiempo groundwater levels have declined by as much as 200 ft since the early 1980s (Figure 5-4), consistent with long-term groundwater level declines throughout much of the general Scotts Valley area. Although well yields have been sufficiently reliable, replenishment of the aquifer through reduced pumping and possibly managed aquifer recharge is an expected outcome of future groundwater management under SGMA.

The simulation of alternative conjunctive use scenarios presented in Section 6 generally assumes that each well can produce continuously up to its capacity as needed when surface water supplies are insufficient. Based on information presented in Section 3, the combined wellfield capacities are assumed to be:

	gpm
Quail Hollow wells:	500
Olympia wells:	780
Pasatiempo wells:	450

Lower capacities are assumed for particular months of the climatic cycle based on detailed plots of monthly groundwater levels, pumping, and precipitation in relation to pump intake and well screen elevations. These plots are provided in Figures 5-5, 5-6, and 5-7 for the Quail Hollow, Olympia, and Pasatiempo wells, respectively. Reduced well capacities are indicated when water levels are drawn down to the elevation of the pump intake, typically during drought periods with heavy demand (such as during the early years of a drought before conservation reduces demand). Based on inspection of these plots and the groundwater level and production record

summarized in Table 5-2, the capacities of the Quail Hollow and Olympia wells are assumed to decline in as many as three monthly steps to as low as 250 and 475 gpm, respectively, during the following months of the climactic cycle: July–September 1977; July–August 1989; July–September 1990; May–October 1991; May–September 1992; June–October 2008; June–October 2009; June–September 2014; May–November 2015; and May–October 2016.

5.2 Potential Effects of Groundwater Pumping on Stream Baseflow

As stated above in Section 5.1, SLVWD's wells may intercept groundwater flowing toward springs and streams, but generally do not draw water directly from streams. For this reason, and because of the slow rate of groundwater flow, it is reasonable to evaluate the potential effects of groundwater pumping by comparing rates of average annual pumping to minimum rates of stream baseflow. This implies there is effectively no difference between summer and winter groundwater pumping with regard to the potential effects on stream baseflow. A more refined evaluation of potential surface water-groundwater interactions would require the use of a numerical groundwater flow model, which was beyond the scope of this study.

Table 5-3 compares estimates of minimum monthly impaired baseflow from Section 4.4 with recent average monthly groundwater pumping rates. Because the effects of pumping are already reflected in the gauged and estimated streamflow records, the potential percent reduction in minimum monthly baseflow is calculated as the average groundwater pumping rate divided by the combined rates of baseflow and pumping. Subtracting this fraction from 1 and multiplying by 100 percent gives the estimated percent of baseflow remaining as a result of pumping. Based on this method, average rates of SLVWD, SVWD, and MHA groundwater pumping may reduce Newell, Zayante, and Bean Creek baseflows by as much as roughly 50 percent during worst case drought conditions (Table 5-3).

Well Name	Abbrev-iation	Year Drilled	Ground Surface or Ref. Pt. Elev. (ft msl)	Well Diameter Bor-ing (in)	Well Diameter Cas-ing (in)	Depth: Com-pleted Well (ft bgs)	Depth: Sani-tary Seal (ft bgs)	Depth: Grav-el Pack (ft bgs)	Screened Intervals Depth (ft bgs)	Screened Intervals Total Length (ft)	Screened Intervals Total Inter-val (ft)	Aquifer[a]	Pump Size (hp)	Pump Suc-tion Intake (ft bgs)
North System Wells														
Quail Hollow 4A	QH-4A	2001	597	22	12	260	120	266	180 - 250	70	70	Tsm	20	237
Quail Hollow 5A	QH-5A	2000	*516*	22	12	174	112	174	124 - 164	40	40	Tsm	20	155
Olympia 2	Oly-2	1981	525	24	12	310	160	325	230 - 250 280 - 300	20 20	70	Tsm	60	279
Olympia 3	Oly-3	1990	538	24	12	310	160	340	230 - 300	70	70	Tsm	60	279
South System Wells														
Pasatiempo 5A	Paso-5A	2012	750	24	12	710			400 - 700	300	300	Tlo		
Pasatiempo 6[b]	Paso-6	1990	775	24	12	790	381	805	560 - 580 600 - 620 710 - 770	20 20 60	210	Tlo	60	700
Pasatiempo 7[b]	Paso-7	1990	734	24	12	540	260	560	380 - 440 495 - 525	60 30	145	Tlo	60	535
Pasatiempo 8[c]	Paso-8	2018	-	-	-	-	-	-	- -	-	-	-	-	-
Manana Woods 1 *(inactive)*	MWd-1	1988	516	18	10	380	160	405	190 - 210 240 - 280 320 - 360	20 40 40	170	Tlo		

[a]Aquifers: Tsm = Santa Margarita Sandstone; Tlo = Lompico Sandstone.

[b]Wells to be replaced with Paso-8.

[c]Under construction as of October 2018.

ft bgs feet below ground surface
ft msl feet elevation above sea level
hp horsepower
in inchres

Table 5-1
SLVWD Groundwater Production Wells

CY	WY Rain-fall % of Avg.*	Year of Drought	Drought Cumu-lative % of Avg.	Diversions					Quail Hollow Wells				Olympia Wells			
				Maximum		Minimum		Base-flow reces-sion	Maximum		Minimum During Dry, Heavy-Use Period		Maximum		Minimum During Dry, Heavy-Use Period	
				gpm	month	gpm	month	months	gpm	month	gpm	month	gpm	month	gpm	month
1985	83%	-	-	813	Dec	282	Sep	6	496	Oct	436	Jul	454	Aug	380	Sep
1986	138%	-	-	882	May	264	Dec	7	511	Jul	314	Dec	300	Aug	115	Nov
1987	55%	1	55%	606	Apr	123	Oct	6	511	Aug	399	Oct	540	Aug	373	Oct
1988	62%	2	59%	630	Feb	108	Sep	8	430	Aug	380	Oct	527	Jul	500	Sep
1989	71%	3	63%	766	Apr	229	Sep	4	352	Jul	264	Sep	527	Jul	422	Sep
1990	50%	4	60%	682	Nov	158	Dec	15	370	Dec	210	Oct	522	Oct	443	Jul
1991	66%	5	61%	733	Apr	163	Oct	8	365	May	258	Sep	544	Sep	508	Oct
1992	85%	6	65%	694	Apr	182	Nov	6	298	Aug	207	Jul	609	Aug	453	Oct
1993	119%	-	72%	871	Apr	182	Nov	7	243	Oct	192	Aug	473	Jul	310	Nov
1994	68%	7	72%	748	Mar	199	Sep	6	298	Jul	229	Sep	779	Aug	659	Sep
1995	142%	-	-	832	Jul	215	Oct	4	208	Oct	177	Sep	505	Oct	325	Sep
1996	125%	-	-	805	Jul	482	Nov	4	223	Jul	128	Sep	456	Jul	318	Oct
1997	120%	-	-	805	Mar	362	Aug	6	266	Jul	211	Sep	603	Sep	466	Jul
1998	170%	-	-	1,011	Jul	600	Nov	3	128	Jul	124	Oct	326	Sep	264	Oct
1999	95%	-	-	955	Jun	424	Oct	4	163	Jul	145	Oct	473	Sep	389	Jul
2000	116%	-	-	924	May	413	Oct	5	206	Aug	132	Oct	570	Sep	342	Oct
2001	77%	1	77%	810	Mar	253	Oct	5	306	Aug	231	Oct	708	Sep	575	Oct
2002	97%	2	87%	807	Apr	207	Sep	3	353	Oct	353	Oct	713	Aug	492	Oct
2003	101%	-	-	918	May	230	Nov	5	424	Sep	286	Nov	704	Aug	549	Oct
2004	91%	-	-	972	Apr	317	Oct	6	401	Jul	328	Oct	654	Aug	407	Oct
2005	137%	-	-	947	May	374	Nov	5	545	Jul	231	Oct	523	Aug	424	Oct
2006	153%	-	-	983	May	376	Oct	5	421	Jul	334	Oct	570	Sep	342	Oct
2007	60%	1	60%	892	Mar	248	Oct	8	388	Jun	342	Sep	712	Jun	506	Oct
2008	80%	2	70%	835	Apr	161	Oct	6	383	Aug	344	Sep	764	Aug	559	Oct
2009	79%	3	73%	770	Apr	216	Sep	4	341	Jul	304	Sep	590	Sep	563	Jul
2010	116%	-	-	908	Jun	326	Oct	4	353	Sep	214	Oct	328	Sep	275	Oct
2011	127%	-	-	963	Jul	407	Nov	6	219	Dec	122	Oct	314	Sep	183	Oct
2012	78%	1	78%	845	May	197	Nov	6	231	Oct	165	Sep	649	Sep	424	Oct
2013	76%	2	77%	748	Mar	170	Jan	9	376	May	284	Aug	734	Jul	454	Oct
2014	40%	3	64%	574	Mar	88	Dec	7	333	Nov	207	Sep	522	Jul	454	Oct
2015	71%	4	66%	610	Jan	108	Sep	10	288	Aug	224	Oct	501	Oct	408	Sep
2016	96%	5	72%	864	May	84	Oct	4	325	Sep	186	Oct	516	Oct	400	Aug
2017	194%	-	-	926	Mar	296	Oct	4	325	Jun	182	Oct	525	Sep	324	Aug
Avg	98%	-	-	822	-	256	-	-	336	-	247	-	553	-	412	-
Min	40%	-	-	574	-	84	-	-	128	-	122	-	300	-	115	-
Max	194%	-	-	1,011	-	600	-	-	545	-	436	-	779	-	659	-

Drought period.

Yield potentially diminished during drought.

* Percent of average for WYs 1970-2017.
gpm gallons per minute

CY calendar year
WY water year

Table 5-2

Evaluation of North System Water Production During Drought

Wellfield	Average Monthly Ground-water Produc-tion[a]	Assumed Distribution of Pumping Effects									
		San Lorenzo River		Newell Creek		Zayante Creek		Bean Creek		All or Other Streams	
	afm	%	afm	%	afm	%	afm	%	afm	%	afm
SLVWD Quail Hollow wells	23	25%	6	25%	6	50%	12	-		-	
SLVWD Olympia wells	34	-		-		33%	11	67%	23	-	
SLVWD Pasatiempo wells	32	-		-		-		100%	32	-	
Mt. Hermon Association wells	14	-		-		-		100%	14	-	
SVWD wells 9,10A,11A,11B	61	-		-		-		100%	61	-	
SVWD wells 3B, 7A	46	-		-		-		?		100%	46

Stream	Minimum Drought Baseflows[b]	Percent of Drought Minimum Baseflow Remaining as a Result of Pumping[c]			
	afm	SLVWD	MHA	SVWD	Total
Newell Creek at San Lorenzo River	6	51%	-	-	-
Zayante Creek above Bean Creek	20	47%	-	-	-
Bean Creek at Zayante Creek	110	77%	94%	75%	46%
Zayante Creek at SLR	130	73%	95%	78%	46%
San Lorenzo River above Fall Creek	150	93%	-	-	-
San Lorenzo River at USGS gage	400	84%	98%	89%	71%

afm acre-feet per month

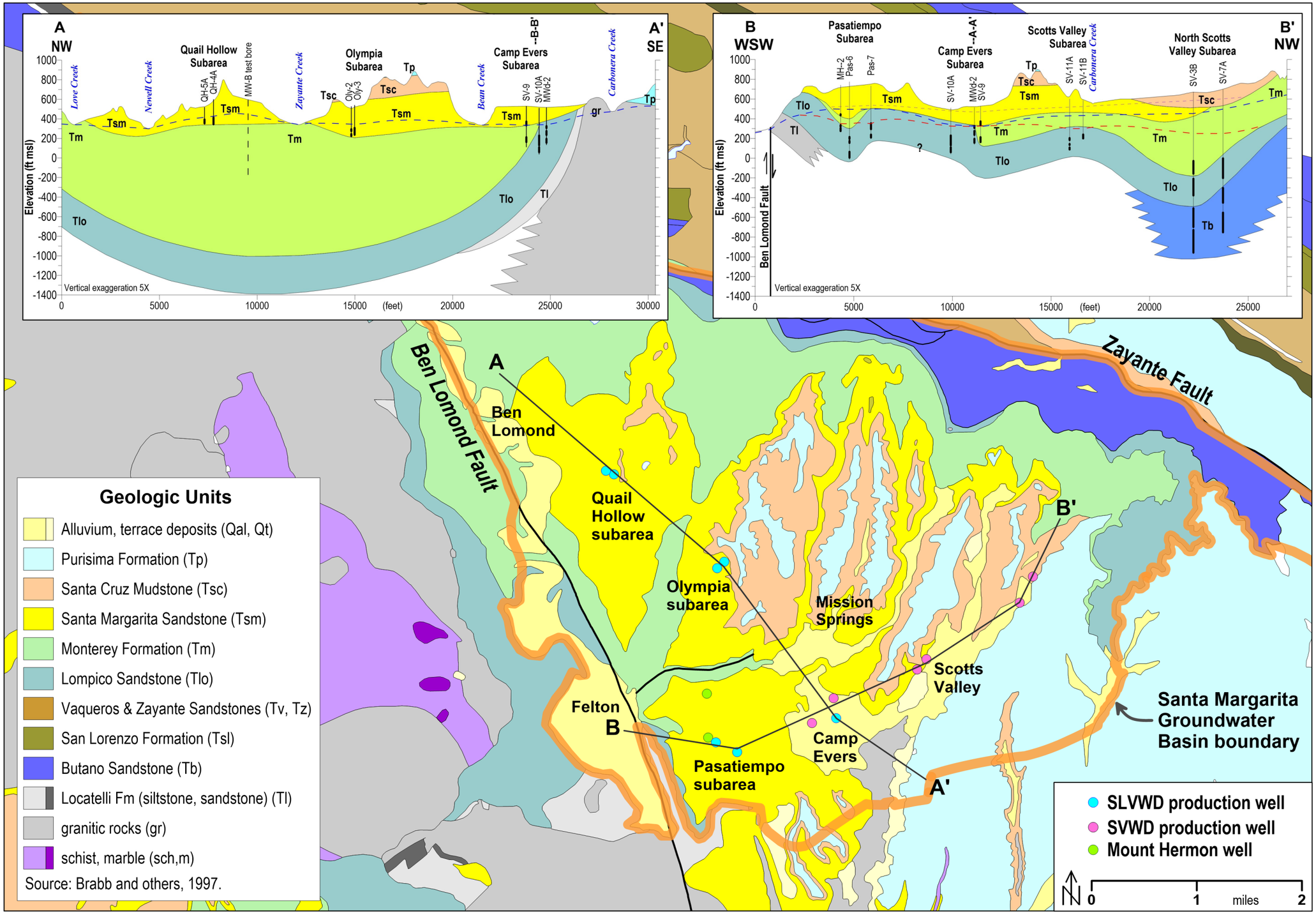
[a] Periods represented by average pumping:
SLVWD: WYs 2000-2017 (derived from data presented in Table 3-1)
SVWD: WYs 2010-2016 (derived from SVWD WY 2016 Annual Report Table 5)
MHA: CYs 2008-2017 (data provided by MHA)

[b] Estimated from Tables 4-4 and 4-7 through 4-11, as presented in Figure 5-14.

[c] Calculated as: 100 x {1 - [(pumping) ÷ (baseflow + pumping)]}

Estimated impacts from SLVWD, SVWD, and MHA groundwater pumping only.

Table 5-3
Percent of Drought Minimum Baseflow Remaining as a Result of Assumed Distribution of Groundwater Pumping Effects



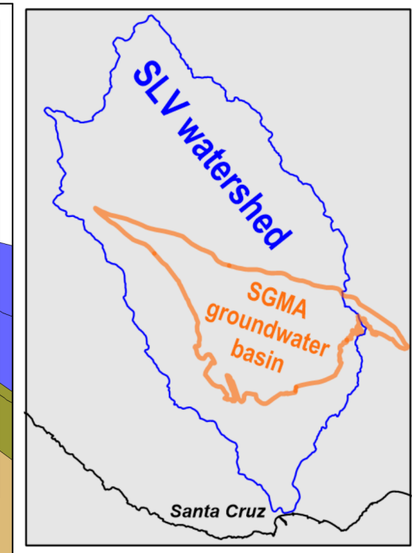
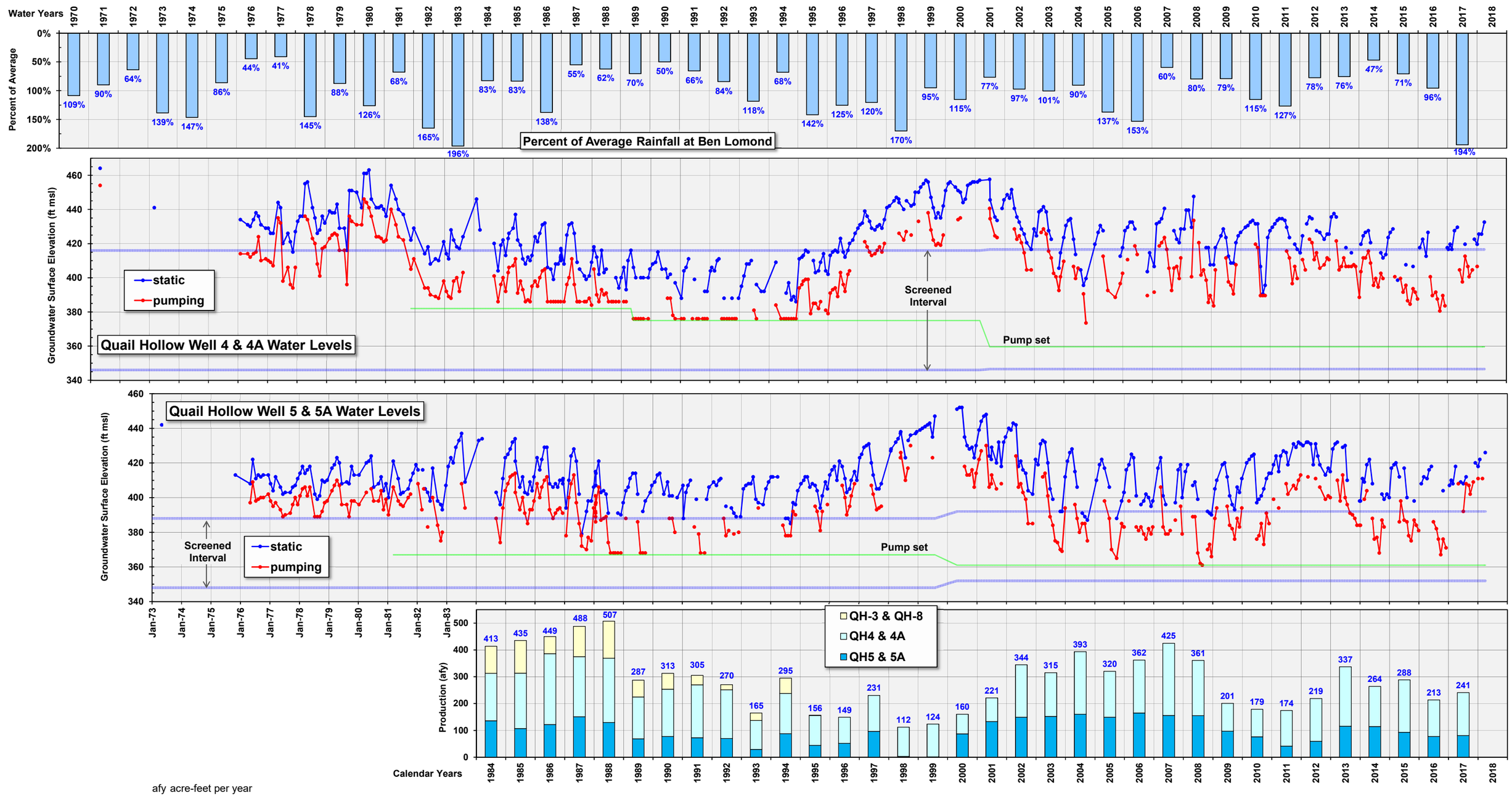
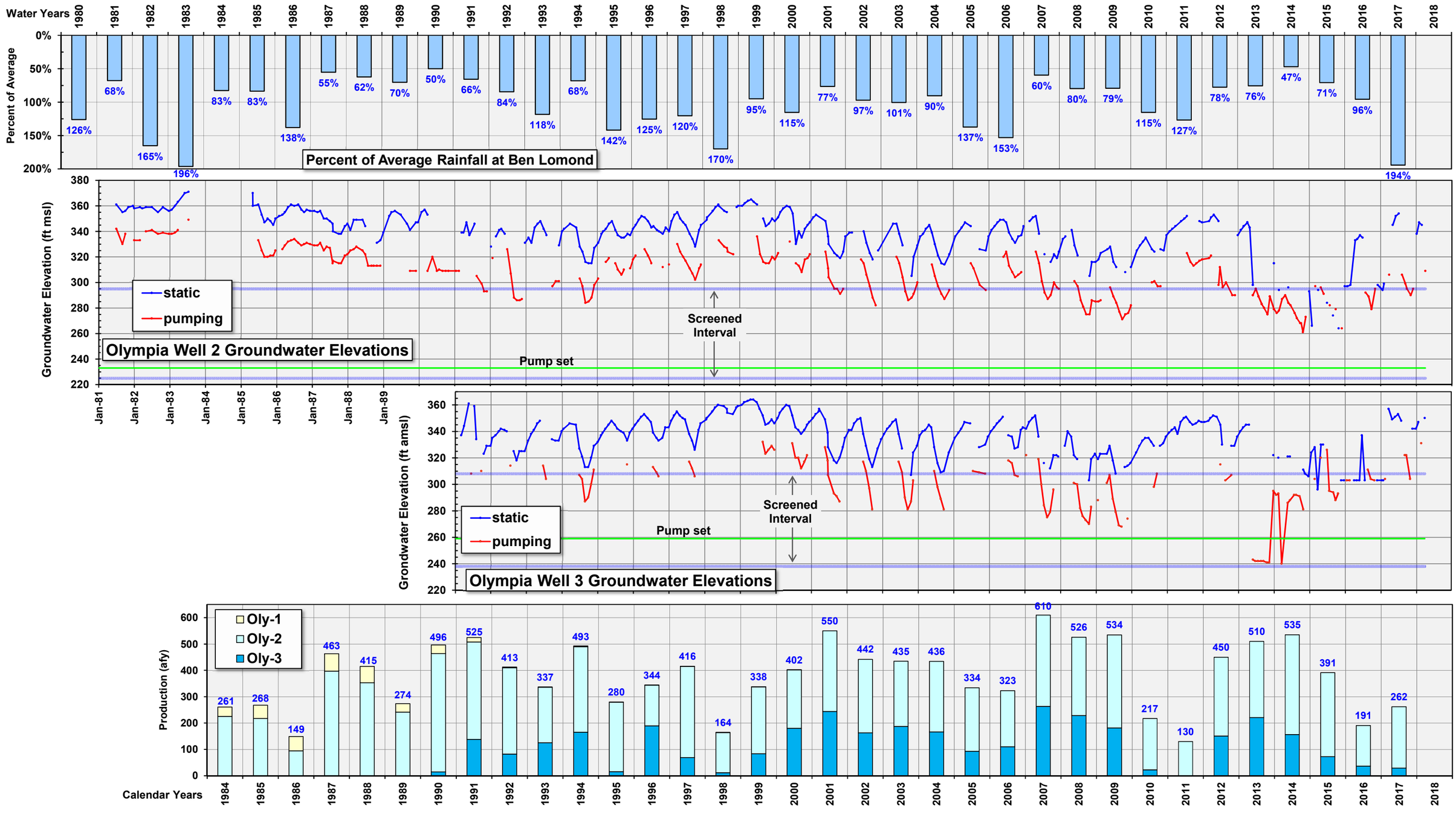


Figure 5-1
SLVWD Groundwater Subareas



afy acre-feet per year
ft msl elevation in feet above mean sea level

Figure 5-2
SLVWD Quail Hollow Wells Groundwater Levels and Annual Pumping and Precipitation, 1970-2018

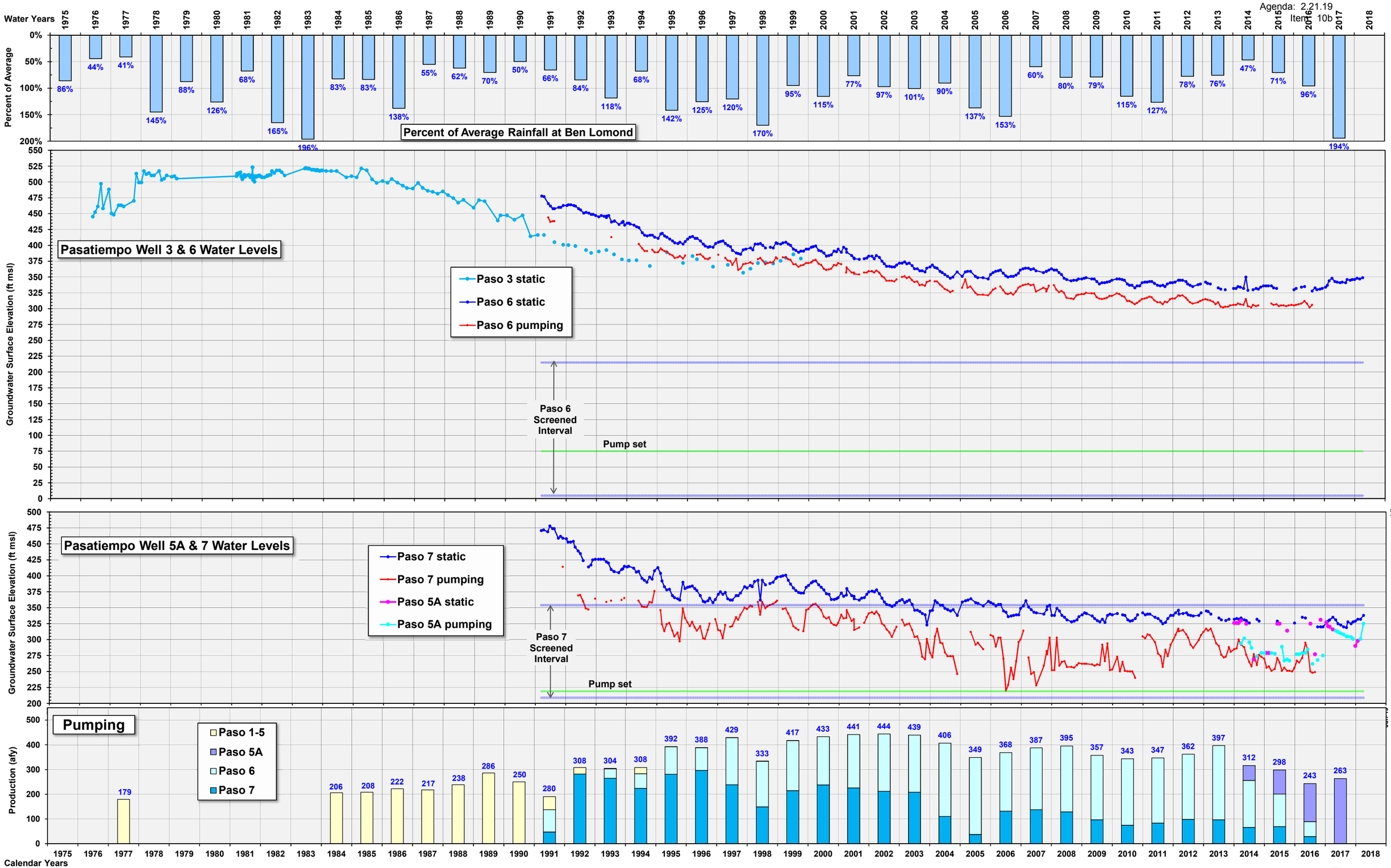


afy acre-feet per year

ft msl elevation in feet above mean sea level

Figure 5-3

SLVWD Olympia Wells Groundwater Levels and Annual Pumping and Precipitation, 1980-2018

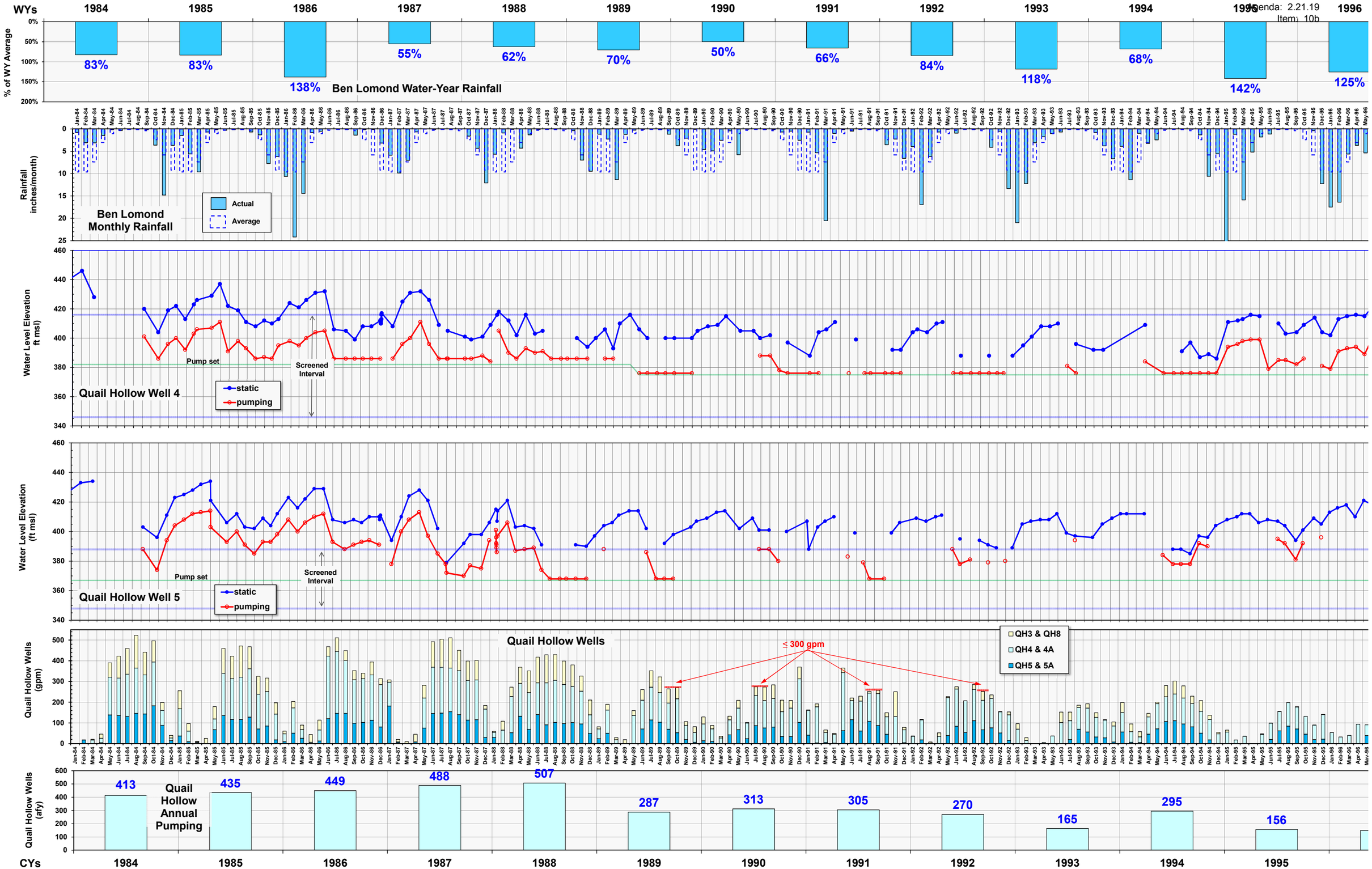


afy acre-feet per year

ft msl elevation in feet above mean sea level

Figure 5-4

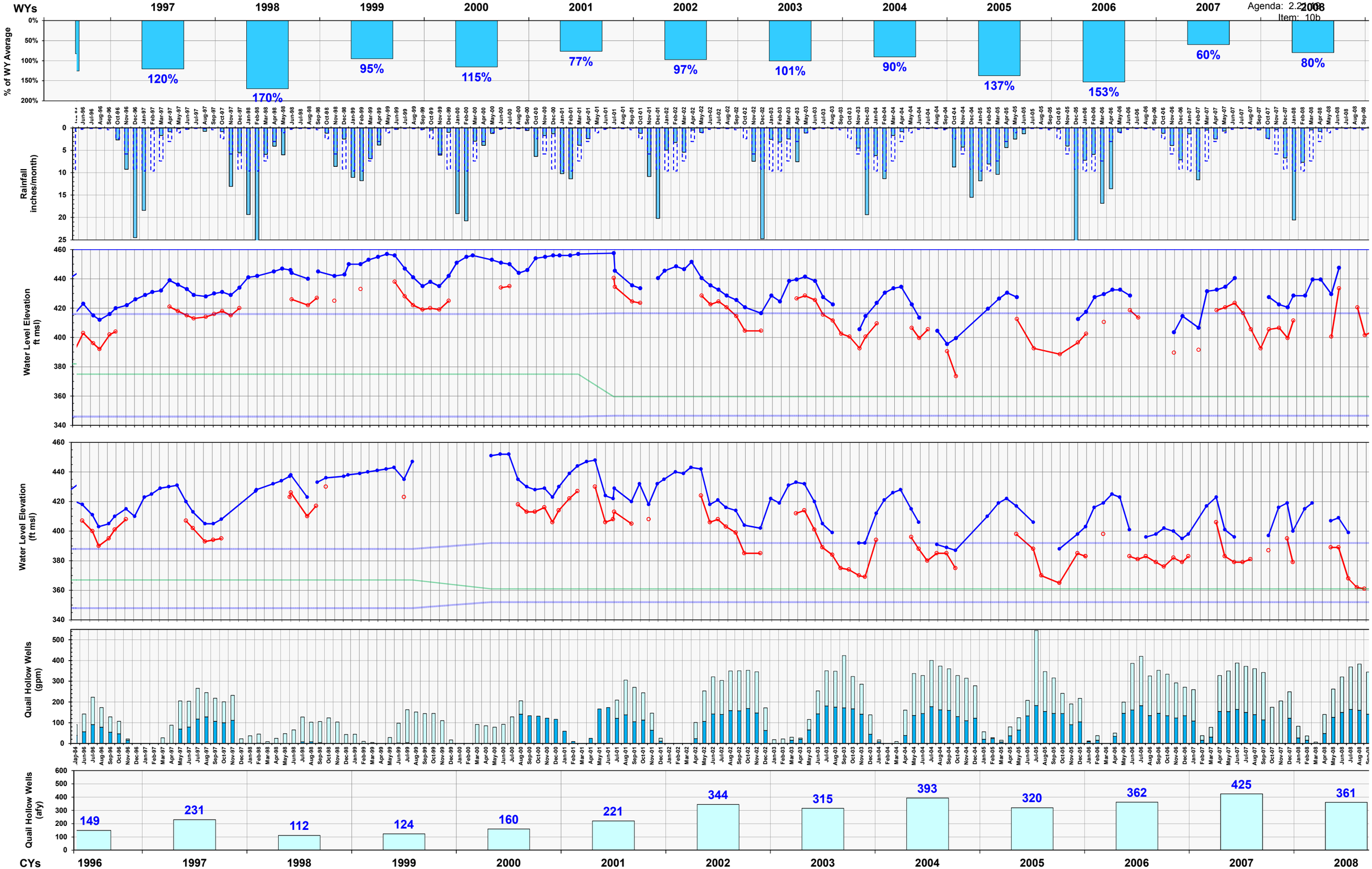
SLVWD Pasatiempo Wells Groundwater Levels and Annual Pumping and Precipitation, 1975-2018



afy acre-feet per year
ft msl elevation in feet above mean sea level
gpm gallons per minute

CY calendar year
WY water year (Oct-Sep)

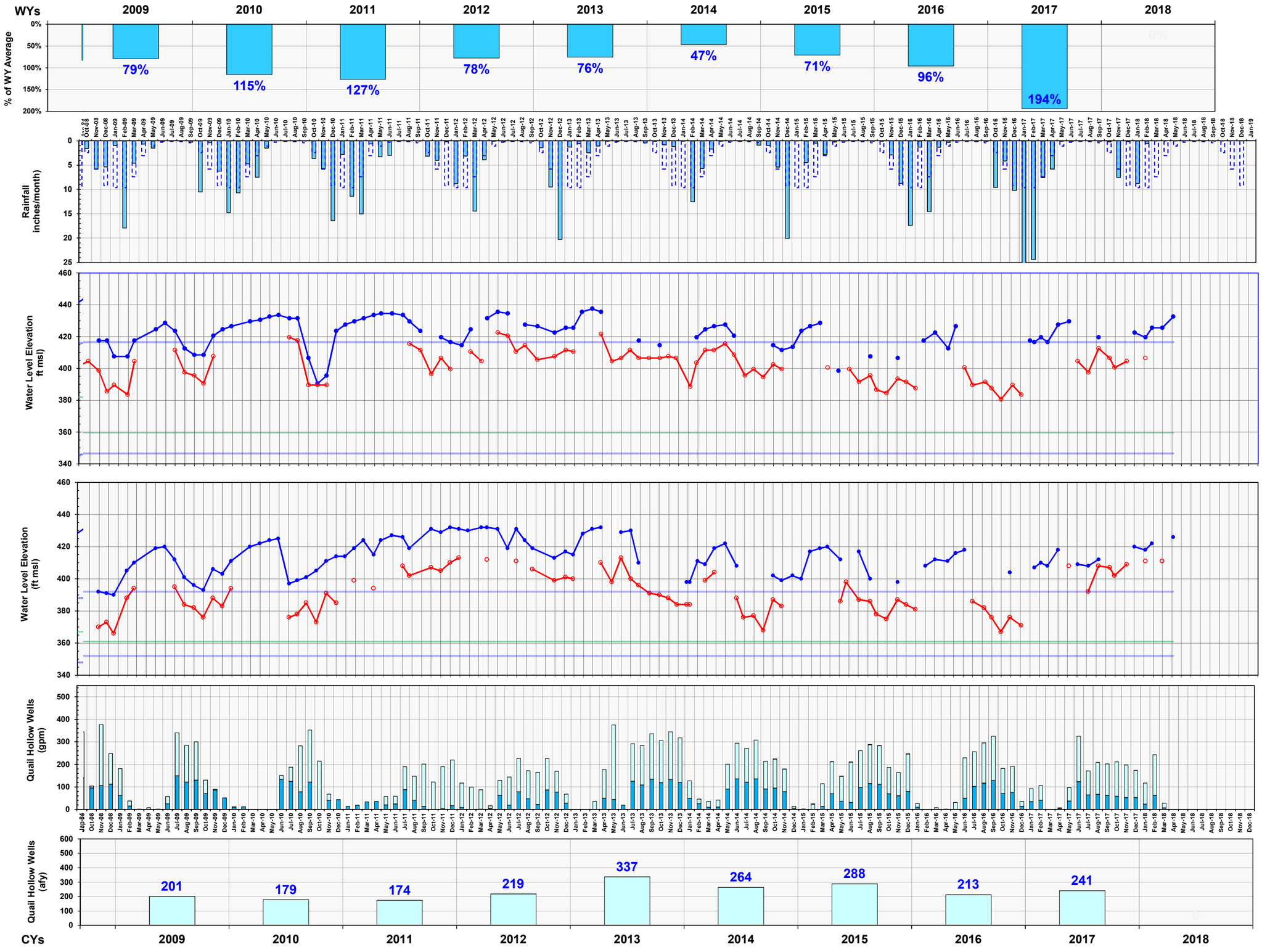
Figure 5-5
SLVWD Quail Hollow Wells Groundwater Levels and Monthly Pumping and Precipitation, CYs 1984-2018



AFY acre-feet per year
ft msl elevation in feet above mean sea level
gpm gallons per minute

CY calendar year
WY water year (Oct-Sep)

Figure 5-5
SLVWD Quail Hollow Wells Groundwater Levels and Monthly Pumping and Precipitation, CYs 1984-2018



AFY acre-feet per year
ft msl elevation in feet above mean sea level
gpm gallons per minute

CY calendar year
WY water year (Oct-Sep)

Figure 5-5
SLVWD Quail Hollow Wells Groundwater Levels and Monthly Pumping and Precipitation, CYs 1984-2018

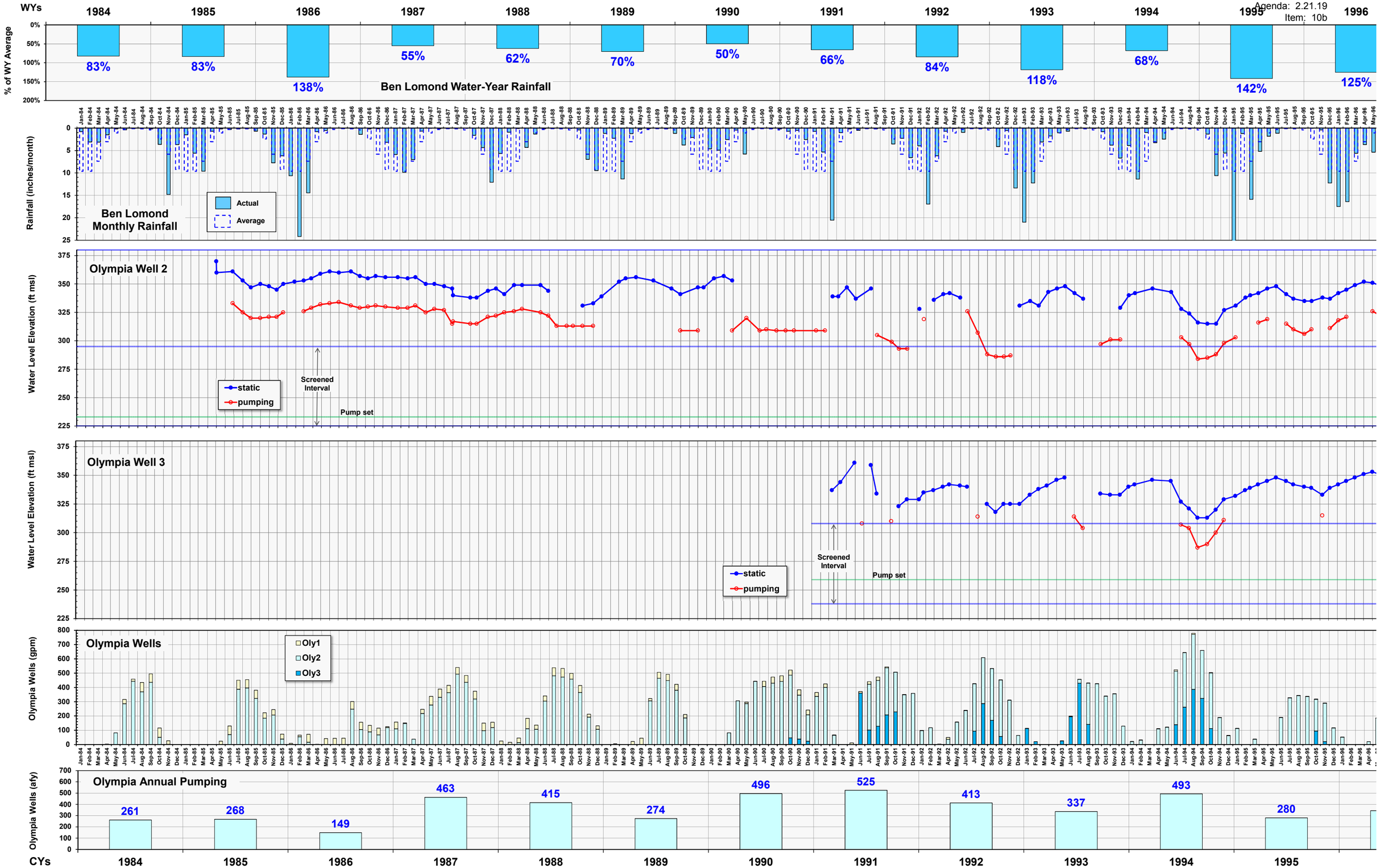


Figure 5-6
SLVWD Olympia Wells Groundwater Levels and Monthly Pumping and Precipitation, CYs 1984-2018

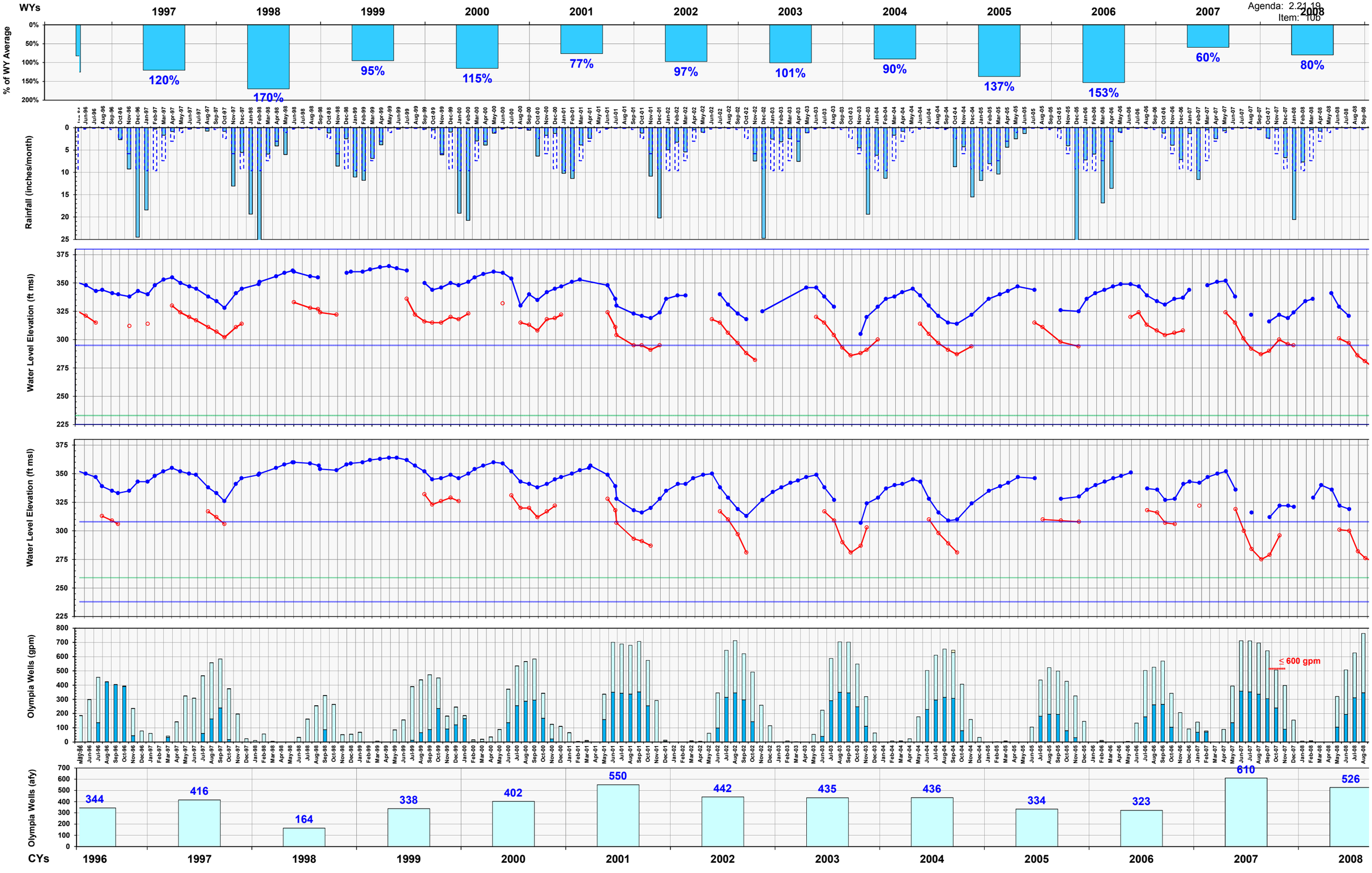


Figure 5-6
SLVWD Olympia Wells Groundwater Levels and Monthly Pumping and Precipitation, CYs 1984-2018

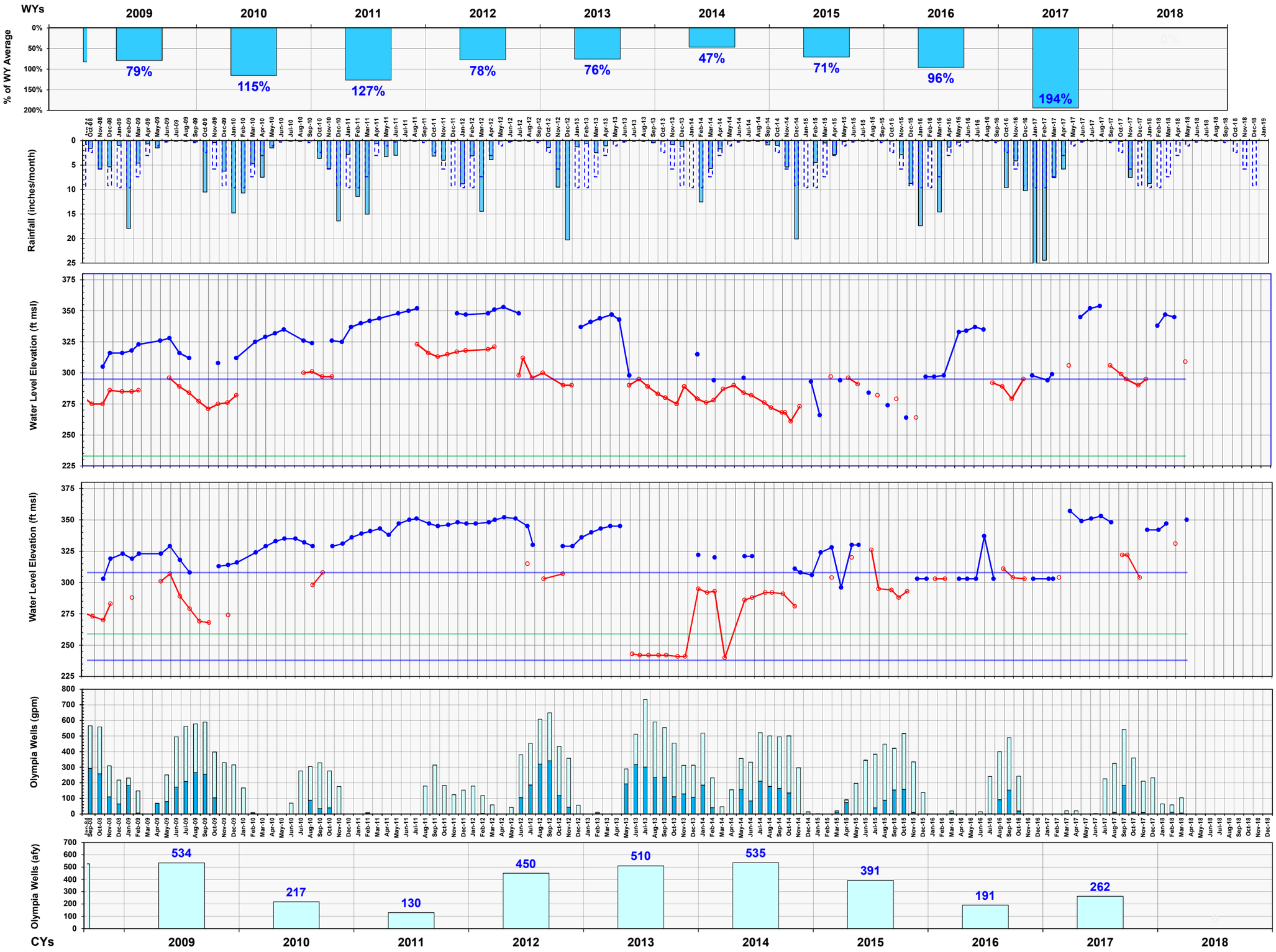
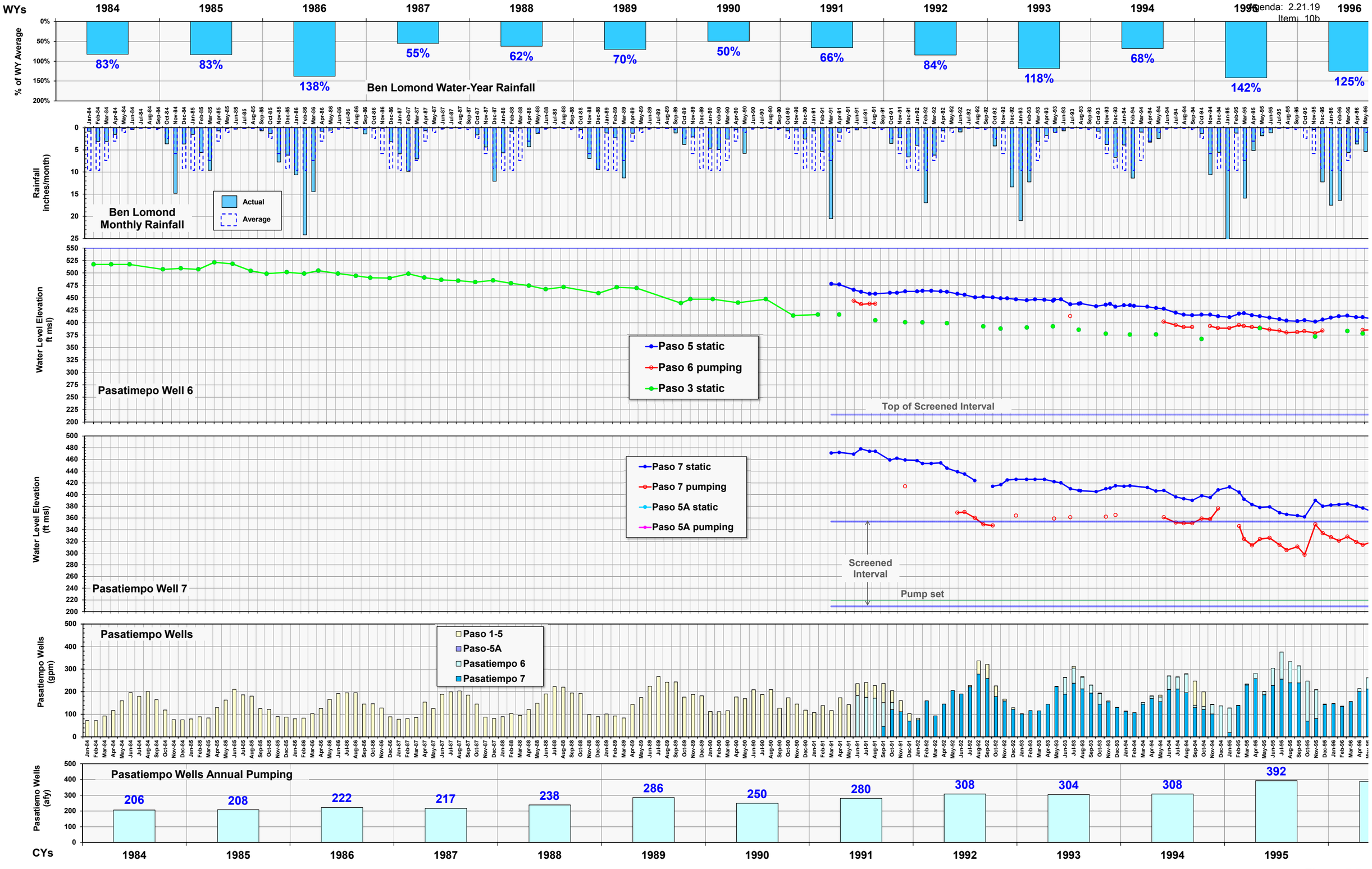


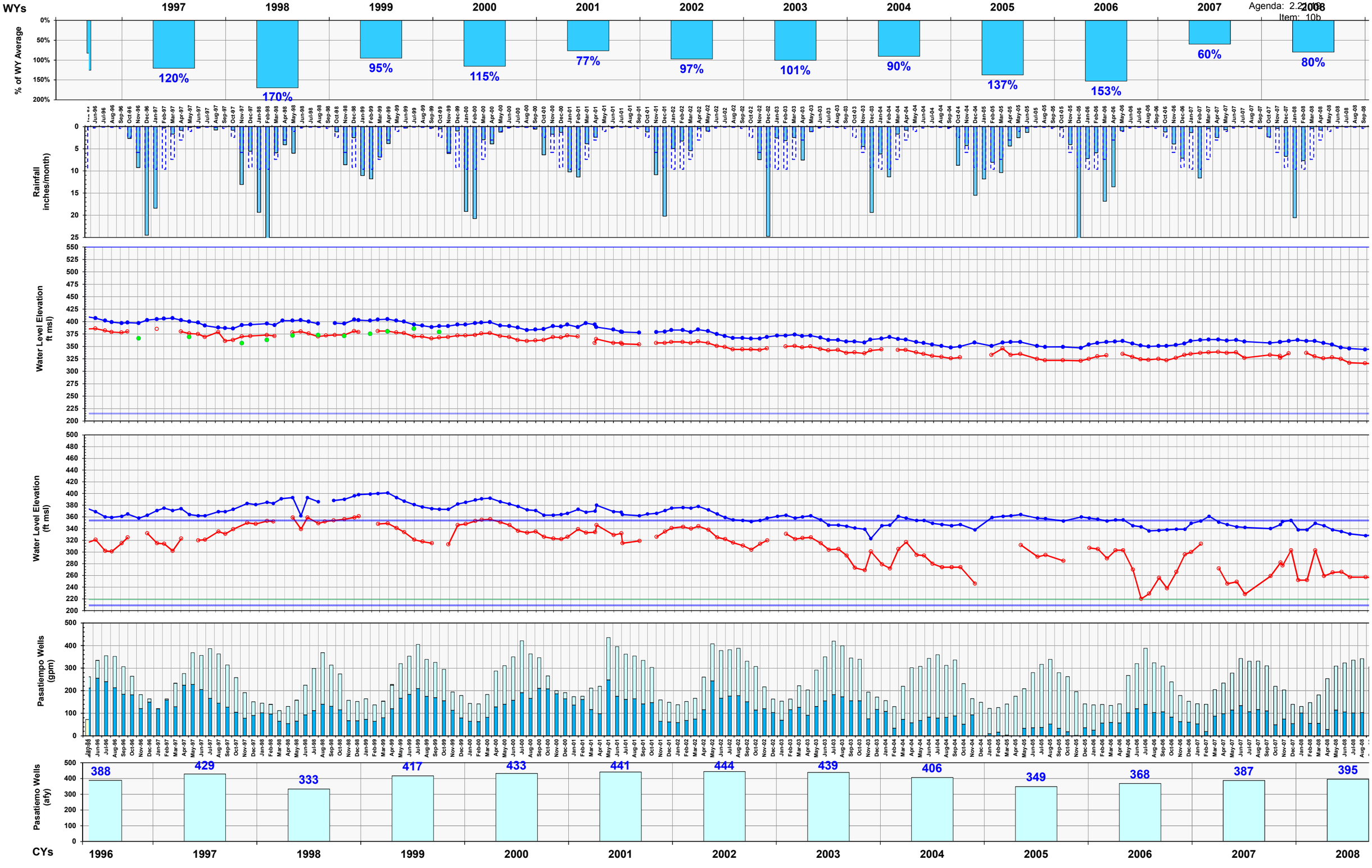
Figure 5-6
SLVWD Olympia Wells Groundwater Levels and Monthly Pumping and Precipitation, CYs 1984-2018



afy acre-feet per year
ft msl elevation in feet above mean sea level
gpm gallons per minute

CY calendar year
WY water year

Figure 5-7
SLVWD Pasatiempo Wells Groundwater Levels and Monthly Pumping and Precipitation, CYs 1984-2018



AFY acre-feet per year
ft msl elevation in feet above mean sea level
gpm gallons per minute

CY calendar year
WY water year

Figure 5-7
SLVWD Pasatiempo Wells Groundwater Levels and Monthly Pumping and Precipitation, CYs 1984-2018

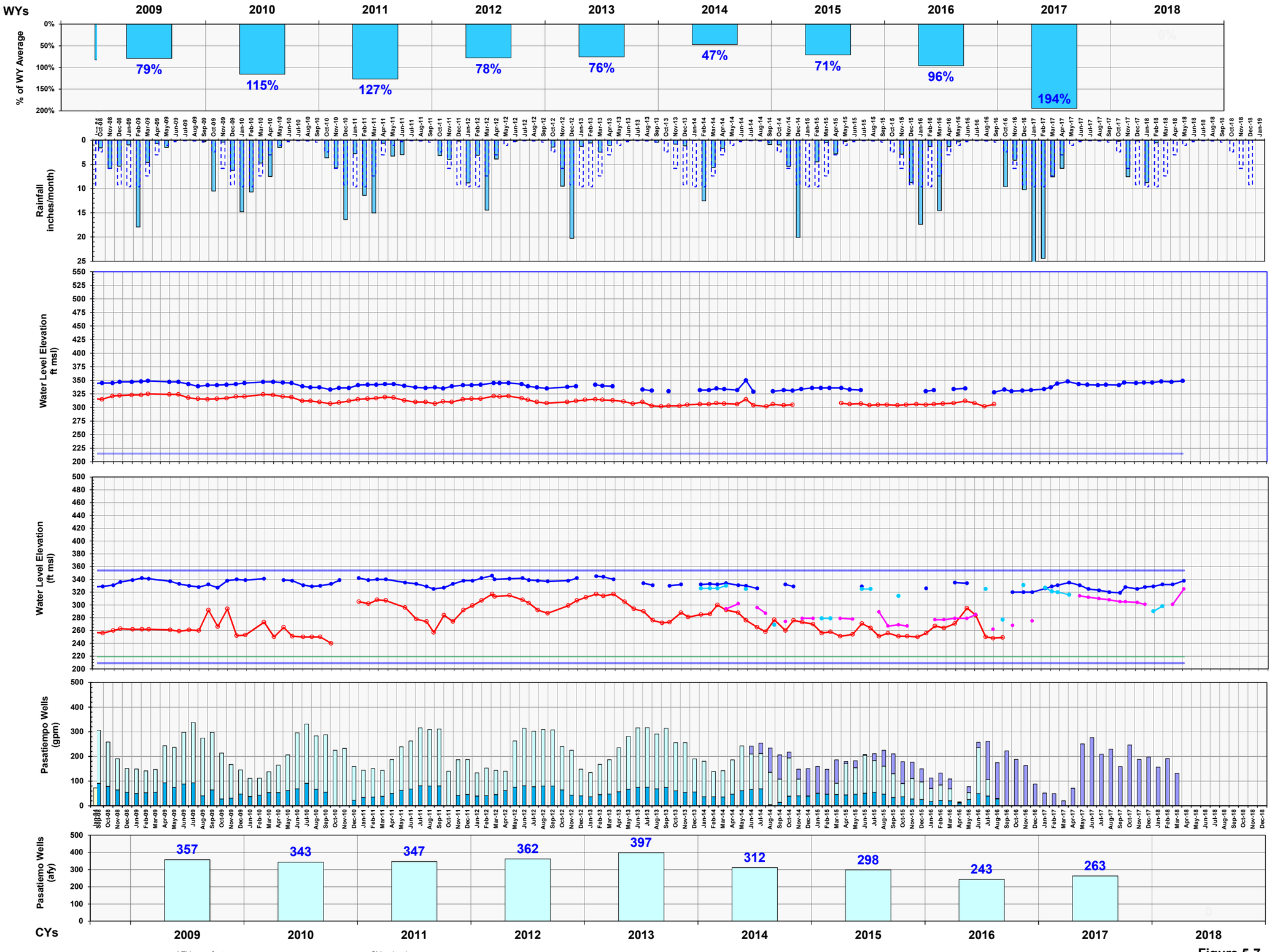


Figure 5-7
SLVWD Pasatiempo Wells Groundwater Levels and Monthly Pumping and Precipitation, CYs 1984-2018

6 Conjunctive Use Scenarios

On the basis of the analyses of water demand, production capacity, and available resources documented in Sections 2 through 5, this section presents simulations of SLVWD monthly water supply and water use for a base-case and alternative conjunctive use scenarios. Each simulation assumes a repeat of the WY 1970–2017 climactic cycle under assumed 2045 water demand.

The simulated base case and alternative conjunctive use scenarios are defined and grouped as follows:

- Base case – Calibrated to SLVWD's actual average, minimum, and maximum proportional use of surface water and groundwater sources during WYs 2000–2017; excludes the use of system interties.
- Scenario 1 – Optimizes the use of currently available sources using system interties and potential capacity enhancements assuming varying degrees of compliance with existing water rights; achieves Pasatiempo area in-lieu recharge by substituting excess North and Felton diversions for groundwater pumping.
- Scenario 2 – Scenario 1 plus use of SLVWD's allotment of water stored in Loch Lomond reservoir.
- Scenario 3 – Scenario 2 plus operation of an Olympia ASR project supplied by excess available stream diversions.
- Scenario 4 – Scenario 3 plus additional Scotts Valley in-lieu recharge by substituting excess available SLVWD surface water for SVWD groundwater pumping.

Scenarios 1, 2, and 3 include multiple alternatives. Table 6-1 summarizes the assumptions underlying 15 Scenario 1 alternatives, three alternatives each for Scenarios 2 and 3, and one alternative for Scenario 4.

6.1 Methods and Assumptions

Each conjunctive use alternative is simulated by calculating monthly water supply and use while assuming 2045 water demand and a repeat of the WY 1970–2017 climatic cycle. The evaluation of each alternative consists of the following steps:

1. A model of WY 1970–2017 monthly water demand is created from the annual and monthly distribution of system demands characterized in Table 2-2 and Figure 2-5. Each alternative is evaluated using this same demand model.
2. For each SLVWD diversion, a synthetic record of monthly unimpaired flows and potentially divertible flows is created from a set of the wet and dry monthly flow duration curves for a sequence of years classified by water-year types A through N (Table 4-6), given assumed diversion capacities, bypass rates, and water rights limitations.
3. Maximum groundwater pumping capacities are assumed for each of the three wellfields, with reduced capacities assumed for certain months during drought periods with heavy demand, as described in Section 5.1.
4. The monthly water supply and demand records created in the first three steps are used in a spreadsheet analysis that satisfies each system's monthly demand with available supplies according to assumed prioritization and limitations of use and then calculates the approximate percent of flow remaining downstream of each diversion.

Table 6-2 provides the water production and conveyance capacities assumed for each scenario. The assumed effective capacities were established through calibration of the base case and are generally somewhat lower than the highest monthly rates that occur during ideal but atypical circumstances (Table 3-2).

The left-hand columns of Table 6-3 list the water-year type assigned to each year of the 48-year WY 1970–2017 climatic cycle; letters A through N designate the driest to wettest years, respectively (Table 4-6).

For each system, the prioritization of use among available sources is from left to right across Table 6-2. To fulfill North service area monthly demand, each simulation uses available Foreman and Peavine diversions first, then draws on Clear and Sweetwater creeks, and finally groundwater pumping. Potential diversions from Fall Creek are used before diversions from Bull Creek. Potential stream diversions in excess of local monthly demand may be considered available for inter-system transfer or ASR.

Criteria for evaluating the results of the simulated alternatives include whether or not:

- The Felton system fulfills demand in compliance with water rights.
- The North system fulfills demand without potentially unsustainable groundwater pumping.
- In-lieu recharge is achieved in the South system and Scotts Valley areas.
- Stream baseflows increase with the potential to improve habitat.
- Potential surface water resources remain unused.

The percent of synthesized streamflow remaining downstream of SLVWD's simulated diversions is approximated as follows:

- The percent reduction in flow immediately downstream of each diversion is calculated as the simulated rate of diversion divided by the synthesized rate of unimpaired flow. Subtracting this fraction from 1 and multiplying by 100 gives the estimated percent of unimpaired flow remaining downstream of the diversion.
- Percent reductions in Boulder Creek and SLRBT flows are calculated as the simulated rate of upstream SLVWD diversions divided by the sum of the

synthesized impaired flow and the base-case rate of diversion. Subtracting this fraction from 1 and multiplying by 100 gives the estimated percent of flow remaining as a result of SLVWD diversions.

- As described in Section 5.2, the potential percent reduction in minimum monthly stream baseflow as a result of groundwater pumping is estimated separately as the average simulated pumping rate divided by the sum of the assumed rate of minimum impaired baseflow (Table 5-3) and the base-case pumping rate. Subtracting this fraction from 1 and multiplying by 100 percent gives the estimated percent of baseflow remaining as a result of SLVWD groundwater pumping.

Providing the simulation results in this manner is consistent with the highly approximate nature of the various flow estimates. These results reflect the effects of SLVWD stream diversions and groundwater pumping only, and are suitable for the intended planning-level evaluation of conjunctive use alternatives. Values of simulated monthly flow (e.g., expressed in units of afm, cfs, or gpm; tabulated in Appendix A) have limited precision and should not be used to evaluate compliance with specific regulatory, water-right, or habitat requirements.

In the following sections, water "imports" and "exports" refer to the transfer of water between SLVWD's three systems and between SLVWD and SVWD. The phrase "unused potential diversions" refers to potential diversions within permitted water rights and diversion capacities that exceed demand within the service area within which they are diverted, but which potentially could be transferred to another system or used for ASR.

6.2 Base Case

Exponent selected and adjusted the assumptions underlying the base case simulation of the WY 1970–2017 climactic cycle under 2045 water demand to represent SLVWD's recent and current production capacities and operational practices, with the exception of system interties. Because the use of system interties is only recent and relatively minor, their use is not included in the base case. Table 6-2 provides the assumed diversion, pumping, conveyance, and treatment capacities for the base case and other scenarios.

Table 6-3 presents an evaluation of how well the base case calibration reproduces SLVWD's actual average, minimum, and maximum proportional use of surface water and groundwater sources during WYs 2000–2017, a period representing "current and recent" conditions. On an average annual basis, the simulated base case matches the proportional contribution of each water source within 1 percent of total system production.

Figures 6-1, 6-2, and 6-3 illustrate a reasonably good fit between historical and simulated base-case hydrographs of monthly SLVWD water production, plotted both by system and by individual source. Figures 6-4 and 6-5 illustrate the results of the simulated base case on an annual and monthly basis, respectively.

Calibration of the base case requires assuming the Felton system diverts without fully complying with its permitted water rights, consistent with the system's reliance on its diversions as a sole water source (Table 4-4). Simulation of the base case results in non-compliant Felton diversions during all or portions of 23 percent of all 576 simulated months, of which 34 percent occur in October, 16 to 17 percent occur in September and November each, and 9 percent occur in May.

In the base case scenario, as well as in practice, groundwater pumping from the Olympia wells provides the final go-to source for the North system at times when the combined yields of other sources become insufficient. Pumping from the Quail Hollow wells is capped at an equivalent continuous rate of 500 gpm (~67 afm), which is assumed to decrease in up to three monthly steps to as little as 250 gpm during drought periods of heavy demand (Table 6-2; Section 5.1). Pumping from the Olympia wells is capped at an equivalent continuous rate of 780 gpm (~105 afm) based on historical maximum monthly production (Table 3-3) and is assumed to decrease in steps to as little as 475 gpm during drought periods of heavy demand. As a result of these imposed limits on pumping from groundwater storage, the base case simulates that North system total yield is insufficient to meet demand during 2.6 percent of all months, resulting in deficits of up to 30 afm during the months of July through October, and a water-year maximum deficit of 65 afy. The base case simulation assumes these deficits remain as unmet demand (Figure 6-5), whereas in practice additional groundwater would have been produced by

exceeding the limits imposed by the simulation, consistent with the slight downward trend in Olympia groundwater levels (Figure 5-3).

Table 6-4 includes the average annual results for the simulated base case and Table 6-5 presents a more detailed summary including simulated minimum and maximum annual rates. On average, the North system produces approximately 900 afy from stream diversions and 640 afy from wells. Simulated diversions range to more than 1,200 afy and maximum simulated groundwater pumping is greater than 1,000 afy. Unused potential diversions (i.e., diversions that are permitted and within diversion capacities but exceed North system monthly demand) average nearly 300 afy and range from 0 to more than 800 afy. Four afy of average annual North system demand remains unmet due to the imposed groundwater pumping limitations, as discussed in the preceding paragraph.

Felton diversions average 430 afy in the simulated base case, the system's sole water source. Unused potential diversions average about 400 afy and range between 300 and 600 afy, assuming non-compliance with permitted water rights. Unused potential diversions for the North and Felton systems combined average more than 700 afy and range between 300 and more than 1,300 afy. South system demand is fully met by pumping an average of 365 afy from the Pasatiempo wells, which have an assumed continuous pumping capacity of 450 gpm (Tables 6-2, 6-4, and 6-5).

The simulated base-case hydrographs provided in Figures 6-6 and 6-7 compare simulated rates of diversion to synthesized unimpaired flows and potentially divertible flows (i.e., within diversion capacities and water rights). In the case of Fall and Bennett creeks (Figure 6-7), unpermitted diversions are apparent during months when simulated diversions plot above potentially divertible flows.

Figures 6-8 and 6-9 are hydrographs of the percent of simulated monthly flow remaining downstream of North and Felton system diversions for the base case scenario, as defined in Section 6.1. This evaluation only considers the effects of SLVWD stream diversions. On average, 26 and 63 percent of the unimpaired monthly flows of Foreman and Peavine creeks are simulated to remain downstream of their respective diversions (Table 6-6), with monthly

minimums of 10 and 40 percent, respectively. These percentages are fairly constant for all of the evaluated conjunctive use alternatives because diversions in excess of North system demand mostly occur during high streamflow months when diversions compose only a small percentage of unimpaired flows. Base case simulated diversions represent an average of 14 percent of the flow of Boulder Creek, ranging monthly from 1 to 35 percent (i.e., an average of 86 percent of the flow remaining, ranging from 65 to 99 percent remaining).

On average, 83 and 64 percent of unimpaired flows remain downstream of the simulated Fall (including Bennett) and Bull creeks diversions, respectively, with a minimum of 32 percent remaining downstream of either diversion.

As defined in Section 6.1 and summarized in Table 6-6, the estimated percent of drought minimum baseflows remaining as a result of average base case groundwater pumping equals roughly 50 percent of potential Newell, Zayante, and Bean Creek baseflows. As calculated, average groundwater pumping by SLVWD, SVWD, and MHA accounts for 28 percent of SLRBT baseflow during drought minimum conditions. These values represent the effects of SLVWD groundwater pumping only, consistent with estimates derived from the historical record presented in Table 5-3.

Given the reasonably good match between the simulated base case and historical record (Table 6-3; Figures 6-1, 6-2, and 6-3), and the reasonable and well-documented underlying assumptions, the approach and method are suitable for evaluating qualitative differences between alternative conjunctive use scenarios.

6.3 Scenario 1: Optimize Use of Current Sources under Existing and Modified Conditions

As summarized in Table 6-1, the conjunctive use alternatives evaluated under Scenario 1 attempt to optimize currently available sources using system interties and potential capacity enhancements, assuming varying degrees of compliance with Felton water rights. Table 6-2 provides the assumed diversion, pumping, conveyance, and treatment capacities for each alternative.

The objectives of the Scenario 1 alternatives include: (a) reducing dry-season and drought Felton diversions in compliance with permitted water rights; (b) reduce the effect of groundwater pumping on stream baseflows during dry periods; (c) recover groundwater storage and sustainable groundwater production for the South system's Pasatiempo wells; and (d) produce groundwater sustainably from the Quail Hollow and Olympia wells.

The 15 conjunctive use alternatives evaluated under Scenario 1 are as follows (Table 6-1):

- Scenarios 1a and 1b evaluate full and partial compliance with the Felton system's permitted water rights.
- Scenarios 1c, 1d, and 1e evaluate the potential to increase stream diversions by increasing diversion capacities.
- Scenario 1f evaluates using the North-South system intertie to substitute North system unused potential stream diversions for South system groundwater pumping, thereby achieving "in-lieu recharge."
- Scenarios 1g1 through 1g4 evaluate transferring Felton system unused potential stream diversions to the South system as a substitute for groundwater pumping, thereby achieving in-lieu recharge.
- Scenarios 1h1 and 1h2 evaluate supplying the South system with unused potential stream diversions from both the North and Felton systems to reduce South system groundwater pumping.
- Scenario 1i evaluates reducing North system groundwater pumping by importing Felton system unused potential diversions.
- Scenarios 1j and 1k evaluate reducing North and South system groundwater pumping by importing unused potential diversions from the North and/or Felton systems.

6.3.1 Scenario 1a – Felton System Complies with Permitted Water Rights

Compared to the base case, Scenario 1a complies with Felton system permitted water rights by relying on water transfers using the existing system interties. As summarized in Tables 6-4 and 6-5, there are no unused North System potential diversions available during months when the Felton system requires a supplemental source to comply with water rights. Transfers of groundwater from the South system are not considered because of the nearly overdrawn conditions of the Pasatiempo area aquifer. In this case, Felton system diversions are simulated to average about 380 afy and demand remains unfulfilled by an average of 50 afy, ranging up to nearly 200 afy. Figure 6-5 illustrates the monthly distribution of unmet Felton demand for Scenario 1a during WYs 1970–2017. Additionally, average Felton unused potential diversions decrease by about 100 afy compared to the base case.

The simulated Scenario 1a hydrograph for the Felton system provided in Figure 6-10 shows that the simulated rates of diversion do not exceed the synthesized potentially divertible flows in compliance with water rights.

Figure 6-11 compares hydrographs of the percent of simulated monthly flow remaining downstream of the Felton system diversions (as defined in Section 6.1) for the base case and Scenario 1a. On average, 86 and 82 percent of simulated unimpaired monthly flows remain downstream of the Fall (including Bennett) and Bull creek diversions, respectively, with a minimum of about 40 to more than 50 percent of remaining downstream of either diversion (Table 6-6). As simulated, increases in minimum monthly flows are relatively minor for Fall Creek and more significant for Bull Creek compared to the base case.

6.3.2 Scenario 1b – Felton System Complies with Required Bypass Only

Scenario 1b assumes that the Felton system complies only with the flow bypass requirements of its permitted water rights, and not the SLRBT low-flow triggers that at times prevent all Felton diversions (Table 4-3). In this case, simulated Felton diversions average nearly 400 afy, about 5 percent higher than Scenario 1a, and are non-compliant during all or portions of 21 percent of all months (compared to 23 percent in the base case). Additionally, demand remains unfulfilled

by an average of 35 afy, ranging up to 85 afy, due to the lack of a supplemental source of water during deficit months. On average, 86 and 64 percent of simulated unimpaired monthly flows are calculated to remain downstream of the Fall (including Bennett) and Bull creek diversions, respectively, with a minimum of about 30 to 50 percent remaining downstream of either diversion (Table 6-6).

6.3.3 Scenarios 1c, 1d, and 1e – All Diversion Capacities Doubled

For Scenarios 1c, 1d, and 1e, the capacities of the North and Felton systems to divert, convey, and treat surface water are effectively doubled (Table 6-2). These scenarios evaluate the upper bounds of potential surface water production.

Scenarios 1c, 1d, and 1e are otherwise equivalent to Scenario 1a, the base case, and Scenario 1b, respectively, in terms of Felton water-rights compliance (Table 6-1). Like the base case, Felton system diversions occur without regard to permitted water rights in Scenario 1d, whereas Scenario 1c fully complies, and Scenario 1e complies only with required bypass flows.

For these scenarios, North system unused potential diversions approximately double to 600 afy, on average, and range up to 1,900 afy. Average Felton system unused potential diversions more than double, increasing from nearly 800 afy to more than 1,000 afy for these scenarios, compared to 300 to 420 afy for the base case and Scenarios 1a and 1b (Tables 6-4 and 6-5).

Because demand remains unchanged and no in-lieu recharge is attempted in Scenarios 1c, 1d, and 1e, the calculated percent of monthly flow remaining downstream of the North and Felton system diversions does not substantially differ from Scenario 1a, the base case, and Scenario 1b, respectively. However, reduced North system groundwater pumping as a result of increased diversion capacities results in a roughly 5 percent increase in the drought minimum baseflows remaining in lower Newell and Zayante creeks (Table 6-6).

The potential magnitude of diversions estimated in Scenarios 1c, 1d, and 1e is highly approximate and should not be used in quantitative estimates of potentially available water supplies. Rather, the conceptual gains in potential water production indicated by these scenarios

are intended to help guide decisions regarding potential infrastructure modifications. The actual yield of modified infrastructure will depend on numerous factors beyond the scope of this analysis. Given the uncertainty associated with the likely performance of modified infrastructure, the alternative conjunctive use scenarios presented and discussed in the remainder of this report assume the base case water production capacities for which the simulation procedure is calibrated. This allows other factors, such as system intertie use for in-lieu recharge, use of Loch Lomond, and ASR, to be evaluated on an apples-to-apples basis compared to the base case.

6.3.4 Scenario 1f – South System Imports North System Unused Potential Diversions

Scenario 1f is similar to Scenario 1a (i.e., base case but with Felton system complying with permitted water rights) with the exception that North system unused potential diversions are exported to the South system as a substitute for pumping the Pasatiempo wells (i.e., in-lieu recharge; Table 6-1). In this case, the South system imports an average and maximum of 115 afy and greater than 300 afy, respectively, as needed to fulfill demand during months when potential diversions exceed North system demand (Tables 6-4, 6-5, and 6-7). This results in an overall 32 percent reduction in South system groundwater pumping (Table 6-7). However, the conveyance capacity required for the maximum simulated monthly import, 337 gpm (on a continuous basis), slightly exceeds the North-South system intertie design capacity of 300 gpm (Tables 3-3, 6-2, and 6-7).

Figure 6-12 compares hydrographs of the percent of simulated monthly flow remaining downstream of the Felton system diversions (as defined in Section 6.1) for the base case and Scenario 1f. The percent of simulated monthly flow remaining downstream of North system diversions in Scenario 1f is only slightly less (≤1 percent) than the base case and Scenarios 1a and 1b. This is because diversions in excess of North system demand mostly occur during high streamflow months when diversions compose only a small percentage of unimpaired flows.

Reduced South system groundwater pumping as a result of importing North system unused potential diversions results in a slight increase (≤4 percent) in the drought minimum baseflows estimated to remain in lower Zayante and Bean creeks compared to the base case (Table 6-6).

The simulated export of unused potential stream diversions to the South system reduces North system average annual unused diversions to approximately 175 afy, compared to 290 afy for the base case (Table 6-4).

6.3.5 Scenarios 1g1 through 1g4 – South System Imports Felton System Unused Potential Diversions

Scenarios 1g1, 1g2, and 1g3 are equivalent to the base case and Scenarios 1a and 1b, respectively, except that Felton system unused potential diversions are exported to the South system as a substitute for pumping the Pasatiempo wells (i.e., in-lieu recharge; Table 6-1). In these cases, the South system imports an average of 200 to 280 afy, depending on water-rights compliance, and a maximum of nearly 320 afy, as needed to fulfill demand during months when potential diversions exceed Felton system demand (Tables 6-4, 6-5, and 6-7). This results in an overall reduction in South system groundwater pumping of 54 to 77 percent (Table 6-7). However, the conveyance capacity required for the maximum monthly simulated import, 290 gpm (continuous), exceeds the existing Felton-South (via North) system intertie capacity of 150 gpm (Tables 3-3, 6-2, and 6-7). A more direct intertie between the Felton and South systems would likely have greater capacity than the existing intertie via the North system.

Figure 6-13 compares hydrographs of the percent of simulated monthly flow remaining downstream of the Felton system diversions for Scenarios 1a and 1g2. In the case of Scenario 1g2, the percent of unimpaired monthly flows estimated to remain downstream of the Felton system diversions averages 82 and 64 percent for the Fall (including Bennett) and Bull creek diversions, respectively, with minimums of about 25 to 40 percent (Table 6-6). Figure 6-13 shows that increased diversions for in-lieu recharge occur during wet periods and do not lower minimum monthly flows downstream of the diversions. Reduced South system groundwater pumping as a result of importing Felton system unused potential diversions results in a 6 percent

increase in the drought minimum baseflows estimated to remain in lower Zayante and Bean creeks compared to the base case (Table 6-6).

Scenario 1g4 is identical to Scenario 1g2 (i.e., Felton system complies with permitted water rights) except that the simulated Felton-South intertie capacity is limited to 150 gpm (Tables 6-1 and 6-2). In this case, the South system imports an average and maximum of 165 and 225 afy, respectively, as needed to fulfill demand during months when potential diversions exceed Felton demand (Tables 6-4, 6-5, and 6-7). This results in an overall 45 percent reduction in South system groundwater pumping (Table 6-7). The percent of unimpaired monthly flows remaining downstream of the diversions averages 82 and 68 percent for the Fall (including Bennett) and Bull creek diversions, respectively, with minimums of about 35 to 40 percent (Table 6-6). Reduced South system groundwater pumping results in an estimated 5 percent increase in drought minimum baseflows remaining in lower Zayante and Bean creeks compared to the base case (Table 6-6). The Felton system's remaining average annual unused potential diversions decrease to approximately 140 afy compared to about 300 afy for Scenario 1a (Table 6-4).

6.3.6 Scenario 1h1 and 1h2 – South System Imports North and Felton System Unused Potential Diversions

Scenario 1h1 and 1h2 assume that the South system imports both North and Felton system unused potential diversions (Table 6-1). Scenario 1h1 assumes that Felton diversions are unrestricted, whereas Scenario 1h2 assumes the Felton system complies with permitted water rights. Figure 6-5 includes a plot of the monthly results for Scenario 1h2.

In these cases, the South system imports an average of 115 afy from the North system, similar to Scenario 1f, and an average of 90 to 290 afy from the Felton system, depending on water-rights compliance, as needed to fulfill remaining demand (Tables 6-4, 6-5, and 6-7). This results in an overall reduction in South system groundwater pumping of 56 to 79 percent (Table 6-7), and as much as a 7 percent increase in lower Zayante and Bean Creek drought minimum baseflows (Table 6-6). However, the conveyance capacity required for the maximum monthly simulated import from the Felton system, about 290 gpm (on a continuous basis), exceeds the Felton-South (via North) system existing intertie capacity of 150 gpm (Tables 3-3, 6-2, and 6-7).

For Scenario 1h2, the percent of unimpaired monthly flows remaining downstream averages 72 and 63 percent for the Fall (including Bennett) and Bull creek diversions, respectively, with minimums of about 30 to 40 percent (Table 6-6). Reduced South system groundwater pumping results in an estimated 6 to 7 percent increase in drought minimum baseflows remaining in lower Zayante and Bean creeks compared to the base case (Table 6-6).

Similar to Scenario 1f, North system average annual remaining unused diversions decrease to approximately 175 afy, compared to 290 afy for the base case (Table 6-4). The Felton system's remaining average annual unused potential diversions decrease to approximately 100 to 135 afy, compared to about 300 afy for Scenario 1a. The average annual export of Felton diversions to the South system in Scenario 1h2 (90 afy) is less than half that of Scenario 1g2 (200 afy), which results from supplying the South system first with unused North system diversions. Among all of the evaluated Scenario 1 alternatives, Scenario 1h2 achieves the greatest use of North and Felton system potential diversions, resulting in 275 afy of potential diversions remaining unused, on average, compared to about 600 afy for Scenario 1a.

6.3.7 Scenario 1i – North System Imports Felton System Unused Potential Diversions

Scenario 1i assumes that the North system imports unused potential diversions from the Felton system, in compliance with water rights, to reduce North system groundwater pumping (Table 6-1). In this case, the North system imports an average and maximum of 130 afy and 265 afy, respectively, as needed to fulfill demand during months when North system diversions are insufficient and Felton potential diversions exceed Felton demand (Table 6-7). This results in an overall reduction in North system groundwater pumping of 20 percent. However, the conveyance capacity required for the maximum monthly simulated import from the Felton system, about 355 gpm, exceeds the Felton-North system intertie capacity of 150 gpm (Tables 3-3, 6-2, and 6-7). As such, total imports limited by the existing intertie capacity would be somewhat less, as is demonstrated by comparing the results for Scenarios 1j and 1k in Section 6.3.8. The Felton system's remaining average annual unused potential diversions decrease to approximately 180 afy, compared to about 300 afy for Scenario 1a.

6.3.8 Scenarios 1j and 1k – North System Imports Felton System Unused Potential Diversions and South System Imports Remaining Unused Potential Diversions

Scenarios 1j and 1k assume that the North system imports Felton system unused potential diversions to reduce North system groundwater pumping, while the South system imports any remaining unused potential diversions from the North and Felton systems to reduce South system groundwater pumping (Table 6-1). Scenario 1j assumes unlimited intertie capacities whereas Scenario 1k assumes the design intertie capacities (Tables 3-3 and 6-7). Figure 6-5 includes a plot of the monthly results for Scenario 1j.

North system exports to the South system average approximately 115 afy in both cases (similar to Scenarios 1f, 1h1, and 1h2), whereas Felton system exports to the North and South systems average 144 afy and 133 afy for Scenarios 1j and 1k, respectively. The remaining unused potential diversions average between 330 and 350 afy, compared to 600 afy for Scenario 1a (Table 6-4).

The average percentages of unimpaired monthly flows remaining downstream of the North and Felton system diversions are within the range of the other evaluated alternatives (Table 6-6). Simulated reductions in North and South system groundwater pumping are 20 percent and 36 percent, respectively, for Scenario 1j, and 17 and 39 percent for Scenario 1k (Table 6-7). Reduced North and South system groundwater pumping results in an estimated 6 to 10 percent increase in drought minimum baseflows remaining in lower Newell, Zayante, and Bean creeks compared to the base case (Table 6-6).

6.4 Scenario 2: Import from Loch Lomond

Scenario 2 evaluates SLVWD's use of its Loch Lomond reservoir annual allotment of 313 afy. The three conjunctive use alternatives evaluated under Scenario 2 are (Table 6-1):

- Scenario 2a – North and Felton systems import from Loch Lomond to satisfy demand that remained unmet in Scenario 1a.

- Scenario 2b – Scenario 2a plus the South system imports water from Loch Lomond for in-lieu recharge.
- Scenario 2c – Scenario 2b plus the South system also imports unused potential diversions from the North system, and the North system imports unused potential diversions from the Felton system.

6.4.1 Scenario 2a – North and Felton Systems Use Loch Lomond to Fulfill Unmet Demand

As simulated for Scenario 2a, the North system imports an average and maximum of 4 and 65 afy (Tables 6-8 and 6-9), respectively, from Loch Lomond to fulfill demand unfulfilled in the base case because of limits imposed on groundwater pumping (Section 6.2). Additionally, the Felton system imports an average and maximum of 50 and 185 afy, respectively, from Loch Lomond to comply with its permitted water rights. Loch Lomond is the only supplemental source considered in this analysis that allows the Felton system to comply with its permitted water rights.

The maximum monthly rates of import would require conveyance capacities in excess of 200 and 300 gpm (continuous) for the North and South systems, respectively (Table 6-10). These imports only use about 16 percent of SLVWD's annual 313 afy Loch Lomond allotment, on average, but use up to 60 percent of the allotment some years (Table 6-10).

6.4.2 Scenario 2b – South System Imports from Loch Lomond for In-Lieu Recharge

In addition to the use of Loch Lomond as simulated in Scenario 2a, Scenario 2b assumes that the South system imports an average of 245 afy from Loch Lomond, ranging between 120 and 290 afy, as a substitute for pumping the Pasatiempo wells. In this case, SLVWD uses nearly 95 percent of its Loch Lomond annual allotment on average, ranging from 87 to 100 percent per year. The maximum monthly import requires a conveyance capacity of nearly 200 gpm (continuous) (Table 6-10).

The South system's use of Loch Lomond results in an overall 67 percent reduction in groundwater pumping (Table 6-10), which results in an estimated 7 to 8 percent increase in drought minimum baseflows remaining in lower Zayante and Bean creeks compared to the base case (Table 6-11).

6.4.3 Scenario 2c –South System Imports from Loch Lomond and North and South Systems Import Unused Potential Diversions

In addition to the use of Loch Lomond as simulated in Scenario 2b, Scenario 2c assumes that the North and South systems import unused potential diversions. Figure 6-14 includes a plot of the monthly results for Scenario 2c. In this case, the South system imports an average of 20 afy from the North system and the North system imports an average of 130 afy from the Felton system in response to seasonal differences in each system's supply and demand. Combined with South system imports from Loch Lomond, this results in an overall 21 percent reduction in North system groundwater pumping and 73 percent reduction in South system groundwater pumping (Table 6-10). Reduced North and South system groundwater pumping results in an estimated 5 to 11 percent increase in drought minimum baseflows remaining in lower Newell, Zayante, and Bean creeks compared to the base case (Table 6-11). The percentages of monthly flow remaining downstream of the North and Felton system diversions are within the respective ranges estimated for the other conjunctive use alternatives. The remaining unused North and Felton system potential diversions average nearly 450 afy, compared to 600 afy for Scenario 1a (Tables 6-4 and 6-8).

6.5 Scenario 3: Operate Olympia Area ASR Project

Scenario 3 evaluates the operation of a North system ASR project in addition to SLVWD's use of its Loch Lomond allotment. The three conjunctive use alternatives evaluated under Scenario 3 are (Table 6-1):

- Scenario 3a – ASR project uses North system unused potential diversions.
- Scenario 3b – ASR project uses Felton system unused potential diversions.

- Scenario 3c – ASR project uses North and Felton system unused potential diversions.

These alternatives assume an injection capacity of 400 gpm from December through May, extraction capacities ranging from 250 to 585 gpm from June through November (Table 6-2), and a 100 percent extraction efficiency. In each case, the percentages of monthly flow estimated to remain downstream of the North and Felton system diversions are within the ranges estimated for the other conjunctive use alternatives.

6.5.1 Scenario 3a – North System Operates ASR Project Using North System Unused Potential Diversions

In addition to the use of Loch Lomond as in Scenario 2b, Scenario 3a assumes storing unused North system potential diversions by operating an ASR project, and withdrawing this water to help meet North system demand during dry periods. In this case, an average of approximately 190 afy is injected and extracted, effectively reducing North system groundwater production by 30 percent, and increasing drought minimum baseflows in lower Newell, Zayante, and Bean creeks by 11 to 15 percent compared to the base case (Tables 6-10 and 6-11). The remaining unused North system potential diversions average 100 afy, compared to 290 afy for the base case (Tables 6-4 and 6-8).

6.5.2 Scenario 3b – North System Operates ASR Project Using Felton System Unused Potential Diversions

Scenario 3b assumes storing unused Felton system potential diversions by operating an ASR project and withdrawing this water to help meet North system demand during dry periods. In this case, an average of approximately 220 afy is injected and extracted, effectively reducing North system groundwater production by 34 percent, and increasing drought minimum baseflows in lower Newell, Zayante, and Bean creeks by 11 to 17 percent compared to the base case (Tables 6-10 and 6-11). The remaining unused Felton system potential diversions average 85 afy, compared to 300 afy for Scenario 1a (Tables 6-4 and 6-8).

6.5.3 Scenario 3c – North System Operates ASR Project Using North and Felton System Unused Potential Diversions

Scenario 3c assumes storing unused North and Felton system potential diversions by operating an ASR project and withdrawing this water to help meet North system demand during dry periods. Figure 6-14 includes a plot of the monthly results for Scenario 3c. In this case, an average of approximately 410 afy is injected and extracted, effectively reducing North system groundwater production by 64 percent and increasing drought minimum baseflows in lower Newell, Zayante, and Bean creeks by 14 to 33 percent compared to the base case (Tables 6-10 and 6-11). The remaining unused North and Felton system potential diversions average 185 afy, compared to 600 afy for Scenario 1a (Tables 6-4 and 6-8). Figures 6-15 and 6-16 provide hydrographs of the percentages of simulated monthly unimpaired flow remaining downstream of the North and Felton system diversions compared to the base case and Scenario 1a. Figures 6-15 and 6-16 show that increased diversions for in-lieu recharge occur during wet periods do not lower minimum monthly flows remaining downstream of the diversions.

6.6 Scenario 4: Further Contribute to Scotts Valley Area In-Lieu Recharge

Scenario 4 is the same as Scenario 3c except that North and Felton system unused potential diversions are provided to SVWD as a substitute for SVWD groundwater pumping in the Scotts Valley area (Table 6-1). Assuming the design 350 gpm (continuous) capacity of the SLVWD-SVWD intertie, an average of approximately 165 afy of unused potential diversions are provided to SVWD, ranging from 20 to 500 afy (Tables 6-8 and 6-9). Reduced SVWD pumping may help increase Bean Creek baseflows but is not estimated as part of this analysis. The remaining unused North and Felton system unused potential diversions average 17 afy, with a maximum of 200 afy.

No.	Base Case and Alternative Conjunctive Use Scenarios	Stream Diversion Capacities		Felton System Water Rights			Stream Diversion Exports Using System Interties						Import from Loch Lomond			Scotts Valley In-Lieu Recharge with Exported Diversions	
							North System to			Felton System to							
		Exist-ing	Doubled	Comply	Not Comply	Comply with Bypass Only	Felton Sys-tem	South Sys-tem	Olym-pia ASR	South Sys-tem	North Sys-tem	Olym-pia ASR	to North Sys-tem	to Felton Sys-tem	to South Sys-tem	from North System	from Felton System
	Historical Record, WYs 2000-2017 (from Table 3-3)	●			●		*	*									
	Synthesized Records, WYs 1970-2017:																
1	**Base case Simulated** historical record (calibrated to WYs 2000-2017)[a]	●			●												
	Scenario 1 Alternatives Using Existing and Modified Infrastructure and Water Rights Variations																
2	**1a.** Felton system complies with water rights.	●		○													
3	**1b.** Felton system complies with required bypass flows, but not SLRBT low-flow no-diversion requirements.	●				○											
4	**1c.** All diversion capacities doubled; Felton system complies with water rights.		●	○													
5	**1d.** All diversion capacities doubled; Felton system diverts without regard to water rights.		●		●												
6	**1e.** All diversion capacities doubled; Felton system complies with required bypass flows only.		●			○											
7	**1f.** South system imports North system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	●		○			×	●									
8	**1g1.** South system imports Felton system unused potential diversions for in-lieu recharge; Felton system diverts without regard to water rights.	●			●		×			●							
9	**1g2.** Scenario 1g1 except Felton system complies with water rights.	●		○			×			●							
10	**1g3.** Scenario 1g1 except Felton system complies with required bypass flows only.	●				○	×			●							
11	**1g4.** Scenario 1g2 except intertie capacities limited.	●		○			×			▲							
12	**1h1.** South system imports unused potential diversion from North and Felton systems for in-lieu recharge; Felton system diverts without regard to water rights.	●			●		×	●		●							
13	**1h2.** Scenario 1h1 except Felton system comples with water rights.	●		○			×	●		●							
14	**1i.** North system imports Felton system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	●		○			×				●						
15	**1j.** Scenario 1i plus South system imports unused potential diversion from North and Felton systems.	●		○			×	●		●	●						
16	**1k.** Scenario 1j except intertie capacities limited.	●		○			×	●		▲	▲						
	Scenario 2 – Import from Loch Lomond																
17	**2a.** North and Felton systems import from Loch Lomond to satisfy unmet demand in Scenario 1a.	●		●			×						●	●			
18	**2b.** Scenario 2a plus South system imports from Loch Lomond for in-lieu recharge.	●		●			×						●	●	●		
19	**2c.** Scenario 2b plus South system also imports North system unused diversions, and North system imports unused Felton system diversions.	●		●			×	●			●		●	●	●		
	Scenario 3 – Import from Loch Lomond and Operate Olympia Aquifer Storage and Recovery (ASR)																
20	**3a.** Scenario 2b plus North system operates Olympia area ASR using North system unused diversions.	●		●			×		⊙					●	●		
21	**3b.** Scenario 2b plus North system operates Olympia area ASR using Felton system unused diversions.	●		●			×					●		●	●		
22	**3c.** Scenarios 3a and 3b combined.	●		●			×		⊙			●		●	●		
	Scenario 4 – Contribute to Scotts Valley In-Lieu Recharge while Operating Olympia ASR and Importing from Loch Lomond																
23	**4.** Scenario 3c plus SVWD imports North and Felton system remaining unused potential diversions.	●		●			×		⊙			●		●	●	●	●

● Base case condition or scenario assumption.
* Minor use since 2016.
○ Water rights compliance results in unmet demand some years.
× North system has no unused diversions when needed by Felton.
▲ Intertie capacities limited to rated values (Table 3-3).
⊙ Diversions exported to Olympia ASR imported back to North system.

All scenarios assume estimated 2045 demand and repeat of WY1970-2017 climatic cycle.
See Table 6-2 for assumed diversion, conveyance, and treatment capacities.
[a] Simulated base case does not reflect minor use of system interties in actual use since 2016.

Table 6-1
Summary of Conjunctive Use Scenario Alternative Assumptions

Base Case and Alternative Conjunctive Use Scenarios	North System[a]						Felton System[a]		South System	Interties					ASR of Unused Diversions[c]	
	Stream Diversions				Wells		Diversions								Source:	
	Foreman Creek	Peavine Creek	Clear & Sweetwater Cks	Conveyance to WTP	Quail Hollow[b]	Olympia[b]	Fall & Bennett Cks	Bull Creek	Pasatiempo Wells	North-South	Felton-South	Felton-North	SLVWD-SVWD	Loch Lomond	North System	Felton System
	gallons per minute (gpm; continuous)															
Historical Record, WYs 2000-2017 (from Table 3-3)	926		560	1,030	545	780	460		435	300	150	150	350	-	-	-
Base case Simulated historical record (calibrated to WYs 2000-2017)	800	200	515	800	500 *250*	780 *475*	440	166	450	-	-	-	-	-	-	-
Scenario 1 Alternatives Using Existing and Modified Infrastructure and Water Rights Variations																
1a. Felton system complies with water rights.	800	200	515	800			440	166	450	-	-	-	-	-	-	-
1b. Felton system complies with required bypass flows, but not SLRBT low-flow no-diversion requirements.										-	-	-	-	-	-	-
1c. All diversion capacities doubled; Felton system complies with water rights.	1,600	400	1,030	1,600			880	332	450	-	-	-	-	-	-	-
1d. All diversion capacities doubled; Felton system diverts without regard to water rights.										-	-	-	-	-	-	-
1e. All diversion capacities doubled; Felton system complies with required bypass flows only.										-	-	-	-	-	-	-
1f. South system imports North system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	800	200	515	800	500 *250*	780 *475*	440	166	450	*	-	-	-	-	-	-
1g1. South system imports Felton system unused potential diversions for in-lieu recharge; Felton system diverts without regard to water rights.										-	*	-	-	-	-	-
1g2. Scenario 1g1 except Felton system complies with water rights.										-	*	-	-	-	-	-
1g3. Scenario 1g1 except Felton system complies with required bypass flows only.										-	*	-	-	-	-	-
1g4. Scenario 1g2 except intertie capacities limited.										-	150	-	-	-	-	-
1h1. South system imports unused potential diversion from North and Felton systems for in-lieu recharge; Felton system diverts without regard to water rights.										*	*	*	-	-	-	-
1h2. Scenario 1h1 except Felton system comples with water rights.										*	*	*	-	-	-	-
1i. North system imports Felton system unused potential diversions for in-lieu recharge; Felton system complies with water rights.										*	*	*	-	-	-	-
1j. Scenario 1i plus South system imports unused potential diversion from North and Felton systems.										*	*	*	-	-	-	-
1k. Scenario 1j except intertie capacities limited.										300	150	150	-	-	-	-
Scenario 2 – Import from Loch Lomond																
2a. North and Felton systems import from Loch Lomond to satisfy unmet demand in Scenario 1a.	800	200	515	800	500 *250*	780 *475*	440	166	450	-	-	-	-	*	-	-
2b. Scenario 2a plus South system imports from Loch Lomond for in-lieu recharge.										-	-	-	-	*	-	-
2c. Scenario 2b plus South system also imports North system unused diversions, and North system imports unused Felton system diversions.										*	-	*	-	*	-	-
Scenario 3 – Import from Loch Lomond and Operate Olympia Aquifer Storage and Recovery																
3a. Scenario 2b plus North system operates Olympia area ASR using North system unused diversions.	800	200	515	800	500 *250*	780 *475*	440	166	450	-	-	-	-	*	400 250	-
3b. Scenario 2b plus North system operates Olympia area ASR using Felton system unused diversions.										-	-	*	-	*	-	400 285
3c. Scenarios 3a and 3b combined.										-	-	*	-	*	400 585	400
Scenario 4 – Contribute to Scotts Valley In-Lieu Recharge while Operating Olympia ASR and Importing from Loch Lomond																
4. Scenario 3c plus SVWD imports North and Felton system remaining unused potential diversions.	800	200	515	800	500 *250*	780 *475*	440	166	450	-	-	*	350	*	400 585	400

[a] Assumed prioritization of use from left to right.
[b] Well pumping capacities decline in three steps to minimum rate (*bottom value*) during critical drought periods..
[c] December-May injection capacity (top value) and June-November extraction capacity (bottom values) adjusted to inject/extract equal amounts during synthesized record.

* Not limited during simulation.

Table 6-2
Assumed Water Production and Conveyance Capacities

Synthesized Climactic Cycle		
WY	SLRBT % avg	Type[a]
1970	130%	G
1971	70%	D
1972	26%	B
1973	178%	I
1974	150%	H
1975	84%	E
1976	15%	A
1977	10%	A
1978	160%	I
1979	66%	D (A,C,E)
1980	148%	H
1981	40%	B (C)
1982	246%	M
1983	308%	N
1984	87%	E
1985	48%	C (B)
1986	184%	J
1987	26%	B
1988	22%	B
1989	27%	B
1990	21%	B
1991	33%	B (A,F)
1992	53%	C (B)
1993	121%	G
1994	31%	B
1995	193%	J
1996	137%	G
1997	155%	H
1998	222%	L
1999	95%	E
2000	122%	G (B,H)
2001	53%	C (B,D)
2002	74%	D
2003	84%	E
2004	92%	E
2005	135%	G
2006	216%	K
2007	31%	B
2008	58%	C (B,E)
2009	50%	C (A,B,E)
2010	103%	F
2011	134%	G
2012	51%	C (A,B,E,F)
2013	60%	C
2014	15%	A
2015	34%	B (A,C)
2016	83%	E (A,B)
2017	319%	N

North System		De-mand	Stream Diversions: Peavine Creek Poten-tial[b]	Peavine Creek Divert-ed	Foreman Creek Poten-tial[b]	Foreman Creek Divert-ed	Unused Potential	Clear & Sweetwater Cks Poten-tial[b]	Clear & Sweetwater Cks Divert-ed	Clear & Sweetwater Cks Unused Potential	Total Poten-tial[b]	Total Divert-ed	Total Unused Potential	Groundwater Wells: Quail Hollow	Olympia	Total	Import	Export Unused Diver-sions	Total System Use	Un-met De-mand[c]	Total Diver-sions	Unused Potential Diver-sions
		acre-feet per year (afy)																				
Historical record, WYs 2000-2017	avg	1,541	-	110	-	500	-	-	255	-	-	866	-	276	405	681	1	6	1,541	-	-	-
	%	-	-	**7%**	-	**32%**	-	-	**17%**	-	-	**56%**	-	**18%**	**26%**	**44%**	-	-	**100%**	-	-	-
	min	1,164	-	47	-	203	-	-	37	-	-	421	-	146	129	275	0	0	1,164	-	-	-
	max	1,800	-	224	-	928	-	-	380	-	-	1,128	-	461	572	1,015	10	103	1,800	-	-	-
Base Case – Simulated Historical Record																						
Calibration period, WYs 2000-2017	avg	1,564	135	110	517	507	**35**	492	263	**229**	1,144	880	264	274	403	678	0	0	1,558	6	880	264
	%	-	-	**7%**	-	**32%**	-	-	**17%**	-	-	**56%**	-	**18%**	**26%**	**43%**	-	-	**100%**	0.4%	-	-
	min	1,235	35	35	197	197	0	197	197	0	429	429	0	160	230	390	0	0	1,235	0	429	0
	max	1,776	229	143	860	854	134	732	318	498	1,822	1,228	594	423	608	1,031	0	0	1,776	65	1,228	594
Simulation period, WYs 1970-2017	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836

Felton System		De-mand	Stream Diversions: Fall & Bennett Cks Poten-tial[b]	Fall & Bennett Cks Divert-ed	Fall & Bennett Cks Unused Potential	Bull Creek Poten-tial[b]	Bull Creek Diverted	Bull Creek Unused Potential	Total Poten-tial[b]	Total Diverted	Total Unused Potential	Import	Total System Use	Total Diver-sions	Unused Potential Diver-sions
		acre-feet per year (afy)													
Historical record, WYs 2000-2017	avg	419	-	325	-	-	90	-	-	414	-	1	414	-	-
	%	-	-	**78%**	-	-	**22%**	-	-	**100%**	-	-	**100%**	-	-
	min	317	-	225	-	-	17	-	-	317	-	0	317	-	-
	max	498	-	406	-	-	128	-	-	489	-	20	489	-	-
Base Case – Simulated Historical Record															
Calibration period, WYs 2000-2017	avg	436	706	346	361	145	90	55	852	436	416	0	436	436	416
	%	-	-	**79%**	-	-	**21%**	-	-	**100%**	-	-	**100%**	-	-
	min	346	695	266	302	68	53	15	762	346	337	0	346	346	337
	max	492	710	407	436	225	120	124	926	492	560	0	492	492	560
Simulation period, WYs 1970-2017	avg	430	705	340	366	147	90	57	852	430	422	0	430	430	422
	min	335	695	266	292	68	49	15	762	335	316	0	335	335	316
	max	492	710	409	436	225	120	124	926	492	560	0	492	492	560

South System		De-mand	Pumped Groundwater	Import	Export	Total System Use	SLVWD Total	Unused North & Felton System Diversions	Total SLVWD Production
		acre-feet per year (afy)						acre-feet per year (afy)	
Historical record, WYs 2000-2017	avg	387	384	5	1	384		-	2,345
	min	259	237	0	0	237		-	1,793
	max	447	447	82	10	447		-	2,658
Base Case – Simulated Historical Record									
Calibration period, WYs 2000-2017	avg	375	374	0	0	374		680	2,368
	min	297	297	0	0	297		352	1,878
	max	432	432	0	0	432		1,145	2,642
Simulation period, WYs 1970-2017	avg	365	365	0	0	365		711	2,336
	min	297	297	0	0	297		333	1,878
	max	441	441	0	0	441		1,354	2,642

Simulated Base Case:
Calculated on a monthly timestep using daily flow duration curves.
Assumes 2045 demand and repeat of WY1970-2017 climatic cycle.
Does not reflect minor use of system interties in actual use since 2016.
See Table 6-2 for assumed diversion, conveyance, and treatment capacities.
Felton system diversions non-compliant with water rights 23% of all 576 months.

afy acre-feet per year
% percent of historical and simulated system production (South system is 100% groundwater).

avg average
min minimum
max maximum

SLRBT % avg percent of average annual SLRBT flow

[a] Water year type as defined in Tables 4-5 and 4-6; alternate types assigned to selected months given parenthetically.

[b] Within diversion capacity and water rights.

[c] Unmet North system demand results from assumed limits on groundwater production.

Table 6-3
Results of Simulated Base Case In Comparison to Historical Record

Base Case and Scenario 1 Alternatives (existing and modified infrastructure and water rights variations)	North System											Felton System										South System						
		Stream Diversions											Stream Diversions															
	Demand	Potential[a]	Diverted	Unused Potential	Groundwater Wells	Imports	Export Unused Potential Diversions	Total System Use	Unmet Demand[b]	Total Diversions Including for Export	Unused Potential Diversions	Demand	Potential[a]	Diverted	Unused Potential	Imports	Export Unused Potential Diversions	Total System Use	Unmet Demand[c]	Total Diversions Including for Export	Unused Potential Diversions	Demand	Pumped Groundwater	Imports	Exports	Total System Use	Unused North & Felton System Diversions	SLVWD Total
	acre-feet per year (afy)																											
Base case Simulated historical record (calibrated to WYs 2000-2017)	1,545	1,192	904	289	638	0	0	1,541	4	904	289	430	852	430	422	0	0	430	0	430	422	365	365	0	0	365	711	2,336
1a. Felton system complies with water rights.	1,545	1,192	904	289	638	0	0	1,541	4	904	289	430	685	378	307	0	0	378	51	378	307	365	365	0	0	365	596	2,285
1b. Felton system complies with required bypass flows, but not SLRBT low-flow no-diversion requirements.	1,545	1,192	904	289	638	0	0	1,541	4	904	289	430	775	395	381	0	0	395	35	395	381	365	365	0	0	365	669	2,301
1c. All diversion capacities doubled; Felton system complies with water rights.	1,545	1,569	966	603	575	0	0	1,541	4	966	603	430	1,175	390	785	0	0	390	40	390	785	365	365	0	0	365	1,388	2,300
1d. All diversion capacities doubled; Felton system diverts without regard to water rights.	1,545	1,569	966	603	575	0	0	1,541	4	966	603	430	1,493	430	1,064	0	0	430	0	430	1,064	365	365	0	0	365	1,667	2,336
1e. All diversion capacities doubled; Felton system complies with required bypass flows only.	1,545	1,569	966	603	575	0	0	1,541	4	966	603	430	1,290	396	893	0	0	396	33	396	893	365	365	0	0	365	1,496	2,303
1f. South system imports North system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	1,545	1,192	904	289	638	0	115	1,541	4	1,019	174	430	685	378	307	0	0	378	51	378	307	365	250	115	0	365	480	2,285
1g1. South system imports Felton system unused potential diversions for in-lieu recharge; Felton system diverts without regard to water rights.	1,545	1,192	904	289	638	0	0	1,541	4	904	289	430	852	430	422	0	281	430	0	710	142	365	84	281	0	365	431	2,336
1g2. Scenario 1g1 except Felton system complies with water rights.	1,545	1,192	904	289	638	0	0	1,541	4	904	289	430	685	378	307	0	198	378	51	577	109	365	167	198	0	365	398	2,285
1g3. Scenario 1g1 except Felton system complies with required bypass flows only.	1,545	1,192	904	289	638	0	0	1,541	4	904	289	430	775	360	381	0	252	360	35	611	129	365	113	252	0	365	418	2,266
1g4. Scenario 1g2 except intertie capacities limited.	1,545	1,192	904	289	638	0	0	1,541	4	904	289	430	685	378	307	0	165	378	51	543	142	365	200	165	0	365	431	2,285
1h1. South system imports unused potential diversion from North and Felton systems for in-lieu recharge; Felton system diverts without regard to water rights.	1,545	1,192	904	289	638	0	115	1,541	4	1,022	174	430	852	430	422	0	287	430	0	601	136	365	78	287	0	365	309	2,336
1h2. Scenario 1h1 except Felton system comples with water rights.	1,545	1,192	904	289	638	0	115	1,541	4	1,019	174	430	685	378	307	0	89	378	51	468	102	365	160	205	0	365	276	2,285
1i. North system imports Felton system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	1,545	1,192	904	289	511	128	0	1,542	0	904	289	430	685	378	307	0	128	378	51	506	179	365	365	0	0	365	468	2,286
1j. Scenario 1i plus South system imports unused potential diversion from North and Felton systems.	1,545	1,192	904	289	511	128	115	1,542	0	1,019	174	430	685	378	307	0	144	378	51	522	163	365	234	131	0	365	337	2,286
1k. Scenario 1j except intertie capacities limited.	1,545	1,192	904	289	533	105	115	1,542	0	1,019	174	430	685	378	307	0	133	378	51	512	174	365	222	143	0	365	347	2,286

Color shading relative to compliance with Felton system water rights:

- Not compliant.
- Compliant with Fall Creek required bypass flows.
- Fully compliant with SLRBT low-flow diversion thresholds.

All scenarios assume estimated 2045 demand and repeat of WY1970-2017 climatic cycle.
See Table 6-2 for overall summary of scenario alternative assumptions.
See Table 6-3 for assumed diversion, conveyance, and treatment capacities.
See Table 6-6 for more detailed results.

[a] Within diversion capacity and water rights
[b] Unmet North system demand results from assumed limits on groundwater production.
[c] Unmet Felton system demand results from water rights compliance.

Table 6-4
Summary of Simulated Base Case and Scenario 1 Conjunctive Use Alternatives, Annual Averages, WYs 1970–2017

Scenario		North System																					Felton System																South System							
			Stream Diversions																					Stream Diversions																						
			Peavine Creek		Foreman Creek			Clear & Sweetwater			Total			Groundwater Wells										Fall & Bennett Cks			Bull Creek			Total																
		De-mand	Poten-tial*	Divert-ed	Poten-tial*	Divert-ed	Un-used Poten-tial	Poten-tial*	Divert-ed	Un-used Poten-tial	Poten-tial [a]	Divert-ed	Un-used Poten-tial	Quail Hollow	Olym-pia	Total	Im-port/ ASR Ex-tract	Ex-port/ Inject Unused Pot. Div.	Total Sys-tem Use	Un-met De-mand [b]	Total Diver-sions Includ-ing for Export	Unused Poten-tial Diver-sions	De-mand	Poten-tial*	Divert-ed	Un-used Poten-tial	Poten-tial*	Divert-ed	Un-used Poten-tial	Poten-tial [a]	Divert-ed	Un-used Poten-tial	Im-port/ ASR Ex-tract	Ex-port/ Inject Unused Pot. Div.	Total System Use	Un-met De-mand [c]	Total Diver-sions Includ-ing for Export	Un-used Poten-tial Diver-sions	De-mand	Pumped Ground-water	Im-port	Ex-port	Total System Use	Un-used North & Felton Diver-sions	Scotts Valley In-Lieu Re-charge	SLVWD Total
		acre-feet per year (afy)																																												
Base Case Simulated historical record (calibrated to WYs 2000-2017)	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289	430	705	340	366	147	90	57	852	430	422	0	0	430	0	430	422	365	365	0	0	365	711	0	2,336
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	695	266	292	68	49	15	762	335	316	0	0	335	0	335	316	297	297	0	0	297	333	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836	492	710	409	436	225	120	124	926	492	560	0	0	492	0	492	560	441	441	0	0	441	1,354	0	2,642
Scenario 1 – Alternatives using existing and modified infrastructure and variations in water rights																																														
1a. Felton system complies with water rights.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289	430	547	338	208	139	40	99	685	378	307	0	0	378	51	378	307	365	365	0	0	365	596	0	2,285
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	0	186	0	186	23	297	297	0	0	297	23	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836	492	678	408	348	222	50	186	900	455	534	0	0	455	187	455	534	441	441	0	0	441	1,328	0	2,636
1b. Felton system complies with required bypass flows, but not SLRBT low-flow no diversion requirements.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289	430	628	304	324	147	90	57	775	395	381	0	0	395	35	395	381	365	365	0	0	365	669	0	2,301
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	505	219	207	68	49	15	572	268	231	0	0	268	0	268	231	297	297	0	0	297	247	0	1,826
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836	492	706	350	436	225	120	124	926	457	560	0	0	457	85	457	560	441	441	0	0	441	1,354	0	2,635
1c. All diversion capacities doubled; Felton system complies with water rights.	avg	1,545	207	127	654	549	185	708	290	418	1,569	966	603	234	342	575	0	0	1,541	4	966	603	430	989	352	638	186	38	147	1,175	390	785	0	0	390	40	390	785	365	365	0	0	365	1,388	0	2,300
	min	1,235	36	36	198	198	0	200	200	0	433	433	0	23	32	55	0	0	1,235	0	433	0	335	279	200	51	34	21	11	313	221	62	0	0	221	0	221	62	297	297	0	0	297	62	0	1,792
	max	1,776	453	202	1,529	976	804	1,367	336	1,094	3,349	1,451	1,898	424	610	1,034	0	0	1,776	64	1,451	1,898	492	1,355	415	1,025	338	47	301	1,694	461	1,327	0	0	461	147	461	1,327	441	441	0	0	441	3,183	0	2,642
1d. All diversion capacities doubled; Felton system diverts without regard to water rights.	avg	1,545	207	127	654	549	185	708	290	418	1,569	966	603	234	342	575	0	0	1,541	4	966	603	430	1,300	339	961	194	91	103	1,493	430	1,064	0	0	430	0	430	1,064	365	365	0	0	365	1,667	0	2,336
	min	1,235	36	36	198	198	0	200	200	0	433	433	0	23	32	55	0	0	1,235	0	433	0	335	1,092	266	745	73	49	20	1,166	335	768	0	0	335	0	335	768	297	297	0	0	297	768	0	1,878
	max	1,776	453	202	1,529	976	804	1,367	336	1,094	3,349	1,451	1,898	424	610	1,034	0	0	1,776	64	1,451	1,898	492	1,412	408	1,138	340	120	239	1,744	492	1,377	0	0	492	0	492	1,377	441	441	0	0	441	3,233	0	2,642
1e. All diversion capacities doubled; Felton system complies with required bypass flows only.	avg	1,545	207	127	654	549	185	708	290	418	1,569	966	603	234	342	575	0	0	1,541	4	966	603	430	1,096	306	781	194	91	103	1,290	396	893	0	0	396	33	396	893	365	365	0	0	365	1,496	0	2,303
	min	1,235	36	36	198	198	0	200	200	0	433	433	0	23	32	55	0	0	1,235	0	433	0	335	741	221	90	73	49	20	814	270	497	0	0	270	0	270	497	297	297	0	0	297	497	0	1,826
	max	1,776	453	202	1,529	976	804	1,367	336	1,094	3,349	1,451	1,898	424	610	1,034	0	0	1,776	64	1,451	1,898	492	1,401	353	1,135	340	120	239	1,742	457	1,375	0	0	457	82	457	1,375	441	441	0	0	441	3,231	0	2,635
1f. South system imports North system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	115	1,541	4	1,019	174	430	547	338	208	139	40	99	685	378	307	0	0	378	51	378	307	365	250	115	0	365	480	0	2,285
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	0	186	0	186	23	297	13	0	0	297	23	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	329	1,776	65	1,559	507	492	678	408	348	222	50	186	900	455	534	0	0	455	187	455	534	441	417	329	0	441	999	0	2,636
1g1. South system imports Felton system unused potential diversions for in-lieu recharge; Felton system diverts without regard to water rights.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289	430	705	340	366	147	90	57	852	430	422	0	281	430	0	710	142	365	84	281	0	365	431	0	2,336
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	695	266	292	68	49	15	762	335	316	0	230	335	0	616	77	297	1	230	0	297	96	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836	492	710	409	436	225	120	124	926	492	560	0	323	492	0	778	237	441	182	323	0	441	1,033	0	2,642
1g2. Scenario 1g1 except Felton system complies with water rights.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289	430	547	338	208	139	40	99	685	378	307	0	198	378	51	577	109	365	167	198	0	365	398	0	2,285
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	23	186	0	236	0	297	13	23	0	297	0	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836	492	678	408	348	222	50	186	900	455	534	0	311	455	187	741	223	441	319	311	0	441	1,024	0	2,636
1g3. Scenario 1g1 except Felton system complies with required bypass flows only.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289	430	628	304	324	147	90	57	775	360	381	0	252	360	35	611	129	365	113	252	0	365	418	0	2,266
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	505	219	207	68	49	15	572	201	231	0	167	201	0	398	60	297	1	167	0	297	75	0	1,772
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836	492	706	350	436	225	120	124	926	447	560	0	328	447	85	770	237	441	247	328	0	441	1,033	0	2,627
1g4. Scenario 1g2 except intertie capacities limited.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289	430	547	338	208	139	40	99	685	378	307	0	165	378	51	543	142	365	200	165	0	365	431	0	2,285
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	23	186	0	229	0	297	99	23	0	297	0	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836	492	678	408	348	222	50	186	900	455	534	0	226	455	187	676	308	441	328	226	0	441	1,102	0	2,636
1h1. South system imports unused potential diversion from North and Felton systems for in-lieu recharge; Felton system diverts without regard to water rights.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	115	1,541	4	1,022	174	430	705	340	366	147	90	57	852	430	422	0	287	430	0	601	136	365	78	287	0	365	309	0	2,336
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	695	266	292	68	49	15	762	335	316	0	230	335	0	421	77	297	0	230	0	297	80	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	329	1,776	65	1,559	507	492	710	409	436	225	120	124	926	492	560	0	362	492	0	702	236	441	182	362	0	441	683	0	2,642
1h2. Scenario 1h1 except Felton system comples with water rights.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	115	1,541	4	1,019	174	283	547	338	208	139	40	99	685	378	307	0	89	378	51	468	102	365	160	205	0	365	276	0	2,285
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	0	209	158	23	29	28	0	237	186	23	0	13	186	0	236	0	297	0	23	0	297	0	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	329	1,776	65	1,559	507	815	678	408	348	222	50	186	900	455	534	0	155	455	187	533	222	441	319	344	0	441	657	0	2,636
1i. North system imports Felton system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	209	302	511	128	0	1,542	0	904	289	430	547	338	208	139	40	99	685	378	307	0	128	378	51	506	179	365	365	0	0	365	468	0	2,286
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	39	52	91	23	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	23	186	0	237	0	297	297	0	0	297	0	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	416	598	1,014	266	0	1,776	0	1,231	836	492	678	408	348	222	50	186	900	455	534	0	266	455	187	677	308	441	441	0	0	441	1,144	0	2,636
1j. Scenario 1i plus South system imports unused potential diversion from North and Felton systems.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	209	302	511	128	115	1,542	0	1,019	174	430	547	338	208	139	40	99	685	378	307	0	144	378	51	522	163	365	234	131	0	365	337	0	2,286
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	39	52	91	23	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	23	186	0	237	0	297	13	0	0	297	0	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	416	598	1,014	266	329	1,776	0	1,559	507	492	678	408	348	222	50	186	900	455	534	0	340	455	187	677	308	441	382	402	0	441	815	0	2,636
1k. Scenario 1j except intertie capacities limited.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	218	315	533	105	115	1,542	0	1,019	174	430	547	338	208	139	40	99	685	378	307	0	133	378	51	512	174	365	222	143	0	365	347	0	2,286
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	65	90	155	23	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	23	186	0	237	0	297	0	0	0	297	0	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	416	598	1,014	176	328	1,776	0	1,558	509	492	678	408	348	222	50	186	900	455	534	0	233	455	187	645	357	441	372	412	0	441	866	0	2,636

Color shading relative to compliance with Felton system water rights:
- Not compliant.
- Compliant with Fall Creek required bypass flows.
- Fully compliant with SLRBT low-flow diversion thresholds.

All scenarios assume estimated 2045 demand and repeat of WY1970-2017 climatic cycle.
See Table 6-1 for overall summary of scenario alternative assumptions.
See Table 6-2 for assumed diversion, conveyance, and treatment capacities.

[a] Within Diversion Capacity and Water Rights
[b] Unmet North system demand results from assumed limits on groundwater production.
[c] Unmet Felton system demand results from water rights compliance.

avg average
min minimum
max maximum

Table 6-5
Results of Base Case and Scenario 1 Conjunctive Use Simulations, WYs 1970–2017

Scenario			Percent of Monthly Flow Remaining Downstream of Diversion							Percent of Drought Minimum Baseflow Remaining as a Result of Groundwater Pumping[c]						Percent of Months Felton Non-compliant
			Peavine Creek[a]	Fore-man Creek[a]	Boulder Creek[b]	Clear & Sweet-water Creeks[a]	Fall & Bennett Creeks[a]	Bull Creek[a]	San Lorenzo R at Big Trees[b]	Newell Creek at SLR	Zayante Ck above Bean Ck	Bean Ck at Zayante Ck	Zayante Ck at SLR	San Lorenzo R above Fall Ck	San Lorenzo R at Big Trees	
Base Case	Simulated historical record (calibrated to WYs 2000-2017)	avg	63	26	86	51	83	64	95	53	49	47	47	93	72	23
		min	40	10	65	19	32	32	86							
		max	96	81	99	100	99	94	100							
Scenario 1 Alternatives Using Existing and Modified Infrastructure and Water Rights Variations	**1a.** Felton system complies with water rights.	avg	63	26	86	51	86	82	96	53	49	47	47	93	72	0
		min	40	10	65	19	42	53	87							
		max	96	81	99	100	99	99	100							
	1b. Felton system complies with required bypass flows, but not SLRBT low-flow no-diversion requirements.	avg	63	26	86	51	86	64	95	53	49	47	47	93	72	21
		min	40	10	65	19	49	32	88							
		max	96	81	99	100	99	94	100							
	1c. All diversion capacities doubled; Felton system complies with water rights.	avg	59	24	85	47	85	83	95	57	54	47	48	94	73	0
		min	33	8	64	17	42	53	87							
		max	95	81	99	100	99	99	100							
	1d. All diversion capacities doubled; Felton system diverts without regard to water rights.	avg	59	24	85	47	83	64	95	57	54	47	48	94	73	16
		min	33	8	64	17	32	32	86							
		max	95	81	99	100	99	94	100							
	1e. All diversion capacities doubled; Felton system complies with required bypass flows only.	avg	59	24	85	47	86	64	95	57	54	47	48	94	73	14
		min	33	8	64	17	49	32	89							
		max	95	81	99	100	99	94	100							
	1f. South system imports North system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	avg	62	25	86	43	86	82	95	53	49	51	50	93	73	0
		min	40	10	65	17	42	53	87							
		max	94	80	99	97	99	99	100							
	1g1. South system imports Felton system unused potential diversions for in-lieu recharge; Felton system diverts without regard to water rights.	avg	63	26	86	51	72	58	94	53	49	56	55	93	76	23
		min	40	10	65	19	16	27	83							
		max	96	81	99	100	99	90	100							
	1g2. Scenario 1g1 except Felton system complies with water rights.	avg	63	26	86	51	82	64	95	53	49	53	53	93	75	0
		min	40	10	65	19	40	27	85							
		max	96	81	99	100	99	99	100							
	1g3. Scenario 1g1 except Felton system complies with required bypass flows only.	avg	63	26	86	51	78	58	94	53	49	55	54	93	75	15
		min	40	10	65	19	39	27	86							
		max	96	81	99	100	99	90	100							
	1g4. Scenario 1g2 except intertie capacities limited.	avg	63	26	86	51	82	68	95	53	49	52	52	93	74	0
		min	40	10	65	19	40	34	86							
		max	96	81	99	100	99	99	100							
	1h1. South system imports unused potential diversion from North and Felton systems for in-lieu recharge; Felton system diverts without regard to water rights.	avg	62	25	86	43	73	63	94	53	49	57	55	93	76	23
		min	40	10	65	17	16	28	83							
		max	94	80	99	97	99	94	100							
	1h2. Scenario 1h1 except Felton system comples with water rights.	avg	62	25	86	43	83	73	95	53	49	54	53	93	75	0
		min	40	10	65	17	40	28	85							
		max	94	80	99	97	99	99	100							
	1i. North system imports Felton system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	avg	63	26	86	51	83	69	95	62	59	48	50	95	74	0
		min	40	10	65	19	40	27	85							
		max	96	81	99	100	99	99	100							
	1j. Scenario 1i plus South system imports unused potential diversion from North and Felton systems.	avg	62	25	86	43	82	67	95	62	59	53	54	95	75	0
		min	40	10	65	17	40	27	85							
		max	94	80	99	97	99	99	100							
	1k. Scenario 1j except intertie capacities limited.	avg	63	25	86	43	82	68	95	60	57	53	54	94	75	0
		min	40	10	65	17	40	27	85							
		max	96	80	99	97	99	99	100							

Ck creek
R river
SLR San Lorenzo River
SLRBT San Lorenzo River at Big Trees

avg average
min minimum
max maximum

[a] Calculated monthly as:
100 x {1 - [(diversions) ÷ (unimpaired flow)]}

[b] Calculated monthly as:
100 x [1 - [(diversions) ÷ (impaired flow + base case diversions)].

Only considers effects of SLVWD stream diversions.

[c] Calculated using method presented in Table 5-3.
Only considers effects of SLVWD, SVWD, and MHA groundwater pumping.

Color shading relative to compliance with Felton system water rights:

Not compliant.

Compliant with Fall Creek required bypass flows.

Fully compliant with SLRBT low-flow diversion thresholds.

Table 6-6
Base Case and Scenario 1 Simulated Percent of Downstream Flow Remaining

Scenario		Simulated Intertie Use						Average Simulated Reduction in Pumping[b]			
		North System to South System		Felton System to South System		Felton System to North System		North System[c]		South System	
		Annual	Max. Rate[a]	Annual	Max. Rate[a]	Annual	Max. Rate[a]				
		afy	gpm	afy	gpm	afy	gpm	afm	%	afm	%
1f. South system imports North system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	avg	115	337	0	0	0	0	0.0	0.0%	10	32%
	min	0									
	max	329									
1g1. South system imports Felton system unused potential diversions for in-lieu recharge; Felton system diverts without regard to water rights.	avg	0	0	281	292	0	0	0.3	0.6%	23	77%
	min			230							
	max			323							
1g2. Scenario 1g1 except Felton system complies with water rights.	avg	0	0	198	292	0	0	0.3	0.6%	17	54%
	min			23							
	max			311							
1g3. Scenario 1g1 except Felton system complies with required bypass flows only.	avg	0	0	252	292	0	0	0.3	0.6%	21	69%
	min			167							
	max			328							
1g4. Scenario 1g2 except intertie capacities limited.	avg	0	0	165	153	0	0	0.3	0.6%	14	45%
	min			23							
	max			226							
1h1. South system imports unused potential diversion from North and Felton systems for in-lieu recharge; Felton system diverts without regard to water rights.	avg	115	337	287	340	0	0	0.3	0.6%	24	79%
	min	0		230							
	max	329		362							
1h2. Scenario 1h1 except Felton system comples with water rights.	avg	115	337	89	241	0	0	0.3	0.6%	17	56%
	min	0		13							
	max	329		155							
1i. North system imports Felton system unused potential diversions for in-lieu recharge; Felton system complies with water rights.	avg	0	0	0	0	128	355	11	20%	0	0%
	min					23					
	max					266					
1j. Scenario 1i plus South system imports unused potential diversion from North and Felton systems.	avg	115	337	16	181	144	355	11	20%	11	36%
	min	0		0		23					
	max	329		73		340					
1k. Scenario 1j except intertie capacities limited.	avg	115	306	28	153	105	173	9	17%	12	39%
	min	0		0		23					
	max	328		84		176					

[a] Equivalent continuous rate for simulated maximum monthly rate.
[b] Compared to the base case; expressed in acre-feet per month for comparison to minimum monthly baseflows.
[c] Small reduction from imports needed to offset base-case unmet demand when well production insufficient.

Color shading relative to compliance with Felton system water rights:
- Not compliant.
- Compliant with Fall Creek required bypass flows.
- Fully compliant with SLRBT low-flow diversion thresholds.

afm acre-feet per month
afy acre-feet per year
gpm gallons per minute

avg average
min minimum
max maximum

Table 6-7

Scenario 1 Simulated Use of System Interties and Resulting Reductions in Groundwater Pumping

Scenario	North System											Felton System										South System					Scotts Valley In-Lieu Recharge	Unused North & Felton System Diversions	SLVWD Total
		Stream Diversions											Stream Diversions																
	Demand	Potential[a]	Diverted	Unused Potential	Groundwater Wells[b]	Imports / ASR Extractions	Exports / Inject Unused Potential Diversions	Total System Use	Unmet Demand[c]	Total Diversions Including for Export	Unused Potential Diversions	Demand	Potential[a]	Diverted	Unused Potential	Imports	Exports / Inject Unused Potential Diversions	Total System Use	Unmet Demand[d]	Total Diversions Including for Export	Unused Potential Diversions	Demand	Pumped Groundwater	Imports	Exports	Total System Use			
	acre-feet per year (afy)																												
Base case--Synthesized historical record	1,545	1,192	904	289	638	0	0	1,541	4	904	289	430	852	430	422	0	0	430	0	430	422	365	365	0	0	365	0	711	2,336
Scenario 1 – Selected Results (from Table 6-4)																													
1a. Felton system complies with water rights.	1,545	1,192	904	289	638	0	0	1,541	4	904	289	430	685	378	307	0	0	378	51	378	307	365	365	0	0	365	0	596	2,285
1j. North system imports Felton system unused potential diversions for in-lieu recharge (Scenario 1i) plus South system imports unused potential diversion from North and Felton systems.	1,545	1,192	904	289	511	128	115	1,542	0	1,019	174	430	685	378	307	0	144	378	51	522	163	365	234	131	0	365	0	337	2,286
Scenario 2 – Import from Loch Lomond																													
2a. North and Felton systems import from Loch Lomond to satisfy unmet demand in Scenario 1a.	1,545	1,192	904	289	638	4	0	1,545	0	904	289	430	685	378	307	51	0	430	0	378	307	365	365	0	0	365	0	596	2,340
2b. Scenario 2a plus South system imports from Loch Lomond for in-lieu recharge.	1,545	1,192	904	289	638	4	0	1,545	0	904	289	430	685	378	307	51	0	430	0	378	307	365	119	246	0	365	0	596	2,340
2c. Scenario 2b plus South system also imports North system unused diversions, and North system imports unused Felton system diversions.	1,545	1,192	904	289	510	132	21	1,545	0	925	268	430	685	378	307	51	128	430	0	506	179	365	98	267	0	365	0	447	2,340
Scenario 3 – Import from Loch Lomond and Operate Olympia Aquifer Storage and Recovery																													
3a. Scenario 2b plus North system operates Olympia area ASR using North system unused diversions.	1,545	1,192	904	99	448	194	190	1,545	0	1,093	99	430	685	378	307	51	0	430	0	378	307	365	116	249	0	365	0	406	2,340
3b. Scenario 2b plus North system operates Olympia area ASR using Felton system unused diversions.	1,545	1,192	904	289	422	220	0	1,545	0	904	289	430	685	378	85	51	222	430	0	600	85	365	116	249	0	365	0	374	2,340
3c. Scenarios 3a and 3b combined.	1,545	1,192	904	99	229	412	190	1,545	0	1,093	99	430	685	378	85	51	222	430	0	600	85	365	116	249	0	365	0	185	2,340
Scenario 4 – Contribute to Scotts Valley In-Lieu Recharge while Operating Olympia ASR and Importing from Loch Lomond																													
4. Scenario 3c plus SVWD imports North and Felton system remaining unused potential diversions.	1,545	1,192	904	99	229	412	190	1,545	0	1,093	9	430	685	378	85	51	222	430	0	600	8	365	116	249	0	365	167	17	2,340

All scenarios assume estimated 2045 demand and repeat of WY1970-2017 climatic cycle
Felton system diversions as currently permitted, all scenarios.
See Table 6-2 for overall summary of scenario alternative assumptions.
See Table 6-3 for assumed diversion, conveyance, and treatment capacities.
See Table 6-7 for more detailed results.

[a] Within diversion capacity and water rights
[b] Does not include ASR extractions.
[c] Unmet North system demand results from assumed limits on groundwater production.
[d] Unmet Felton system demand results from water rights compliance.

Table 6-8
Summary of Simulated Scenario 2, 3, and 4 Conjunctive Use Alternatives, Annual Averages, WYs 1970–2017

Scenario[a]		North System																					Felton System																South System							
			Stream Diversions																					Stream Diversions																						
			Peavine Creek		Foreman Creek			Clear & Sweetwater			Total			Groundwater Wells										Fall & Bennett Cks			Bull Creek			Total																
		De-mand	Poten-tial[b]	Divert-ed	Poten-tial[b]	Divert-ed	Un-used Poten-tial	Poten-tial[b]	Divert-ed	Un-used Poten-tial	Poten-tial[b]	Divert-ed	Un-used Poten-tial	Quail Hollow	Olym-pia	Total	Im-port/ ASR Ex-tract	Ex-port/ Inject Unused Pot. Div.	Total Sys-tem Use	Un-met De-mand[c]	Total Diver-sions Includ-ing for Export	Unused Poten-tial Diver-sions	De-mand	Poten-tial[b]	Divert-ed	Un-used Poten-tial	Poten-tial[b]	Divert-ed	Un-used Poten-tial	Poten-tial[b]	Divert-ed	Un-used Poten-tial	Im-port/ ASR Ex-tract	Ex-port/ Inject Unused Pot. Div.	Total System Use	Un-met De-mand[d]	Total Diver-sions Includ-ing for Export	Unuse d Poten-tial Diver-sions	De-mand	Pumped Ground-water	Im-port	Ex-port	Total System Use	Unused N Sys & Felton divs	Scotts Valley In-Lieu Re-charge	SLVWD Total
		acre-feet per year (afy)																																												
Base Case Simulated historical record (calibrated to WYs 2000-2017)	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289	430	705	340	366	147	90	57	852	430	422	0	**0**	430	0	430	422	365	365	0	0	365	711	0	2,336
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	695	266	292	68	49	15	762	335	316	0	0	335	0	335	316	297	297	0	0	297	333	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836	492	710	409	436	225	120	124	926	492	560	0	0	492	0	492	560	441	441	0	0	441	1,354	0	2,642
Scenario 1 – Selected Results (from Table 6-6)																																														
1a. Felton system complies with water rights.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	0	0	1,541	4	904	289	430	547	338	208	139	40	99	685	378	307	0	0	378	51	378	307	365	365	0	0	365	596	0	2,285
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	0	186	0	186	23	297	297	0	0	297	23	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	0	0	1,776	65	1,231	836	492	678	408	348	222	50	186	900	455	534	0	0	455	187	455	534	441	441	0	0	441	1,328	0	2,636
1j. North system imports Felton system unused potential diversions for in-lieu recharge (Scenario 1i) plus South system imports unused potential diversion from North and Felton systems.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	209	302	**511**	**128**	**115**	1,542	0	1,019	174	430	547	338	208	139	40	99	685	378	307	0	144	378	51	522	163	365	234	131	0	365	337	0	2,286
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	39	52	91	23	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	23	186	0	237	0	297	13	0	0	297	0	0	1,757
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	416	598	1,014	266	329	1,776	0	1,559	507	492	678	408	348	222	50	186	900	455	534	0	340	455	187	677	308	441	382	402	0	441	815	0	2,636
Scenario 2 – Import from Loch Lomond																																														
2a. North and Felton systems import from Loch Lomond to satisfy unmet demand in Scenario 1a.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	4	0	1,545	0	904	289	430	547	338	208	139	40	99	685	378	307	51	0	430	0	378	307	365	365	0	0	365	596	0	2,340
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	0	335	0	186	23	297	297	0	0	297	23	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	65	0	1,776	0	1,231	836	492	678	408	348	222	50	186	900	455	534	187	0	492	0	455	534	441	441	0	0	441	1,328	0	2,642
2b. Scenario 2a plus South system imports from Loch Lomond for in-lieu recharge.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	259	378	638	4	0	1,545	0	904	289	430	547	338	208	139	40	99	685	378	307	51	0	430	0	378	307	365	119	246	0	365	596	0	2,340
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	0	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	0	335	0	186	23	297	50	121	0	297	23	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	65	0	1,776	0	1,231	836	492	678	408	348	222	50	186	900	455	534	187	0	492	0	455	534	441	225	292	0	441	1,328	0	2,642
2c. Scenario 2b plus South system also imports North system unused diversions, and North system imports unused Felton system diversions.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	208	302	510	132	21	1,545	0	925	268	430	547	338	208	139	40	99	685	378	307	51	128	430	0	506	179	365	98	267	0	365	447	0	2,340
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	113	162	275	23	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	23	335	0	237	0	297	0	121	0	297	0	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	425	612	1,038	331	73	1,776	0	1,303	775	492	678	408	348	222	50	186	900	455	534	187	266	492	0	677	308	441	217	365	0	441	1,082	0	2,642
Scenario 3 – Import from Loch Lomond and Operate Olympia Aquifer Storage and Recovery																																														
3a. Scenario 2b plus North system operates Olympia area ASR using North system unused diversions.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	99	183	264	448	194	190	1,545	0	1,093	99	430	547	338	208	139	40	99	685	378	307	51	**0**	430	0	378	307	365	116	249	0	365	406	0	2,340
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	51	74	125	150	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	23	0	0	335	0	186	23	297	50	126	0	297	23	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	515	343	493	836	202	322	1,776	0	1,552	515	492	678	408	348	222	50	186	900	455	534	187	0	492	0	455	534	441	225	292	0	441	1,006	0	2,642
3b. Scenario 2b plus North system operates Olympia area ASR using Felton system unused diversions.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	289	173	249	422	220	0	1,545	0	904	289	430	547	338	208	139	40	99	685	378	85	51	**222**	430	0	600	85	365	116	249	0	365	374	0	2,340
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	44	63	107	169	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	19	0	0	335	0	186	19	297	50	126	0	297	23	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	836	331	476	807	230	0	1,776	0	1,231	836	492	678	408	348	222	50	186	900	455	222	187	312	492	0	731	222	441	225	292	0	441	1,029	0	2,642
3c. Scenarios 3a and 3b combined.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	99	94	135	229	412	190	1,545	0	1,093	99	430	547	338	208	139	40	99	685	378	85	51	**222**	430	0	600	85	365	116	249	0	365	185	0	2,340
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	13	18	31	241	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	19	0	0	335	0	186	19	297	50	126	0	297	19	0	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	515	231	333	565	473	322	1,776	0	1,552	515	492	678	408	348	222	50	186	900	455	222	187	312	492	0	731	222	441	225	292	0	441	708	0	2,642
Scenario 4 – Contribute to Scotts Valley In-Lieu Recharge while Operating Olympia ASR and Importing from Loch Lomond																																														
4. Scenario 3c plus SVWD imports North and Felton system remaining unused potential diversions.	avg	1,545	141	112	543	528	44	509	264	245	1,192	904	99	94	135	229	412	190	1,545	0	1,093	9	430	547	338	208	139	40	99	685	378	85	51	222	430	0	600	8	365	116	249	0	365	17	167	2,340
	min	1,235	35	35	197	197	0	197	139	0	429	429	0	13	18	31	241	0	1,235	0	429	0	335	209	158	23	29	28	0	237	186	19	0	0	335	0	186	0	297	50	126	0	297	0	19	1,878
	max	1,776	257	154	1,008	937	174	802	325	663	2,067	1,231	515	231	333	565	473	322	1,776	0	1,552	145	492	678	408	348	222	50	186	900	455	222	187	312	492	0	731	62	441	225	292	0	441	207	500	2,642

All scenarios assume estimated 2045 demand and repeat of WY1970-2017 climatic cycle.
Felton system diversions as currently permitted, all scenarios.
See Table 6-1 for overall summary of scenario alternative assumptions.
See Table 6-2 for assumed diversion, conveyance, and treatment capacities.

[a] Scenarios 2abc, 3abc, and 4 Felton system complies with water rights.
[b] Within diversion capacity and water rights.
[c] Unmet North system demand results from assumed limits on groundwater production.
[d] Unmet Felton system demand results from water rights compliance.

afy acre-feet per year
avg average
min minimum
max maximum

Table 6-9
Results of Scenario 2, 3, and 4 Conjunctive Use Simulations, WYs 1970–2017

Scenario		Intertie Use (excluding for Loch Lomond)								Use of Loch Lomond Allotment										ASR of Unused Diversions				Average Reduction in Pumping[b]			
		North System to South System		Felton System to South System		Felton System to North System		SLVWD to SVWD		Export to: North System		Export to: Felton System		Export to: South System		Total	Max. Rate[a]	SLVWD Allotment Remaining at End of WY (313 afy total)		Injection		Extraction		North System[c]		South System	
		Annual	Max. Rate[a]	Annual	Max. Rate[a]	Annual	Max. Rate[a]	Annual	Max. Rate[a]	Annual	Max. Rate[a]	Annual	Max. Rate[a]	Annual	Max. Rate[a]					Capa-city	Dec-May	Capa-city	Jun-Nov				
		afy	gpm	afy	gpm	afy	gpm	afy	gpm	afy	gpm	afy	gpm	afy	gpm	afy	gpm	af	%	gpm	afy	gpm	afy	afm	%	afm	%
Scenario 2 – Import from Loch Lomond																											
2a. North and Felton systems import from Loch Lomond to satisfy unmet demand in Scenario 1a.	avg	0	0	0	0	0	0	0	0	4	217	51	311	0	0	55	311	262	84%	-	-	-	-	0.3	0.6%	0	0%
	min									0		0		0	0	0		126	40%	-	-	-	-				
	max									65		187		0	0	192		313	100%	-	-	-	-				
2b. Scenario 2a plus South system imports from Loch Lomond for in-lieu recharge.	avg	0	0	0	0	0	0	0	0	4	217	51	311	246	194	301	311	12	4%	-	-	-	-	0.3	0.6%	20	67%
	min									0		0		121		274		0	0%	-	-	-	-				
	max									65		187		292		313		39	13%	-	-	-	-				
2c. Scenario 2b plus South system also imports North system unused diversions, and North system imports unused Felton system diversions.	avg	21	153	0	0	128	355	0	0	4	217	51	311	246	194	301	434	12	4%	-	-	-	-	11	21%	22	73%
	min	0		0		23				0		0		121		274		0	0%	-	-	-	-				
	max	73		0		266				65		187		292		313		39	13%	-	-	-	-				
Scenario 3 – Import from Loch Lomond and Operate Olympia Aquifer Storage and Recovery																											
3a. Scenario 2b plus North system operates Olympia area ASR using North system unused diversions.	avg	0	0	0	0	0	0	0	0	0	0	51	311	249	194	301	434	12	4%	400	190	250	194	16	30%	21	68%
	min									0		0		126		274		0	0%		0		150				
	max									0		187		292		313		39	13%		322		202				
3b. Scenario 2b plus North system operates Olympia area ASR using Felton system unused diversions.	avg	0	0	0	0	222	285	0	0	0	0	51	311	249	194	301	434	12	4%	400	222	285	220	18	34%	21	68%
	min					0						0		126		274		0	0%		0		169				
	max					312						187		292		313		39	13%		312		230				
3c. Scenarios 3a and 3b combined.	avg	0	0	0	0	222	285	0	0	0	0	51	311	249	194	301	434	12	4%	400	411	585	412	34	64%	21	68%
	min					0						0		126		274		0	0%		0		241				
	max					312						187		292		313		39	13%		634		473				
Scenario 4 – Contribute to Scotts Valley In-Lieu Recharge while Operating Olympia ASR and Importing from Loch Lomond																											
4. Scenario 3c plus SVWD imports North and Felton system remaining unused potential diversions.	avg	0	0	0	0	222	285	167	350	0	0	51	311	249	194	301	434	12	4%	400	411	585	412	34	64%	21	68%
	min					0		19				0		126		274		0	0%		0		241				
	max					312		500				187		292		313		39	13%		634		473				

[a] Equivalent continuous rate for simulated maximum monthly rate.
[b] Expressed in acre-feet per month for comparison to minimum monthly baseflows.
[c] Small reduction from imports needed to offset base-case unmet demand when well production insufficient.

afm acre-feet per month
afy acre-feet per year
gpm gallons per minute

avg average
min minimum
max maximum

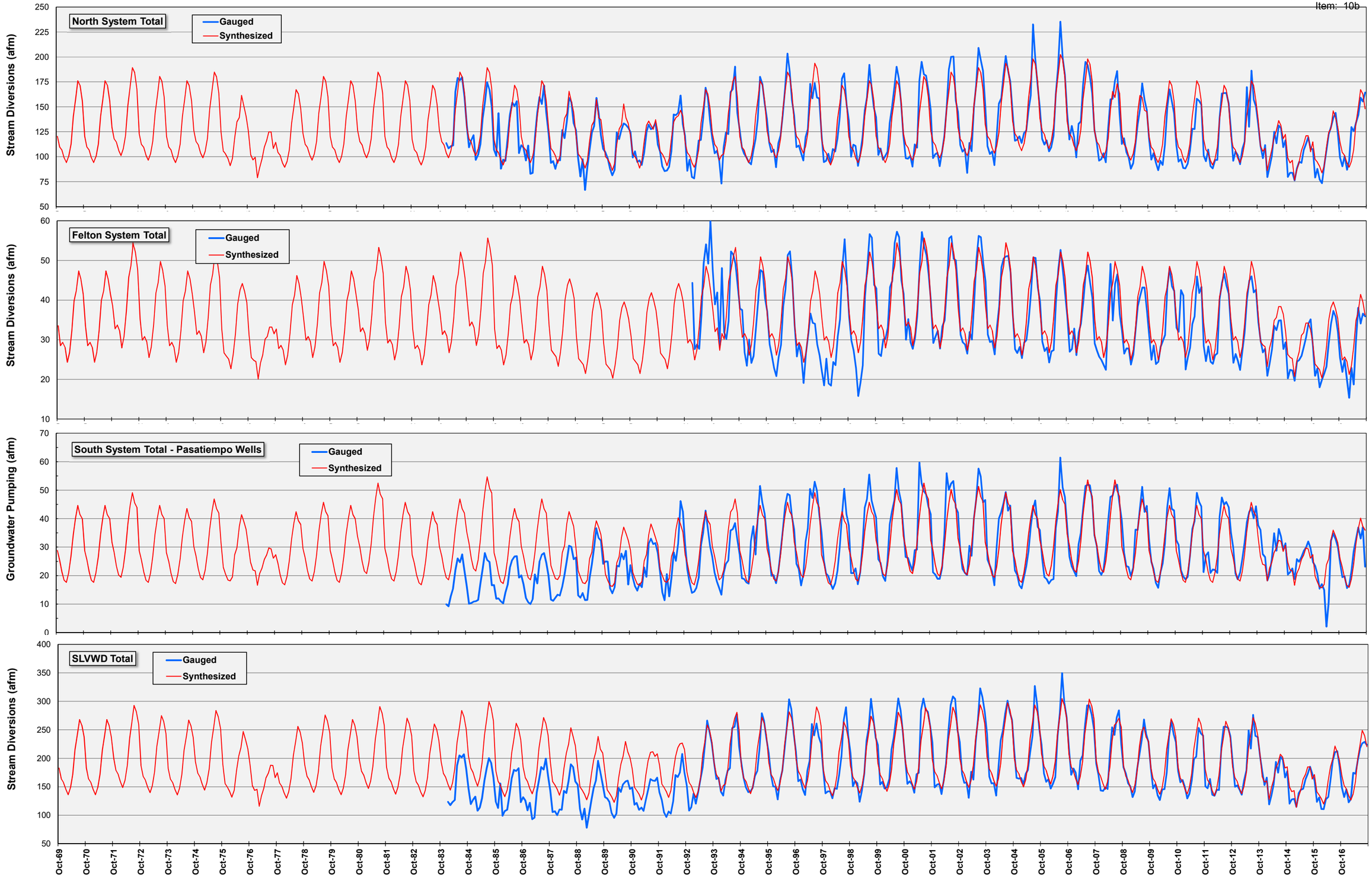
Table 6-10
Scenarios 2, 3, and 4 Simulated Use of System Interties, Loch Lomond, and Olympia ASR and Resulting Reductions in Groundwater Pumping

Scenario			Percent of Monthly Flow Remaining Downstream of Diversion							Percent of Drought Minimum Baseflow Remaining as a Result of Groundwater Pumping[c]						Percent of Months Felton Non-compliant
			Peavine Creek[a]	Fore-man Creek[a]	Boulder Creek[b]	Clear & Sweet-water Creeks[a]	Fall & Bennett Creeks[a]	Bull Creek[a]	San Lorenzo R at Big Trees[b]	Newell Creek at SLR	Zayante Ck above Bean Ck	Bean Ck at Zayante Ck	Zayante Ck at SLR	San Lorenzo R above Fall Ck	San Lorenzo R at Big Trees	
Base Case	Simulated historical record (calibrated to WYs 2000-2017)	avg	63	26	88	51	83	64	96	53	49	47	47	93	72	23
		min	40	10	72	19	32	32	89							
		max	96	81	99	100	99	94	100							
		P_{10}	46	13	81	23	56	41	92							
Scenario 2 – Import from Loch Lomond	**2a.** North and Felton systems import from Loch Lomond to satisfy unmet demand in Scenario 1a.	avg	63	26	86	51	86	82	96	53	49	47	47	93	72	0
		min	40	10	65	19	42	53	87							
		max	96	81	99	100	99	99	100							
	2b. Scenario 2a plus South system imports from Loch Lomond for in-lieu recharge.	avg	63	26	86	51	86	82	96	53	49	55	54	93	75	0
		min	40	10	65	19	42	53	87							
		max	96	81	99	100	99	99	100							
	2c. Scenario 2b plus South system also imports North system unused diversions, and North system imports unused Felton system diversions.	avg	63	26	86	49	83	69	95	62	59	58	58	95	78	0
		min	40	10	65	18	40	27	85							
		max	96	81	99	100	99	99	100							
Scenario 3 – Import from Loch Lomond Plus Operate Olympia Aquifer Storage and Recovery	**3a.** Scenario 2b plus North system operates Olympia area ASR using North system unused diversions.	avg	61	25	86	42	86	82	95	66	64	58	59	95	78	0
		min	40	10	65	19	42	53	87							
		max	92	79	99	99	99	99	100							
	3b. Scenario 2b plus North system operates Olympia area ASR using Felton system unused diversions.	avg	63	26	86	51	84	67	95	68	66	58	59	96	79	0
		min	40	10	65	19	42	33	87							
		max	96	81	99	100	99	99	100							
	3c. Scenarios 3a and 3b combined.	avg	61	25	86	42	84	67	95	83	82	61	64	98	81	0
		min	40	10	65	19	42	33	87							
		max	92	79	99	99	99	99	100							
Scenario 4 – Valley In-Lieu Recharge	**4.** Scenario 3c plus SVWD imports North and Felton system remaining unused potential diversions.	avg	61	25	86	42	84	67	95	83	82	61	64	98	81	0
		min	40	10	65	19	42	33	87							
		max	92	79	99	99	99	99	100							

Ck creek
R river
SLR San Lorenzo River
avg average
min minimum
max maximum

[a] Calculated monthly as: 100 x {1 - [(diversions) ÷ (unimpaired flow)]}
[b] Calculated monthly as: 100 x [1 - [(diversions) ÷ (impaired flow + base case diversions)]. Only considers effects of SLVWD stream diversions.
[c] Calculated using method presented in Table 5-3. Only considers effects of SLVWD, SVWD, and MHA groundwater pumping.

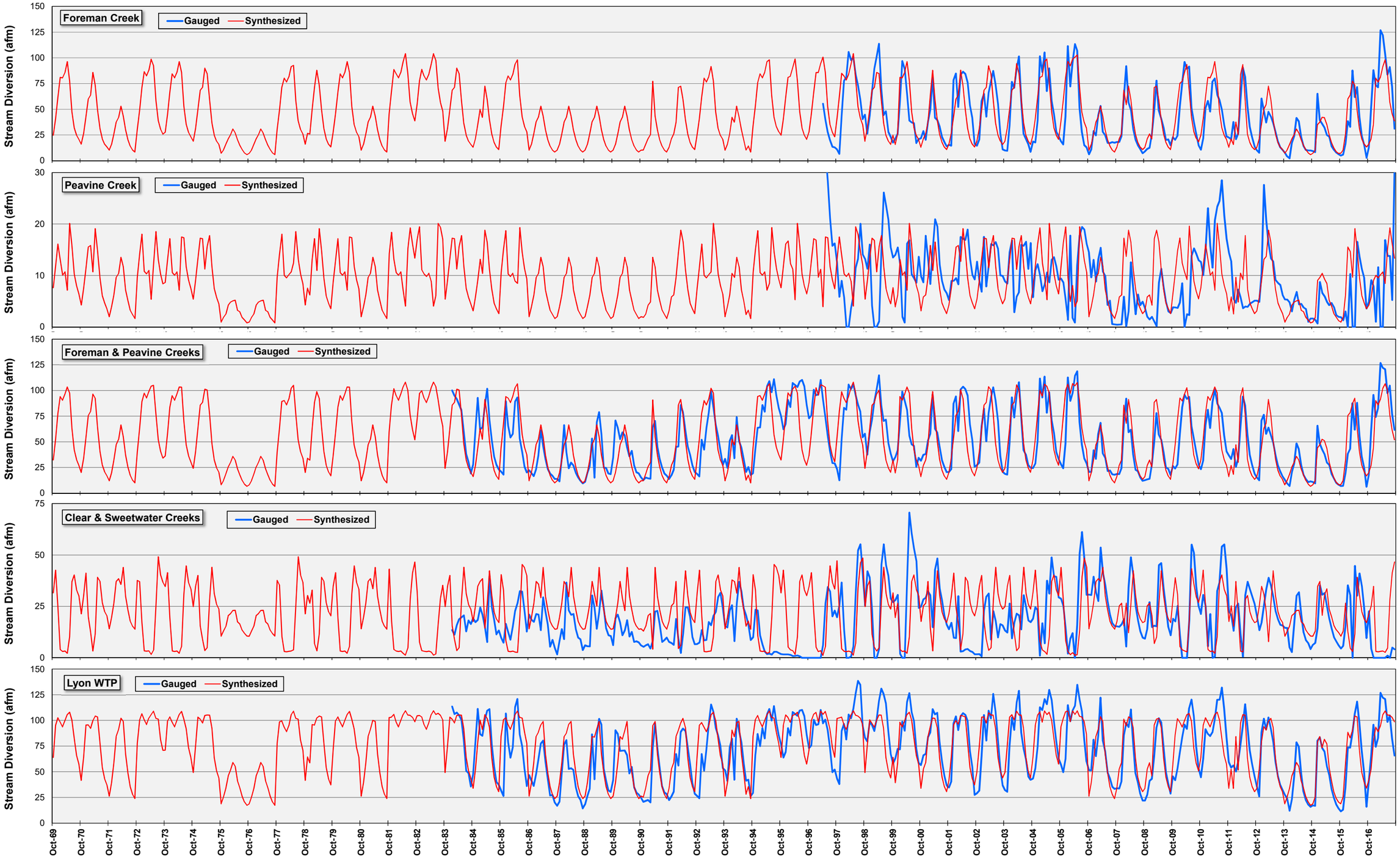
Table 6-11
Scenarios 2, 3, and 4 Simulated Percent of Downstream Flow Remaining



Note differences in vertical axis scaling.
See Table 1-1 for source of gauged records.

afm acre-feet per month

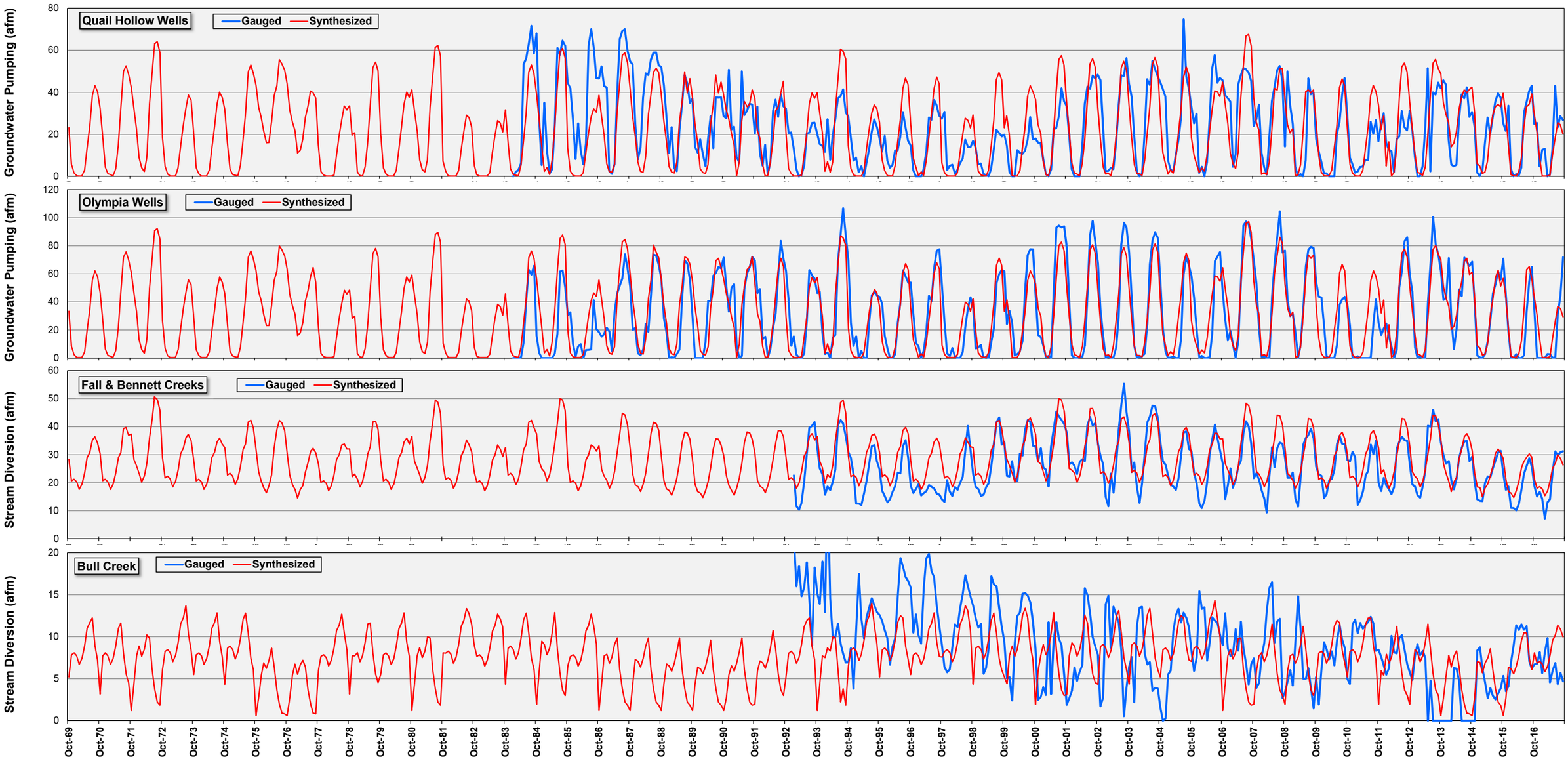
Figure 6-1
Base Case: Historical versus Simulated North, South, and Felton System Monthly Water Production Hydrographs Assuming WY 1970–2017 Climatic Cycle, Currently Permitted Infrastructure, and Projected 2045 Demand



Note differences in vertical axis scaling.
See Table 1-1 for source of gauged records.

afm acre-feet per month

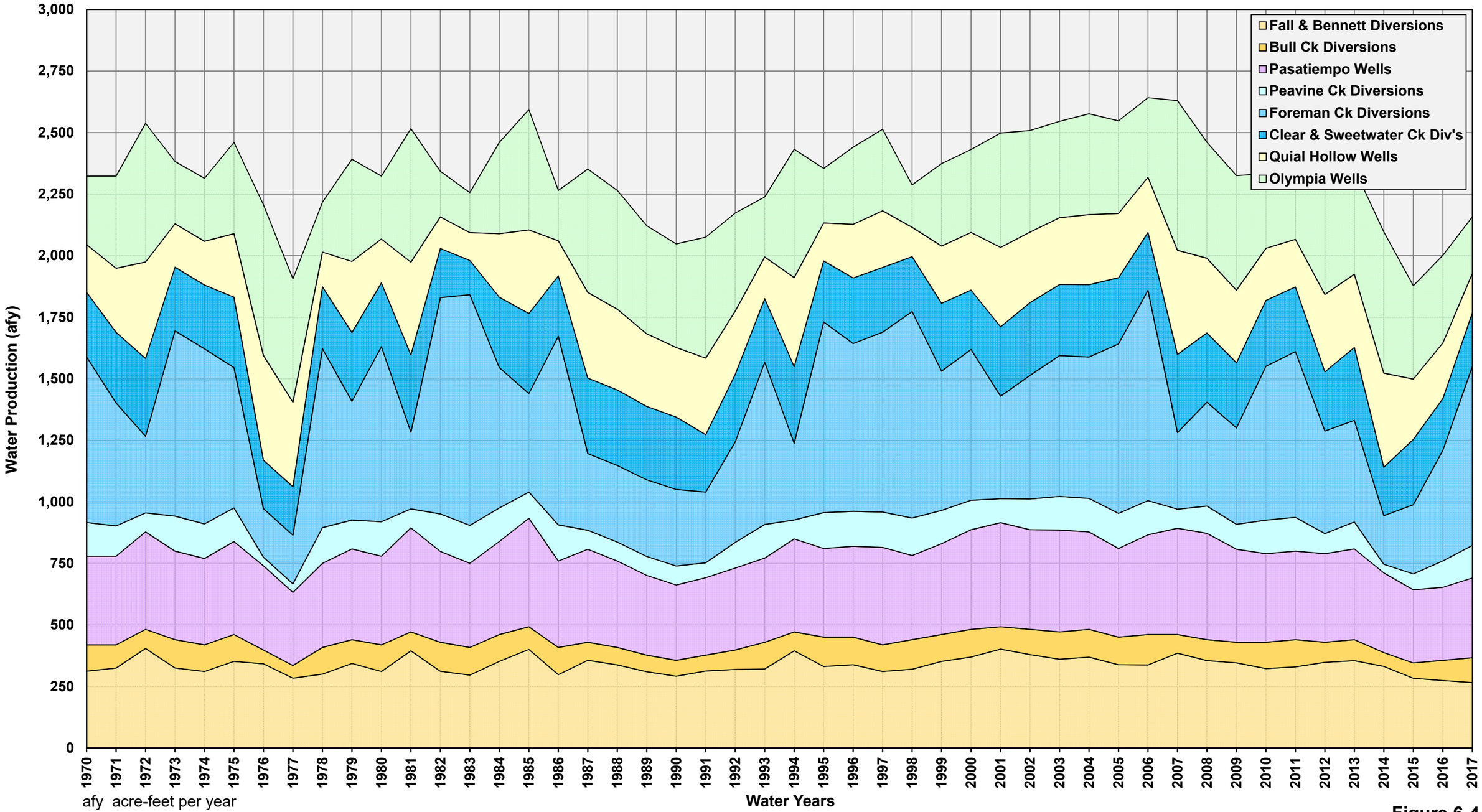
Figure 6-2
Base Case: Historical versus Simulated North System Monthly Surface Water Production Hydrographs Assuming WY 1970–2017 Climatic Cycle, Currently Permitted Infrastructure, and Projected 2045 Demand



Note differences in vertical axis scaling.
See Table 1-1 for source of gauged records.

afm acre-feet per month

Figure 6-3
Base Case: Historical versus Simulated Monthly North System Groundwater and Felton System Surface Water Production Hydrographs Assuming WY 1970–2017 Climatic Cycle, Currently Permitted Infrastructure, and Projected 2045 Demand



afy acre-feet per year

Source: Table 6-4; annual values derived from simulated monthly record.

Figure 6-4
Base Case: Simulated SLVWD Annual Production Assuming WY 1970–2017 Climatic Cycle, Currently Permitted Infrastructure, and Projected 2045 Demand

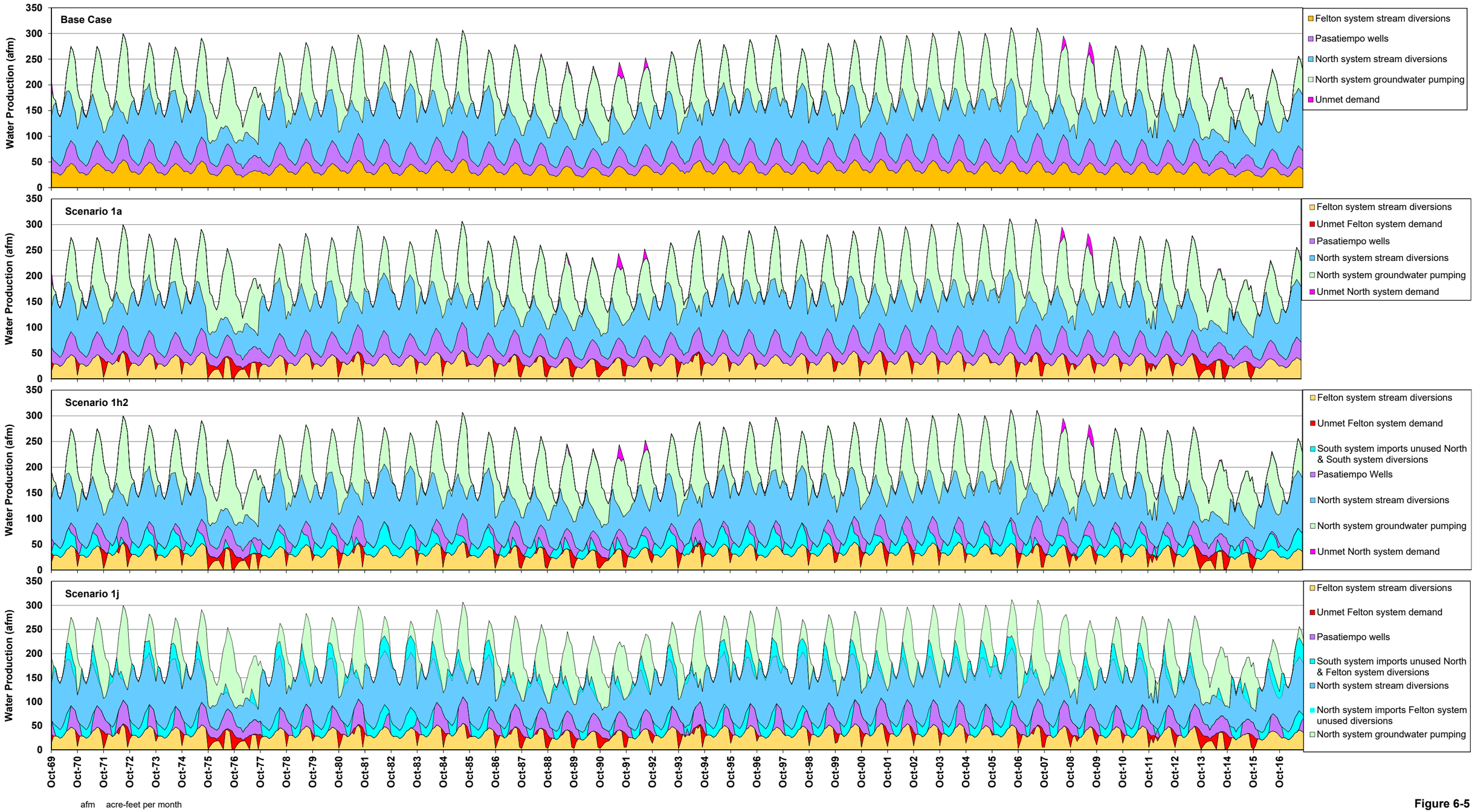
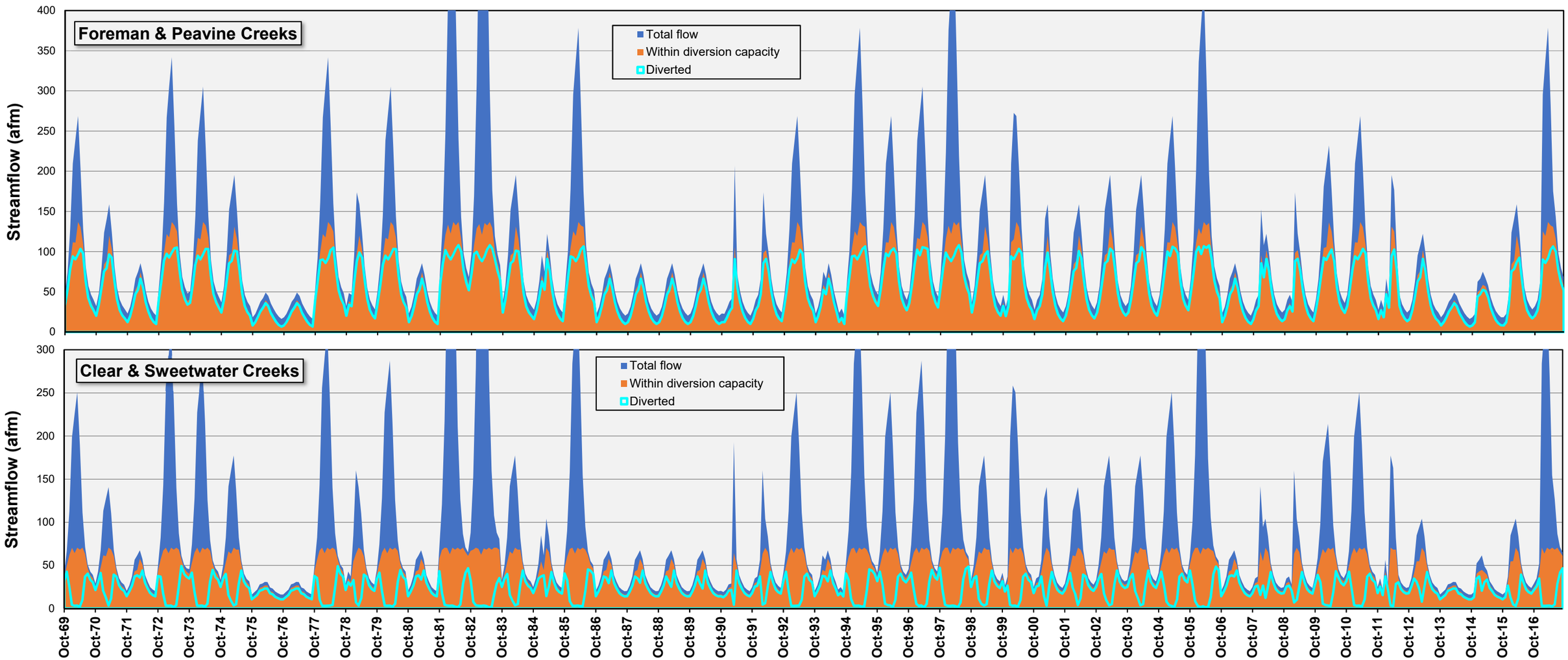


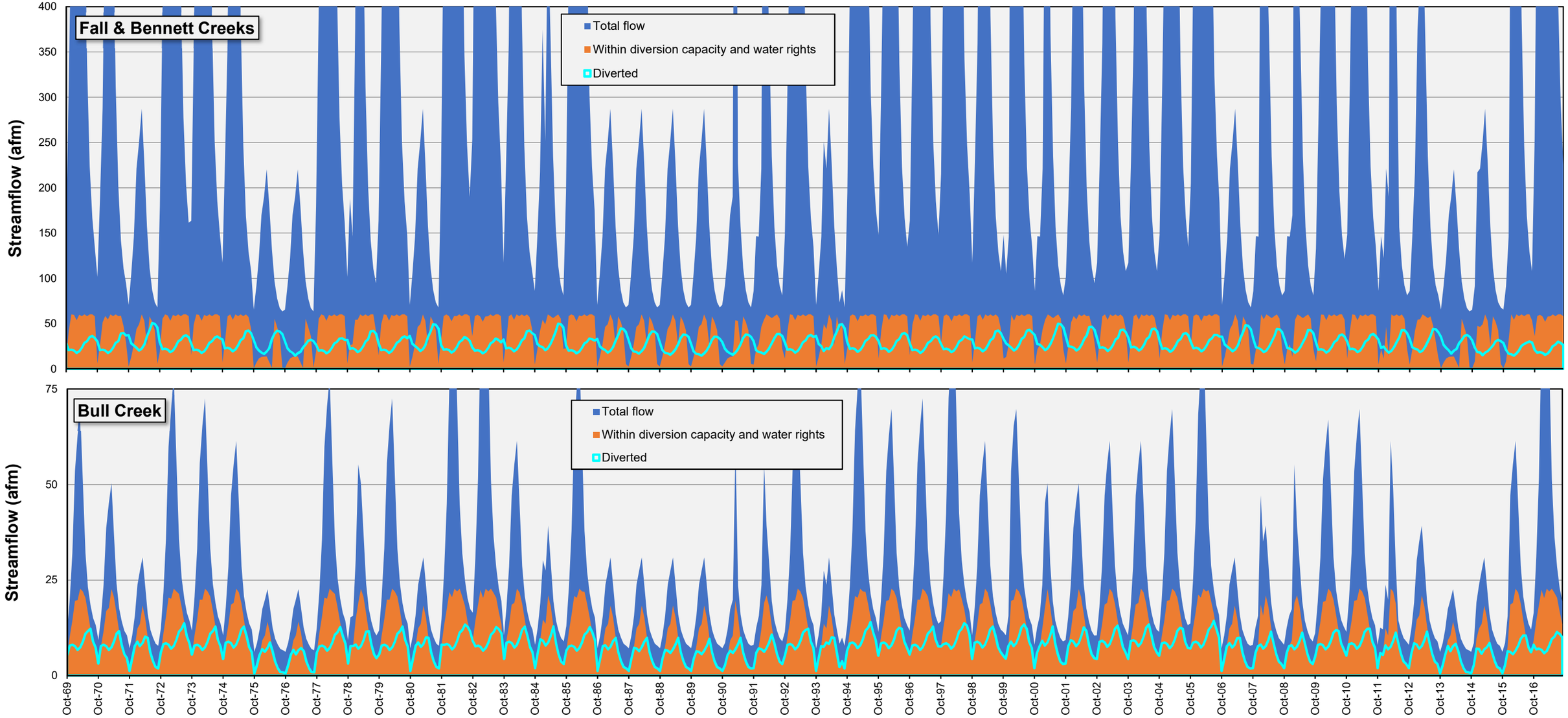
Figure 6-5
Monthly Results for Base Case and Scenarios 1a, 1h2, and 1j, WYs 1970–2017



Note differences in vertical axis scaling. afm acre-feet per month

Figure 6-6

Base Case: Hydrographs of North System Simulated Streamflow and Diversions Assuming WY 1970–2017 Climatic Cycle, Currently Permitted Infrastructure, and Projected 2045 Demand



Note differences in vertical axis scaling. afm acre-feet per month

Figure 6-7

Base Case: Hydrographs of Felton System Simulated Streamflow and Diversions Assuming WY 1970–2017 Climatic Cycle, Current Infrastructure and Usage, and Projected 2045 Demand

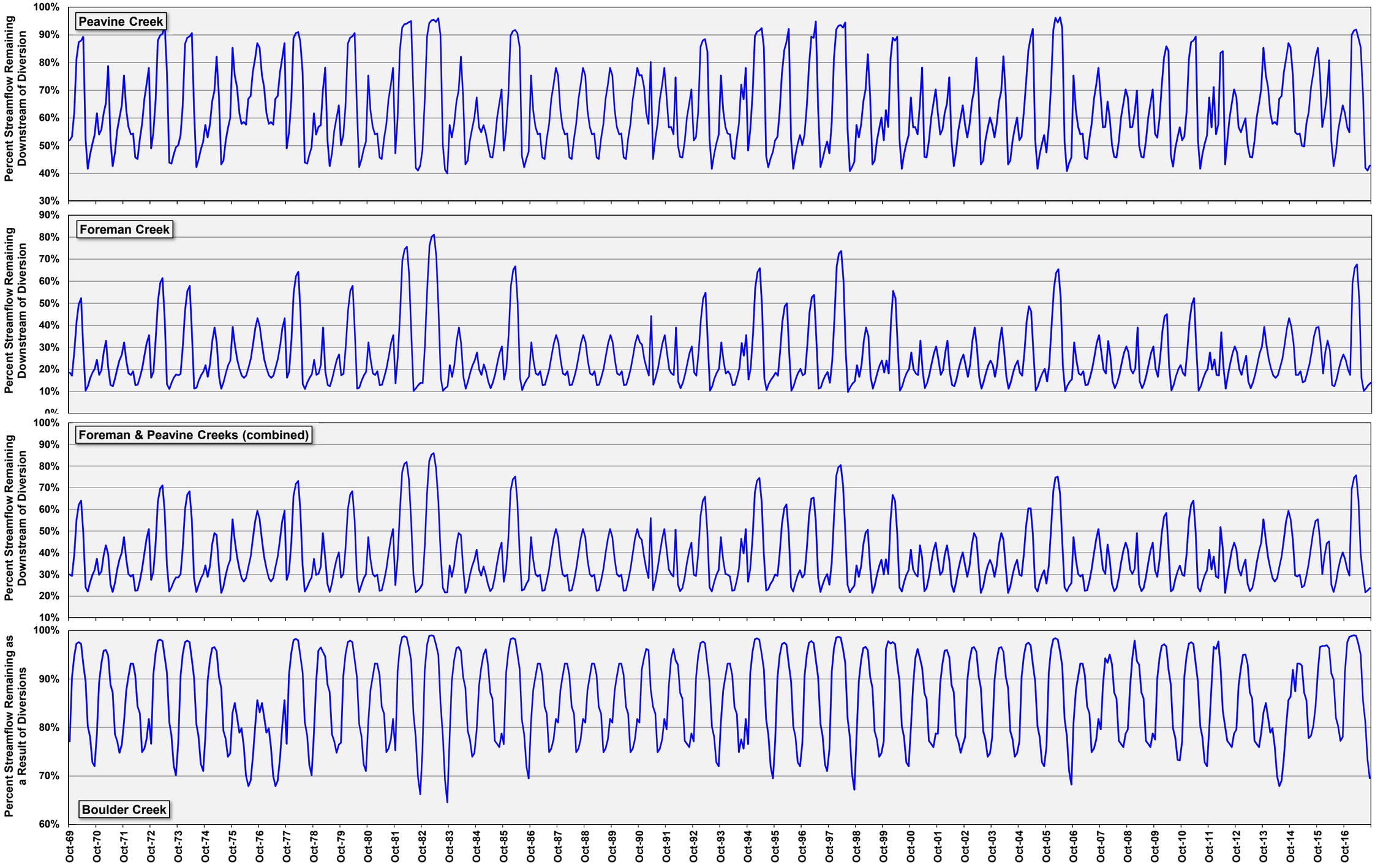
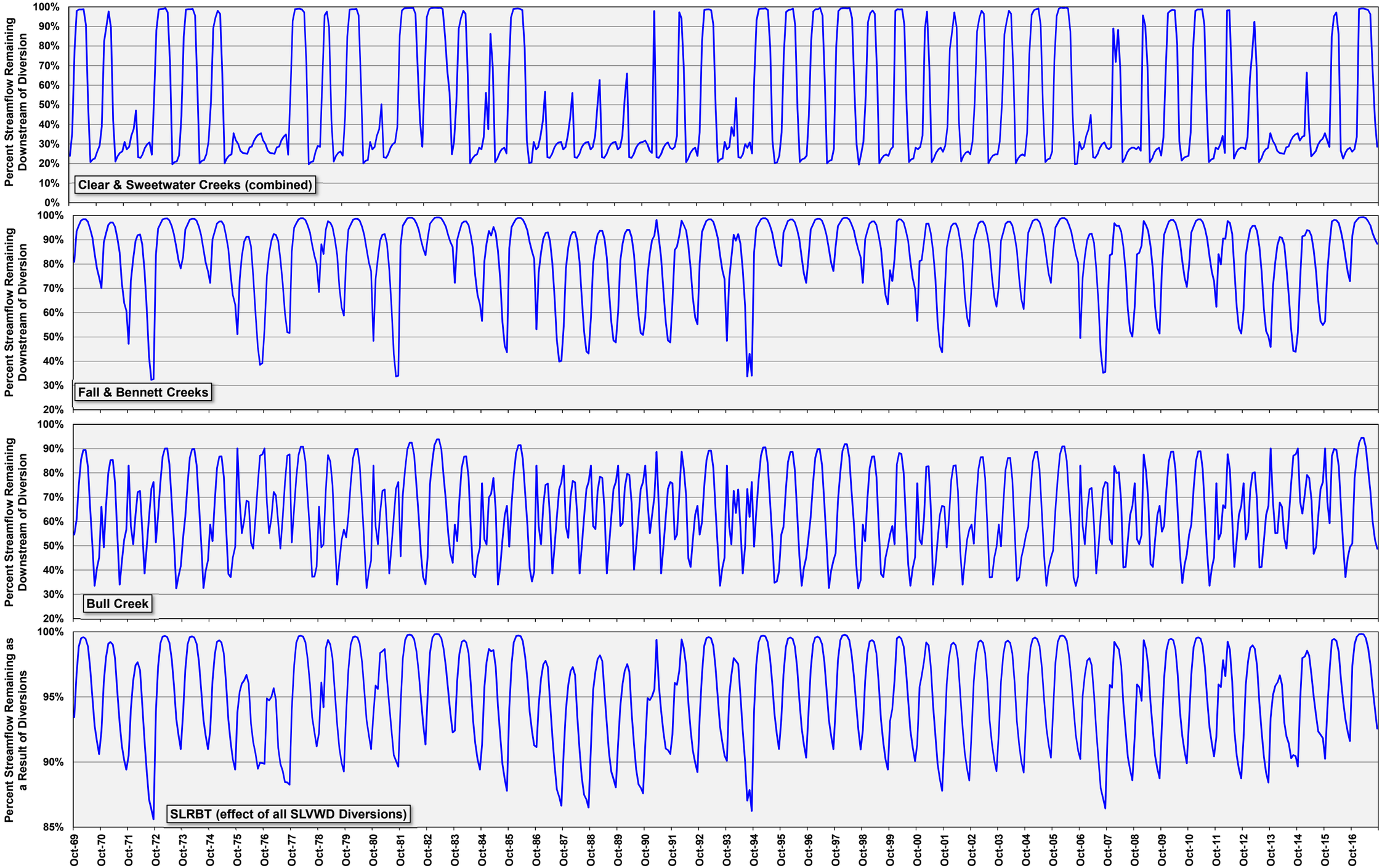


Figure 6-8

Note differences in vertical axis scaling.

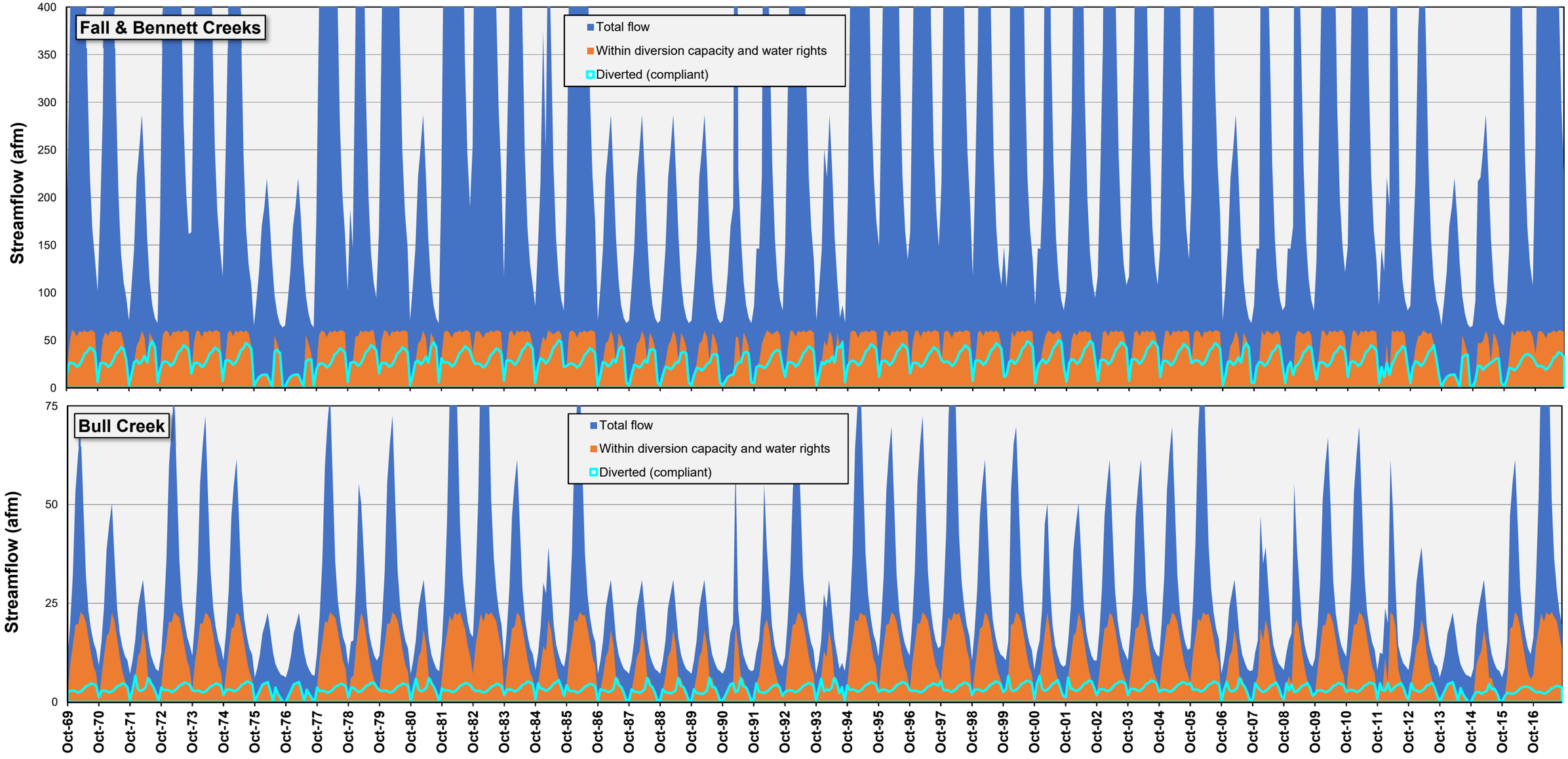
Base Case: Percent of Simulated Monthly Flow Remaining Downstream of North System Foreman and Peavine Creek Diversions Assuming WY 1970–2017 Climatic Cycle, Currently Permitted Infrastructure, and Projected 2045 Demand



Note differences in vertical axis scaling.

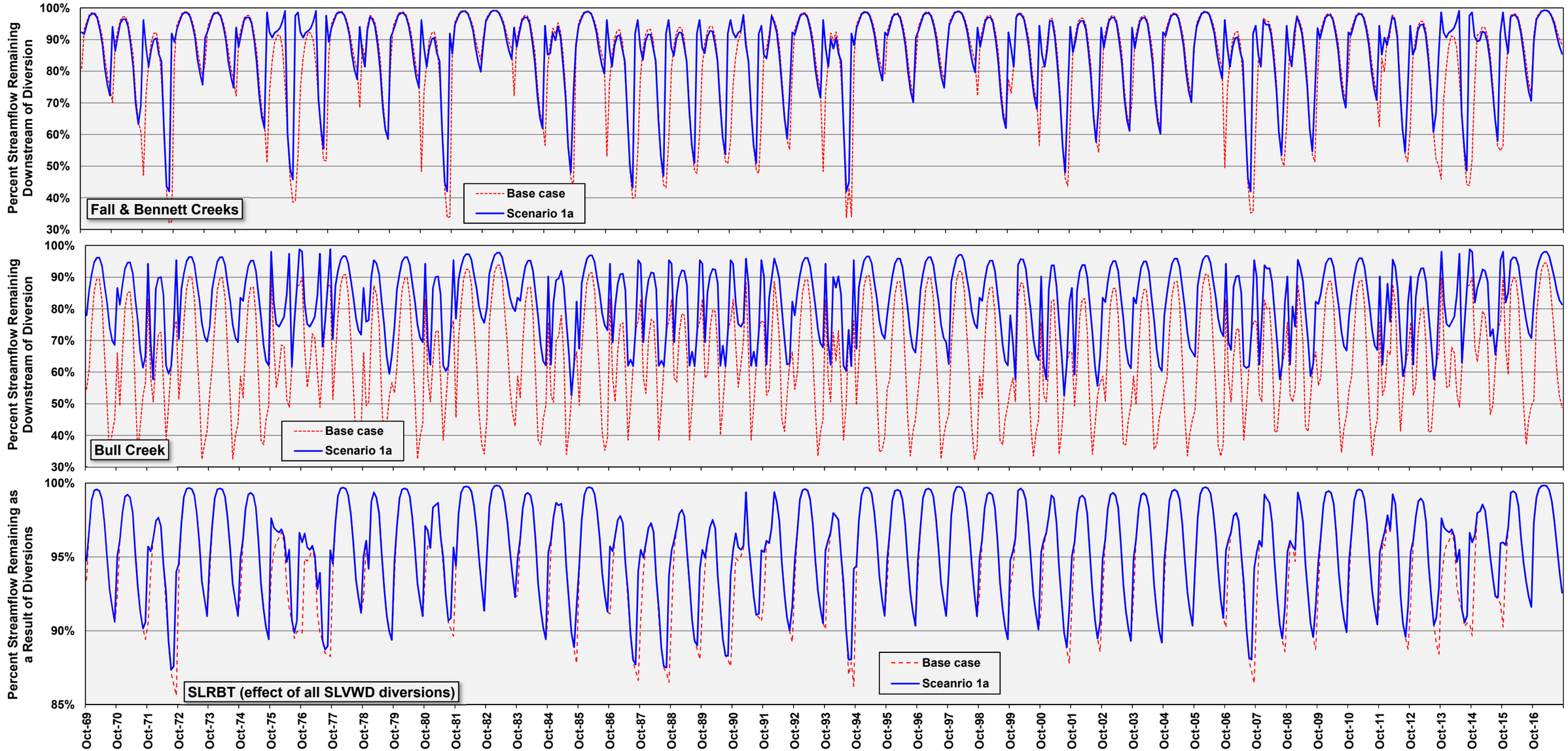
Figure 6-9

Base Case: Percent of Simulated Monthly Flow Remaining Downstream of North System Clear and Sweetwater Creek and Felton System Fall, Bennett, and Bull Creek Diversions Assuming WY 1970–2017 Climatic Cycle, Current Infrastructure and Usage, and Projected 2045 Demand



Note differences in vertical axis scaling. afm acre-feet per month

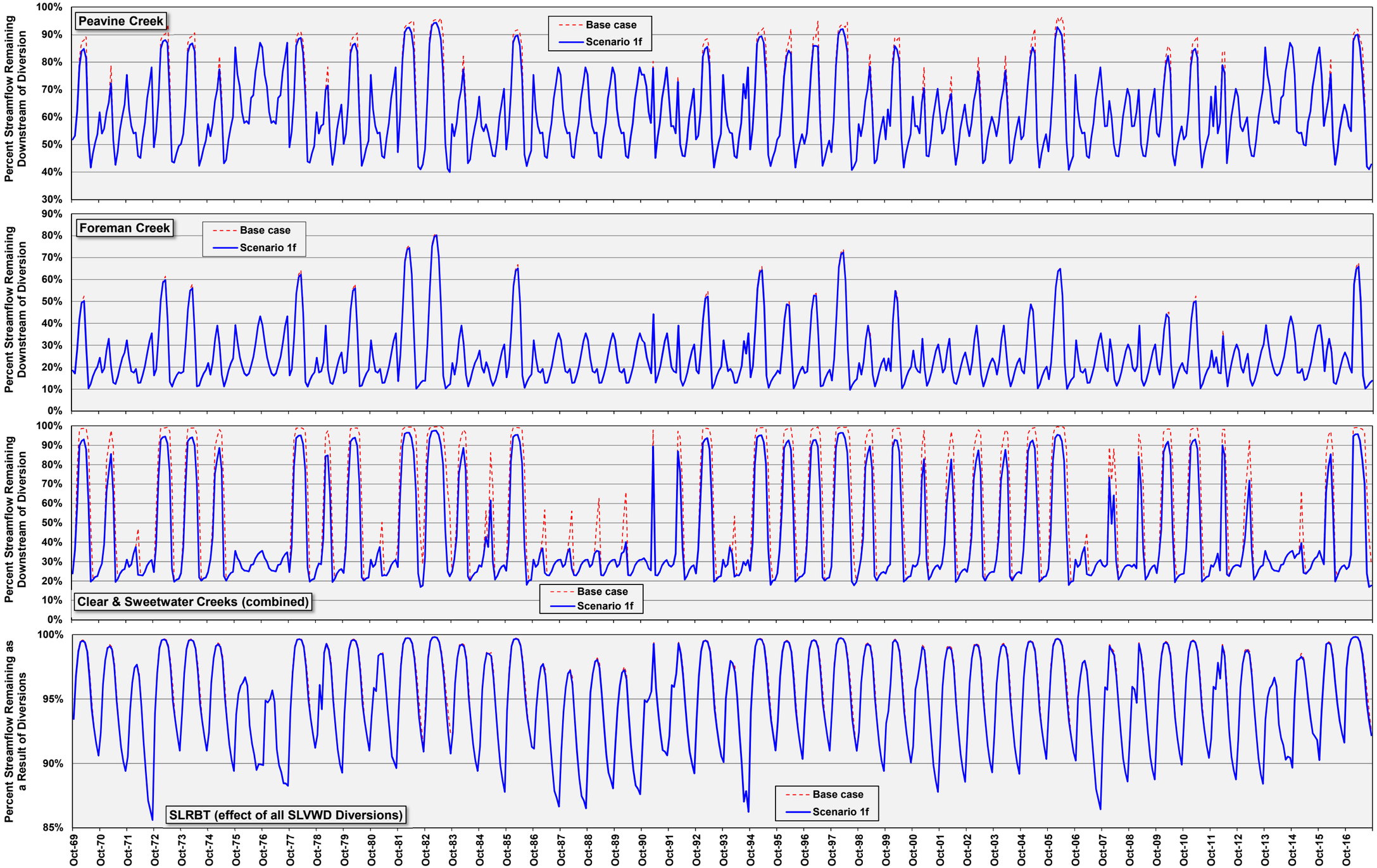
Figure 6-10
Scenario 1a: Hydrographs of Felton System Simulated Streamflow and Diversions Assuming WY 1970–2017 Climatic Cycle, Current Infrastructure, Permitted Use, and Projected 2045 Demand



Note differences in vertical axis scaling.

Figure 6-11

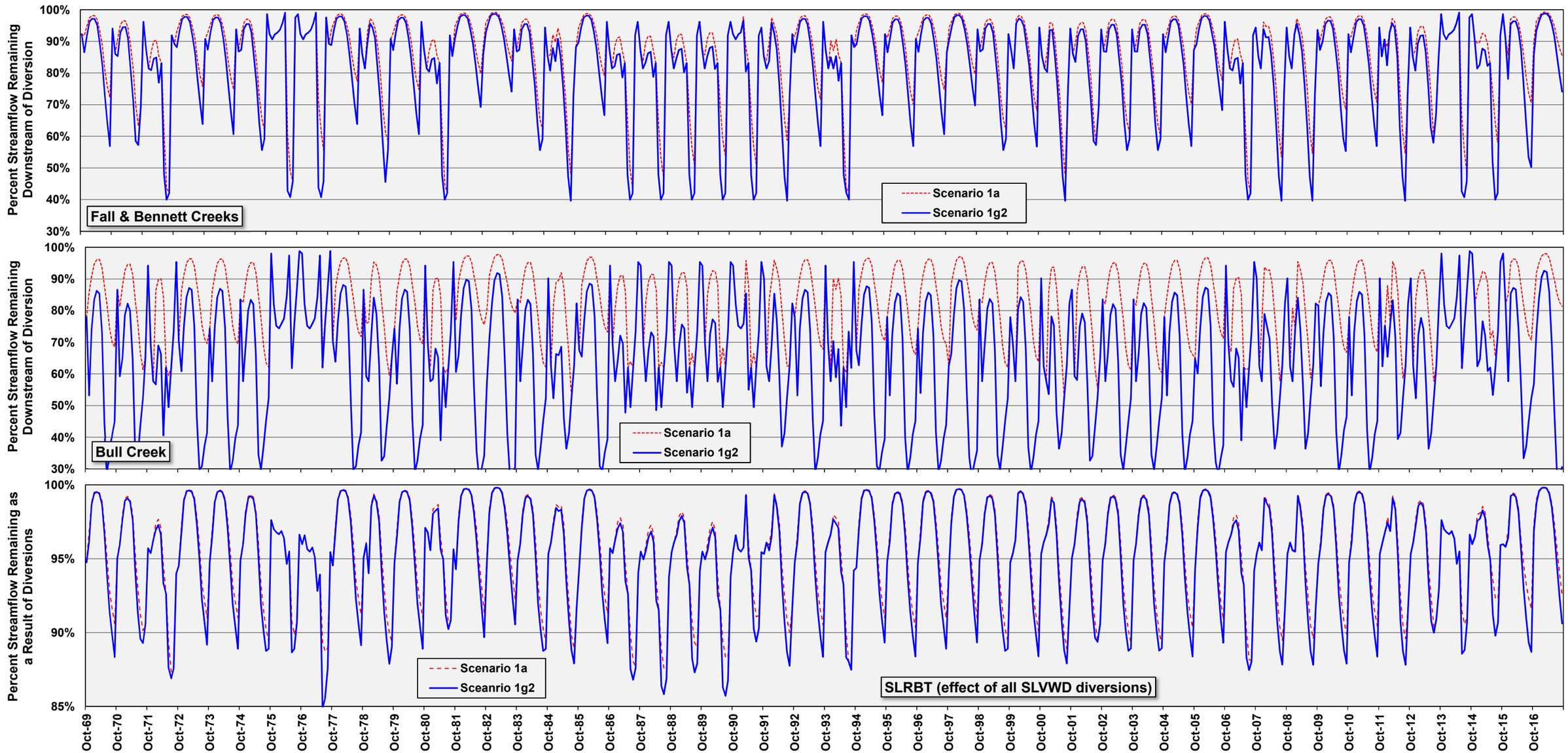
Scenario 1a: Percent of Simulated Monthly Flow Remaining Downstream of Felton System Fall, Bennett, and Bull Creek Diversions Assuming WY 1970–2017 Climatic Cycle, Current Infrastructure, Permitted Use, and Projected 2045 Demand



Note differences in vertical axis scaling.

Figure 6-12

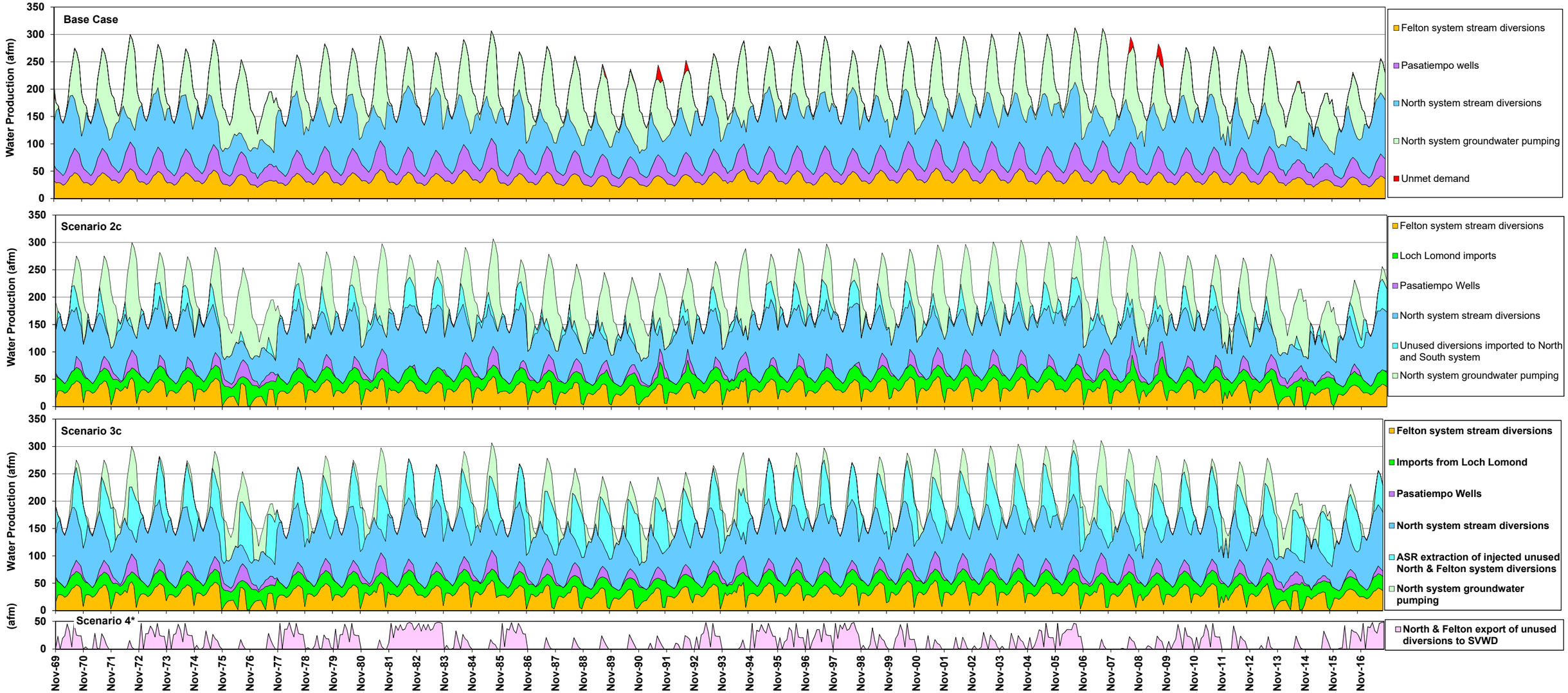
Scenario 1f: Percent of Simulated Monthly Flow Remaining Downstream of North System Diversions Assuming South System Import of Unused North System Potential Diversions and Felton Diversions as Permitted



Note differences in vertical axis scaling.

Figure 6-13

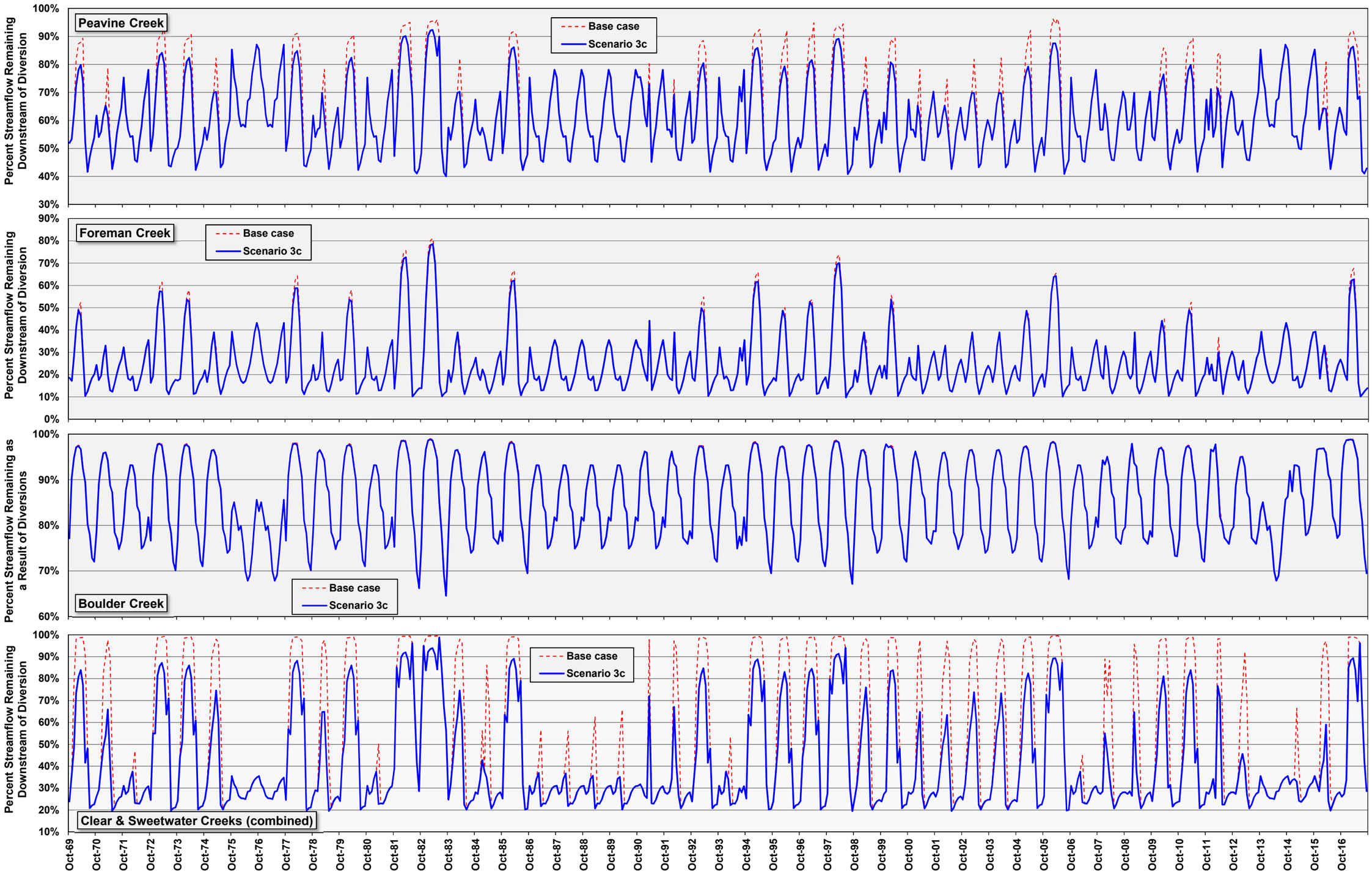
Scenario 1g2: Percent of Simulated Monthly Flow Remaining Downstream of Felton System Diversions Assuming South System Import of Unused Permitted Felton System Diversions



*Scenario 4 same as 3c except for export to SVWD.

afm acre-feet per month

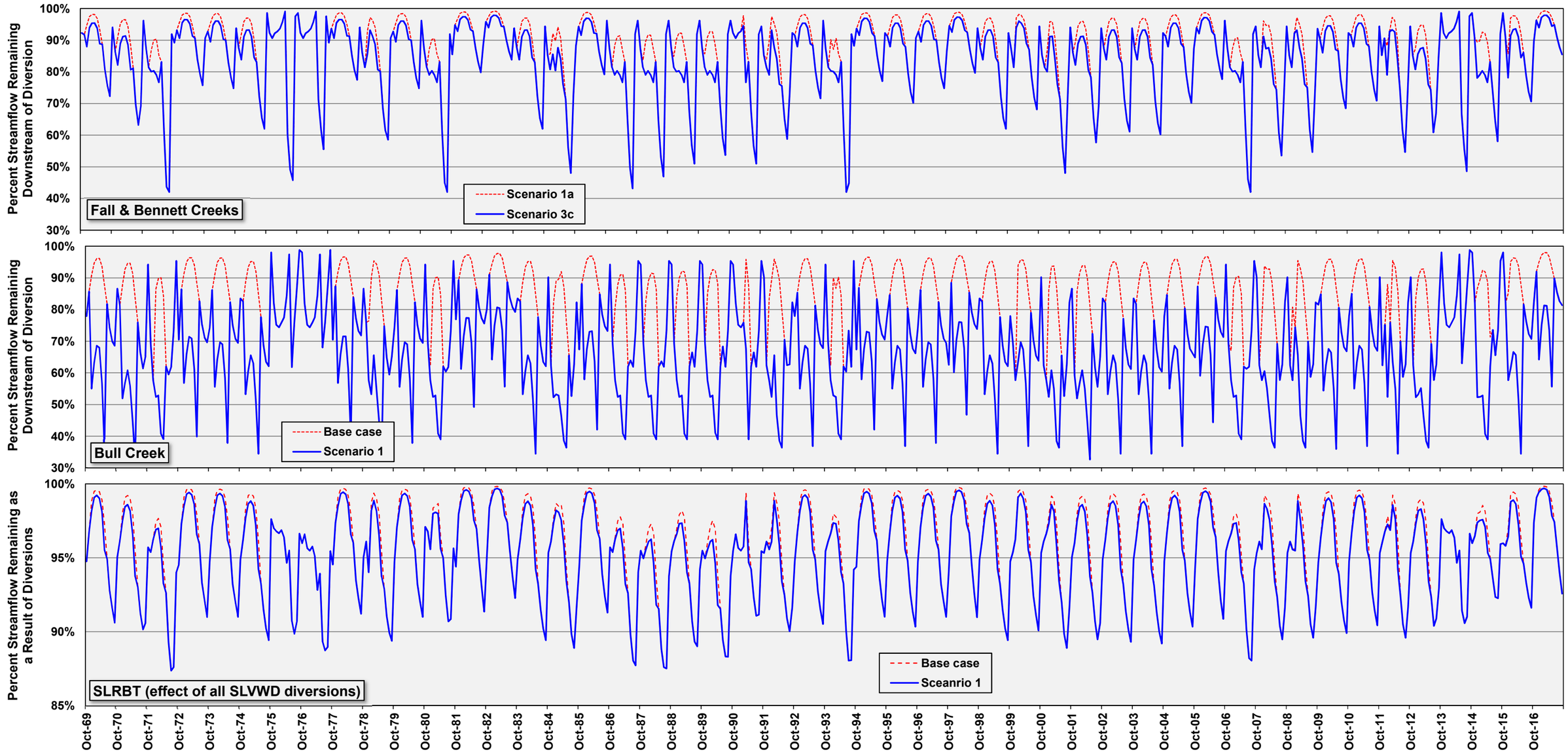
Figure 6-14
Monthly Results for Base Case and Scenarios 2c, 3c, and 4, WYs 1970–2017



Note differences in vertical axis scaling.

Figure 6-15

Scenario 3c: Percent of Simulated Monthly Flow Remaining Downstream of North System Diversions



Note differences in vertical axis scaling.

Figure 6-16

Scenario 3c: Percent of Simulated Monthly Flow Remaining Downstream of Felton System Diversions

7 Summary and Conclusions

On the basis of reasonably good calibration to the historical record (Section 6.2), the procedure described in Section 6.1 is used to simulate a base case and 22 conjunctive use alternatives documented in Section 6. As intended, the results are suitable for a planning-level evaluation of conjunctive use alternatives, i.e., to help qualify fundamental differences between alternatives. These scenarios are simulated under optimal, hypothetical conditions without full regard for infrastructure and other operational limitations, and as such likely overestimate potential yields. The actual yield of modified infrastructure will depend on numerous factors beyond the scope of this analysis. The presented values of simulated monthly flow have limited precision and should not be used to evaluate compliance with specific regulatory, water-right, or habitat requirements. Evaluating the effects of groundwater pumping on streamflow, beyond the simple approach used for this study, requires use of a calibrated numerical groundwater flow model, which was not within the scope of this study.

Figure 7-1 provides a summary of the base case and alternative conjunctive use scenarios evaluated in Section 6. The upper three stacked-bar charts represent simulated average annual North, Felton, and South system water production, indicated by source, for WYs 1970–2017. These plots also indicate percent reductions in groundwater pumping and compliance with Felton system water rights. The bottom bar chart indicates average annual amounts of unused stream diversions and Loch Lomond allotment for each scenario.

The bar charts presented in Figure 7-2 compare the minimum percentage of monthly streamflow simulated to remain downstream of SLVWD's diversions for each scenario during the simulation period. The bar charts in Figure 7-3 compare the minimum percentage of estimated drought stream baseflow remaining as a result of the groundwater pumping assumed by each scenario.

The simulation results summarized in Figure 7-1 support the following observations:

- Potential water transfers using the system interties are insufficient to achieve Felton water rights compliance (Scenario 1a). The North system has no unused potential diversions during months when the Felton system is not in compliance. Increased production from the Pasatiempo wells for transfer to Felton would require locally unprecedented rates of production from an over-drafted aquifer. A supplemental source, such as imports from Loch Lomond (Scenario 2), may be needed as much as 23 percent of the time to comply with Felton system water rights.
- Estimated increases in water production with assumed increases in diversion capacity (Scenarios 1c, 1d, 1e) are highly approximate but indicate the potential for increased yields with increased diversion, conveyance, and treatment capacities.
- South system imports of North and/or Felton system unused potential diversions allows 30 to greater than 50 percent reductions in South system groundwater pumping (e.g., Scenario 1h2).
- Supplementing the North system's water supply with Felton system unused potential diversions provides a 20 percent overall reduction in North system groundwater pumping (e.g., Scenario 1i).
- Supplementing the North system with extractions from an ASR project supplied by North and/or Felton unused potential diversions hypothetically allows roughly 30 to 60 percent net reductions in overall North system groundwater pumping (Scenario 3).
- Use of SLVWD's Loch Lomond allotment allows the Felton system to comply with its permitted water rights as well as reduce South system groundwater pumping by roughly 60 to 70 percent; as a result, unused potential diversions from the North and Felton systems are available for ASR instead of being used for South system in-lieu recharge (e.g., Scenario 3c).
- A 60 to 70 percent reduction in South system groundwater pumping as a result of imports from Loch Lomond and/or unused potential diversions

represents a significant contribution to SMGB groundwater storage recovery. The degree to which SLVWD could recover this storage is uncertain.

- Using the system interties to supply the South system with unused potential diversions uses roughly 40 and 50 percent of North and Felton system unused diversions, respectively.
- With the addition of a Loch Lomond supply, use of North and Felton unused potential diversions requires ASR. As simulated under optimal conditions, ASR uses roughly half of the remaining unused diversions and helps reduce North system groundwater pumping by roughly 30 to 60 percent (Scenario 3).
- The remaining North and Felton system potential unused diversions (i.e., exceeding the capacity of the hypothesized ASR project) are assumed available for export to SVWD (Scenario 4), averaging more than 150 afy and ranging up to 500 afy assuming a conveyance capacity of 350 gpm, which further contributes to the recovery of SMGB groundwater storage. The degree to which this increased storage benefits production from the SLVWD Pasatiempo wells is uncertain but likely limited.

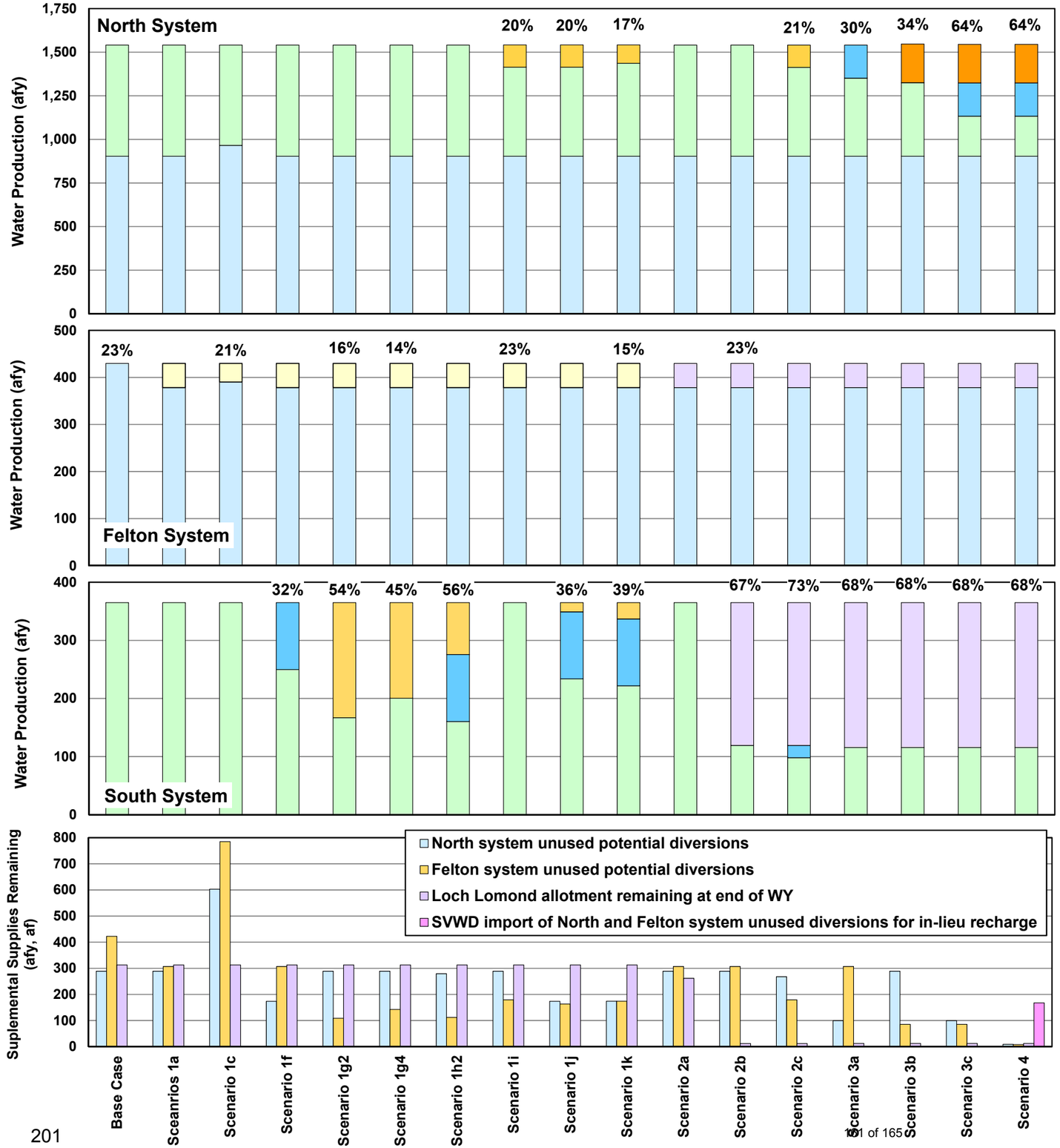
The simulation results summarized in Figures 7-2 and 7-3 support the following observations:

- Complying with the Felton system water rights (Scenario 1a) notably increases the minimum percentages of flows remaining downstream of diversions, particularly for Bull Creek (see also Figure 6-11).
- Stream diversions for in-lieu recharge and ASR occur during high-flow periods and have relatively little effect on minimum flows remaining downstream of the diversions (e.g., see also Figures 6-12 and 6-13).
- Reduced groundwater pumping as a result of imports from Loch Lomond and the transfer of unused diversions increases the percentage of drought minimum baseflows estimated to remain in lower Newell, Zayante, and Bean

creeks to 60 to 80 percent, compared to roughly 50 percent or less for the base case (Tables 5-3, 6-6, and 6-11).

In summary, system interties combined with supplemental water supplies from Loch Lomond and/or an ASR project provide SLVWD with significant options and flexibility for increasing conjunctive use and improving stream baseflows. The results provide qualitative indications of the potential relative magnitude and effects of the various alternatives considered. Further application of this work is expected to occur in the context of in-stream flow objectives recommended by fishery biologists.

Given an apparent range of potentially successful options for increasing conjunctive use, alternatives selection may be expected to depend largely on cost, feasibility, and the recommendations of fishery biologists. For example, importing from Loch Lomond may be significantly easier, less costly, and more predictable to operate than an ASR project. Operational experience from implementing a relatively feasible alternative will guide the potential adoption of additional conjunctive use measures. Logistical, water rights, and environmental considerations, combined with the highly approximate nature of the alternative conjunctive use simulations presented in this assessment, limit the basis for formulating recommendations based on the simulation results alone.



- Stream diversions (for North system direct use)
- Groundwater pumping (of native recharge)
- Import of unused Felton system diversions for in-lieu recharge
- ASR extraction of recharged North system unused stream diversions
- ASR extraction of recharged Felton system unused stream diversions

10% Average annual percent reduction in groundwater pumping as a result of in-lieu recharge and/or ASR operation (zero if not indicated).

Shows only Scenario 1 alternatives for which Felton system complies with water rights (as listed below).

- Stream diversions (for Felton system use)
- Import from Loch Lomond for base case unmet demand
- Demand unmet without exceeding water rights

10% Percent of months Felton non-compliant (zero if not indicated).

Source: Tables 6-4 through 6-10.

10% Average annual percent reduction in groundwater pumping as a result of in-lieu recharge and/or ASR operation (zero if not indicated).

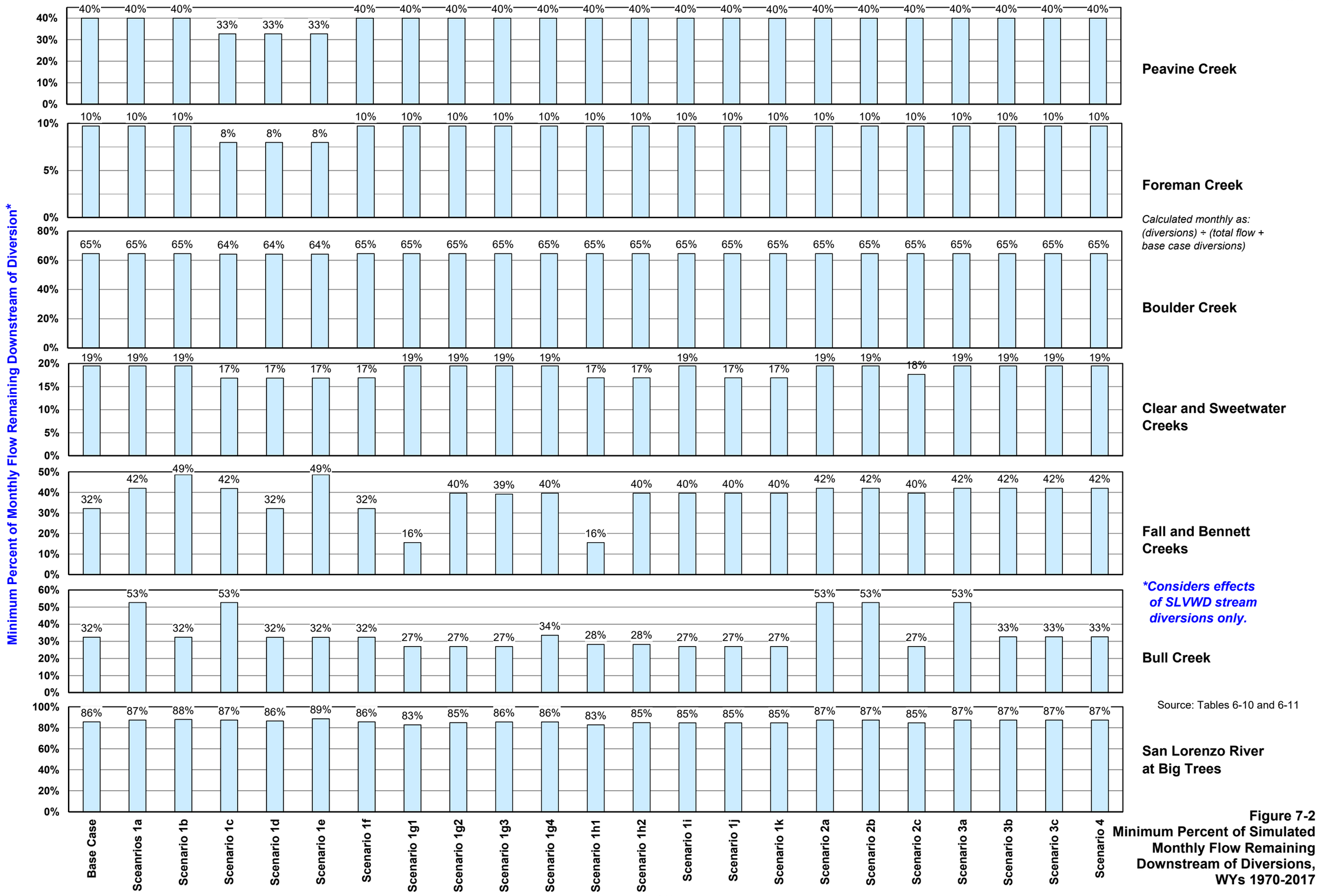
- Groundwater pumping
- Import of unused North system diversions for in-lieu recharge
- Import of unused Felton system diversions for in-lieu recharge
- Import from Loch Lomond

Base case Simulated historical record (calibrated to WYs 2000-2017)

Scenario

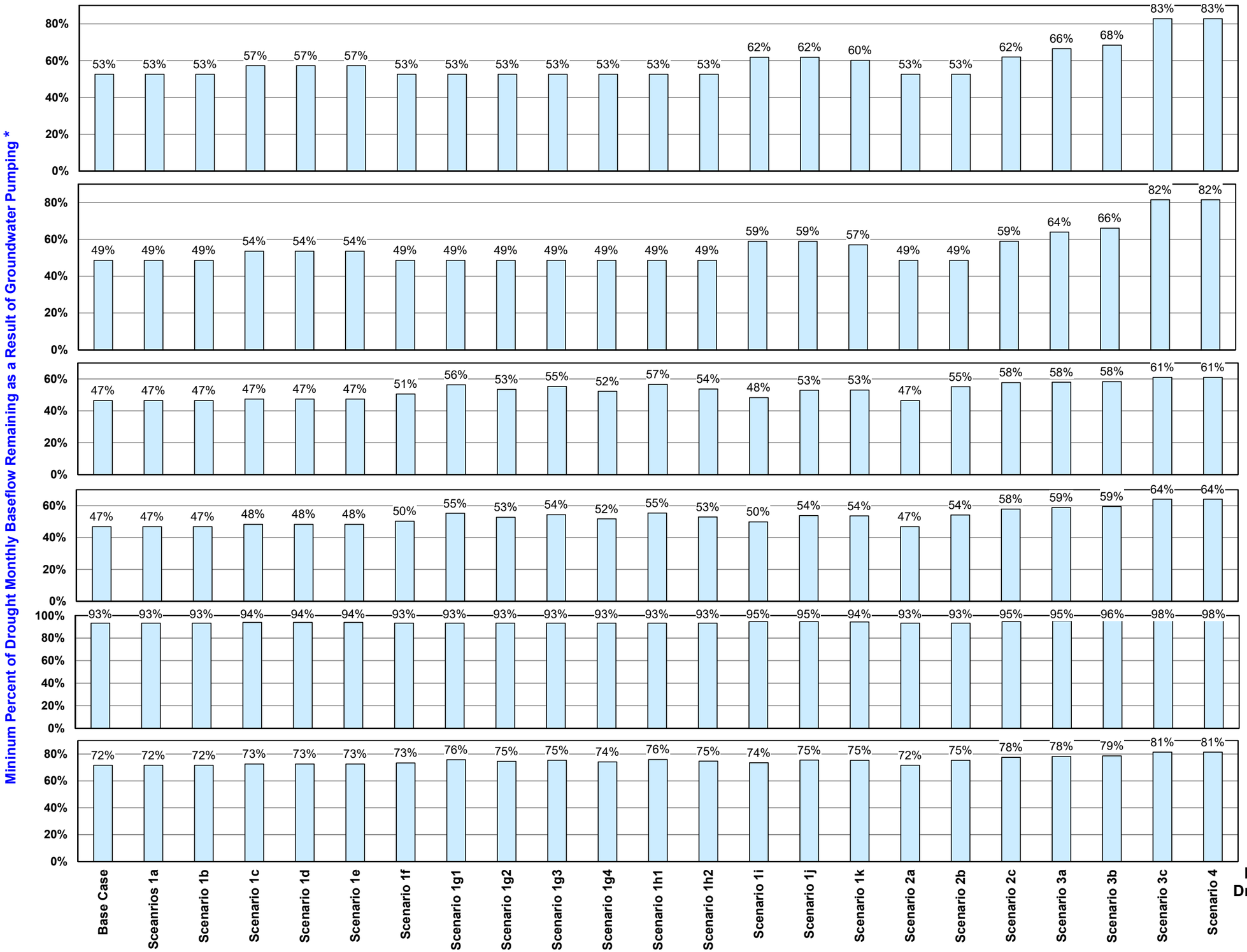
1a. Felton system complies with water rights.
1c. All diversion capacities doubled.
1f. South system imports North system unused potential diversions for in-lieu recharge.
1g2. South system imports Felton system unused potential diversions for in-lieu recharge.
1g4. Scenario 1g2 except intertie capacities limited.
1h2. South system imports unused potential diversion from North and Felton systems.
1i. North system imports Felton system unused potential diversions for in-lieu recharge.
1j. Scenario 1i plus South system imports unused potential diversion from North and Felton systems.
1k. Scenario 1j except intertie capacities limited.
2a. North and Felton systems import from Loch Lomond to satisfy unmet demand in Scenario 1a.
2b. Scenario 2a plus South system imports from Loch Lomond for in-lieu recharge.
2c. Scenario 2b plus South imports North unused diversions, and North imports Felton unused diversions.
3a. Scenario 2b plus North system operates Olympia area ASR using North system unused diversions.
3b. Scenario 2b plus North system operates Olympia area ASR using Felton system unused diversions.
3c. Scenarios 3a and 3b combined.
4. Scenario 3c plus SVWD imports North and Felton system remaining unused potential diversions.

Figure 7-1
Summary of Base Case and Alternative Conjunctive Use Scenarios, Simulated Annual Averages, WYs 1970–2017



Source: Tables 6-10 and 6-11

Figure 7-2
Minimum Percent of Simulated Monthly Flow Remaining Downstream of Diversions, WYs 1970-2017



Calculated using method presented in Table 5-3.

Considers effects of SLVWD, SVWD, and MHA groundwater pumping only.

Source: Tables 6-10 and 6-11.
Minimum drought baseflows defined in Table 5-3.

Figure 7-3
Minimum Percent of Estimated Drought Baseflow Remaining as a Result of Groundwater Pumping Assumed for Each Scenario, WYs 1970–2017

8 References

Balance Hydrologics. 2015. Baseline Report of Streamflow, Temperature and Related Observations for the SLVWD's Surface Sources of Community Water Supply. Prepared for San Lorenzo Valley Water District. June.

Balance Hydrologics. 2016. Streamflow, Temperature, and Related Observations for the SLVWD's Surface Sources of Community Water Supply: Year 2, WY2015. Prepared for San Lorenzo Valley Water District.

Balance Hydrologics. 2018. Streamflow, Temperature, and Related Observations for the SLVWD's Surface Sources of Community Water Supply: Years 3 and 4, WYs 2016–2017. Prepared for San Lorenzo Valley Water District.

Bassett, R. 2018. City of Santa Cruz Water Department, email communication. April 30, 2018.

Geomatrix Consultants. 1999. Estimated Discharge of Surface Water Sources. Prepared for San Lorenzo Valley Water District. March.

HEA. 1983. Estimation of Monthly Flow Records of Selected Ungauged Streams for the Period 1921–82, Task Report B-2, North-Central Santa Cruz County Water Supply Master Plan Study. Prepared for North-Central Santa Cruz County Water Policy Planning Task Force. Prepared by HEA, a division of J.H. Kleinfelder & Associates. July.

HEA. 1984. Comparison of Diversion and Reservoir Yields from Estimated Total, Available, and Actually Divertible Flows of Selected Streams, North Central Santa Cruz County Water Supply Master Plan Study, Subtask Report B-7 supplement. Prepared for North Central Santa Cruz County Water Policy Planning Task Force. Prepared by HEA, a division of J.H. Kleinfelder & Associates. August.

Johnson, N.M. 2016. Potential Use of Felton-South System Intertie. Technical memorandum prepared for San Lorenzo Valley Water District. Prepared by MWH. March.

Johnson, N.M. 2009. SLVWD Water Supply Master Plan. Prepared for San Lorenzo Valley Water District. Prepared by N.M. Johnson, Water Resources Consultant. May.

Johnson, N.M. 2015. SLVWD 2010 Urban Water Management Plan. Prepared for San Lorenzo Valley Water District. Prepared by N.M. Johnson, Water Resources Consultant. August.

Kennedy/Jenks. 2016. 2015 Urban Water Management Plan. Prepared for Scotts Valley Water District. Prepared by Kennedy/Jenks Consultants. June.

Kocher, B. 1996. Draft memorandum of Agreement Between City of Santa Cruz and the SLVWD Setting Forth the Conditions by which the City of Santa Cruz Would Deliver Treated Water to the San Lorenzo Valley Water District. Transmittal letter with attachment to J. Mueller/San Lorenzo Valley Water District. Santa Cruz City Water Department. May.

Ruttenberg, D. 2018. Balance Hydrologics, email communication. June 13, 2018.

SPH Associates. 2010. Loch Lomond Reservoir Source Development Study. Report prepared for San Lorenzo Valley Water District. Prepared by SPH Associates Consulting Engineers. October.

WSC. 2016. 2015 Urban Water Management Plan. Prepared for the San Lorenzo Valley Water District. Prepared by Water Systems Consulting. December.

M E M O

To: Board of Directors

From: District Manager

Subject: NOTIFICATION OF NOMINATIONS – 2019 ELECTION
SDRMA BOARD OF DIRECTORS

Date: February 21, 2019

RECOMMENDATION:

It is recommended that the Board of Directors review this memo and attached information from Special Districts Risk Management Authority (SDRMA) for nominations to SDRMA Board of Directors.

BACKGROUND:

SDRMA is soliciting nominations to fill 3 director seats on the SDRMA Board. Nomination documents, information and nominee qualifications are attached. Directors are elected to a 4 year term beginning January 1, 2020. Nomination documents must be received in SDRMA's office no later than 4:30 p.m. on Wednesday, May 1, 2019.

STRATEGIC PLAN:

Element 7.0 – Strategic Partners

FISCAL IMPACT:

None

SDRMA
SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY

1112 I Street, Suite 300
Sacramento, California 95814-2865
T 916.231.4141 or 800.537.7790 * F 916.231.4111

Maximizing Protection. Minimizing Risk. * www.sdrma.org

Agenda: 2.21.19
Item: 11a

Notification of Nominations – 2019 Election
SDRMA Board of Directors

January 24, 2019

RECEIVED
JAN 28 2019
SAN LORENZO VALLEY
WATER DISTRICT

Mr. Charles Baughman
Board President
San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, California 95006-9119

Dear Mr. Baughman:

Notice of Nominations for the Special District Risk Management Authority (SDRMA) Board of Directors 2019 Election is being provided in accordance with the SDRMA Sixth Amended and Restated Joint Powers Agreement. The following nomination information is enclosed: Nomination Packet Checklist, Board of Director Fact Sheet, Nomination/Election Schedule, SDRMA Election Policy No. 2017-10, sample Resolution for Candidate Nomination and Candidate's Statement of Qualifications Form.

General Election Information - Three Director seats are up for election. The nomination filing deadline is Wednesday, May 1, 2019. Ballots will be mailed to all SDRMA member agencies in mid-May. Mail-in ballots will be due back to SDRMA not later than 4:30 p.m. Wednesday, August 21, 2019.

Nominee Qualifications - Nominees must be a member of the agency's governing body or a management employee (see SDRMA Election Policy 2017-10, Section 4.1) and be an active member agency of both SDRMA's Property/Liability and Workers' Compensation Programs. Candidates must be nominated by Resolution from their member agency's governing body and complete and submit a "Candidate's Statement of Qualifications".

Nomination Documents and Information - Nomination documents (Nominating Resolution and Candidate's Statement of Qualifications) and nomination guideline information may also be obtained on SDRMA's website at www.sdrma.org. To obtain documents electronically:

From the SDRMA homepage, scroll down and click on the "2019 Nomination & Election Information" box. All necessary nomination documents and election information may be downloaded and printed.

Term of Office – Directors are elected to 4-year terms. The term of office for the newly elected Directors will begin January 1, 2020 and expire December 31, 2023.

Nomination Filing Deadline – Nomination documents must be received in SDRMA's office no later than 4:30 P.M. on Wednesday, May 1, 2019.

Please contact SDRMA Chief Operating Officer Paul Frydendal at 800.537.7790, if you have any questions regarding the 2019 SDRMA Board of Director Nominations or the election process.

Sincerely,
Special District Risk Management Authority

Laura S. Gill

Laura S. Gill
Chief Executive Officer

2019 Nomination Packet Checklist

SDRMA

SDRMA Board of Directors
Nomination and Election Guidelines

January 9, 2019, marked the official commencement of the election process for the SDRMA Board of Directors. Three seats on the Board of Directors are up for election in 2019.

For your convenience we have enclosed the necessary nomination documents and election process schedule. Please note that some items have important deadlines. All documents contained in this packet, as well as additional information regarding SDRMA Board elections, are available on our website www.sdrma.org and/or by calling SDRMA Chief Operating Officer Paul Frydendal at 800.537.7790.

____ **Attachment One:** **SDRMA Board of Directors Fact Sheet:** This document reviews the Board of Directors' Roles and Responsibilities along with other important information.

____ **Attachment Two:** **SDRMA Board of Directors 2019 Nomination/Election Schedule:** Please review this document for important deadlines.

____ **Attachment Three:** **SDRMA Election Policy No. 2017-10:** A Policy of the Board of Directors of the Special District Risk Management Authority establishing guidelines for Director elections.

____ **Attachment Four:** **Sample Resolution for Candidate Nomination:** A resolution of the Governing Body of the Agency nominating a candidate for the Special District Risk Management Authority Board of Directors.

____ **Attachment Five:** **Candidate's Statement of Qualifications:** Please be advised that no candidate statements are endorsed by SDRMA. Candidate's Statements of Qualification will be distributed to the membership with the SDRMA election ballot, "exactly as submitted" by the candidate.

Please complete and return all required nomination and election documents to:

SDRMA Election Committee
C/O Paul Frydendal, COO
Special District Risk Management Authority
1112 "I" Street, Suite 300
Sacramento, California 95814

Attachment One

SDRMA

SDRMA BOARD OF DIRECTORS
FACT SHEET

Fact Sheet

SDRMA

SDRMA Board of Directors
Role and Responsibilities

Special District Risk Management Authority (SDRMA) is a public entity Joint Powers Authority established to provide cost-effective property/liability, worker's compensation, health benefit coverages and comprehensive risk management programs for special districts and other public agencies throughout California. SDRMA is governed by a Board of Directors elected from the membership by the programs' members.

Number of Board Members	SDRMA Board of Directors consists of **seven Board Members**, who are elected at-large from members participating in either program.
Board of Directors' Role	SDRMA Board of Directors provide effective governance by supporting a unified vision, ensuring accountability, and setting direction based on SDRMA's mission and purpose, as well as establishing and approving policy to ensure SDRMA meets its obligations and commitment to its members.
Board of Directors' Responsibilities	Board Member responsibilities include a commitment to: serve as a part of a unified governance body; govern within Board of Directors' policies, standards and ethics; commit the time and energy to be effective; represent and make policy decisions for the benefit, and in the best interest, of all SDRMA members; support collective decisions; communicate as a cohesive Board of Directors with a common vision and voice; and, operate with the highest standards of integrity and trust.
Three Seats For this Election	Elections for Directors are staggered and held every two years, four seats during one election and three seats in the following election. **Three seats are up for election this year.**
Term of Directors	Directors are elected for **four-year terms**. Terms for directors elected this election begin January 1, 2020 and end on December 31, 2023.
Board Member Travel Reimbursement	Board Members are reimbursed for reasonable travel and lodging in accordance with SDRMA Board Policy Manual 2017-01 and applicable laws and are allowed to claim a stipend of $195 per meeting day or for each day's service rendered as a Member of the Board.
Number of Meetings per Year	The Board meets from **seven to ten times annually** with an average of eight board meetings per year. Generally, the Board does not meet more than one meeting per month.
Meeting Location	SDRMA office in Sacramento, CA and at two conference locations.
Meeting Dates	Typically the first Wednesday and Thursday of the month.
Meeting Starting Times	Meetings are typically held **1:00 to 5:30 p.m. Wednesday** and **8:00 to 10:00 a.m. Thursday**.
Meeting Length	Meetings are **four to six hours** on average.
Average Time Commitment	Commitment per month ranges from **15 to 20 hours**.

"The mission of Special District Risk Management Authority is to provide risk financing and risk management services through a financially sound pool to California public agencies, delivered in a timely and responsive cost-efficient manner."

Attachment Two

SDRMA

SDRMA BOARD OF DIRECTORS
2019 NOMINATION/ELECTION SCHEDULE

2019 Nomination/Election Schedule

SDRMA

JANUARY						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

FEBRUARY						
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24	25	26	27	28		

MARCH						
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17	18	19	20	21	22	23
24 31	25	26	27	28	29	30

APRIL						
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MAY						
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26	27	28	29	30	31	

JUNE						
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23 30	24	25	26	27	28	29

JULY						
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AUGUST						
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SEPTEMBER						
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29	30					

OCTOBER						
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27	28	29	30	31		

NOVEMBER						
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DECEMBER						
S	M	T	W	T	F	S
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22	23	24	25	26	27	28
29	30	31				

TASK TIMELINE
1/9 Board approves Election Schedule
1/24-25 Mail Notification of Election and
Nomination Procedure to Members in January at
least 90 days prior to mailing Ballots **(111 actual days)**
5/1 Deadline to return Nominations
5/2 Tentative Election Comm. Reviews Nominations
5/16-17 Mail Ballots at least 60 days prior to
ballot receipt deadline **(96 actual days)**
8/21 Deadline to Receive Ballots
8/22 Tentative Election Comm. Counts Ballots
8/23 Election Committee Notifies Successful
Candidates and Provides Them With
Upcoming Board Meeting Schedule
9/25 Directors' Elect Invited to CSDA Annual
Conf/SDRMA Breakfast/Super Session
11/6-7 Directors' Elect Invited to SDRMA
Board Meeting
1/2020 Newly Elected Directors Seated and
Election of SDRMA Board Officers

Rev. 11/9/2018

Attachment Three

SDRMA

SDRMA BOARD OF DIRECTORS ELECTION POLICY NO. 2017-10

SDRMA
SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY

Policy No. 2017-10

A POLICY OF THE BOARD OF DIRECTORS OF SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY ESTABLISHING GUIDELINES FOR DIRECTOR ELECTIONS, DIRECTOR APPOINTMENTS, AND CREATION OF A SUPERVISING ELECTION COMMITTEE

WHEREAS, SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY (SDRMA) is a joint powers authority, created pursuant to Section 6500, et. seq. of the California Government Code; and·

WHEREAS, the Board of Directors recognizes that it is in the best interest of the Authority and its members to adopt a written policy for conducting the business of the Board; and

WHEREAS, establishing guidelines for Director elections and appointments will help ensure a process that is consistent for all nominees and candidates, will promote active participation by SDRMA members in the election/appointment process, and will help ensure election/appointment of the most qualified candidate(s); and

WHEREAS, the Bylaws provide the Board with the option of conducting the election using a mail-in ballot process; and

WHEREAS, the Board of Directors of SDRMA has an overriding and compelling interest in insuring the accuracy of the election/appointment process of its Board members through the creation of an election committee;

NOW, THEREFORE, it is the policy of the Board of Directors of SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY, until such policy shall have been amended or rescinded, that the following procedures shall be followed when conducting Director elections or filling a Director vacancy by appointment:

1.0. Election Schedule

1.1. Not later than the first Board meeting of each election year, the Board of Directors shall approve an election schedule based on the following criteria and time frames.

2.0. Election Committee

2.1. The Board of Directors herein establishes an election committee with the following composition, duties and responsibilities; The five (5) members of the Election Committee shall include two presently sitting members of the Board of Directors of SDRMA whose seats are not up for election, the Chief Operating Officer of SDRMA, and the CPA/auditor regularly used and retained by SDRMA at the time of counting ballots of and for an election to the Board of Directors. For good reason found and stated, the Board of Directors of SDRMA may appoint any CPA/auditor who, in the discretion of the Board of Directors, would appropriately serve the Election Committee. The General Counsel for SDRMA shall also sit as a member of the Election Committee with the additional obligation of providing legal advice to the balance of the Committee as legal questions may arise.

3.0. Member Notification of Election

3.1. Authority staff shall provide written notification, of an election for the Board of Directors, to all member agencies during January of each election year. Such written notification shall be provided a minimum of ninety (90) days prior to the distribution of ballots and shall include; (1) the number of Director seats to be filled by election; (2) a copy of this nomination and election procedure; and (3) an outline of nomination/election deadline dates.

SDRMA
SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY

Policy No. 2017-10

4.0. Qualifications

4.1. A candidate seeking election, re-election or appointment to SDRMA's Board of Directors must be a member of the Governing Body or a management employee of an SDRMA member participating in both the Property/Liability and Workers' Compensation Programs. To qualify as a "management employee," the candidate must be a management-level (as determined by the Governing Body) employee whose wages are reported to the IRS on a "W-2" form. Only one (1) representative from any Member may serve on the Board of Directors at the same time. [Per Bylaws, Article II, (2) (b)]

4.2. Each nominated candidate must submit a properly completed "Statement of Qualifications" (required form attached) with an original signature (electronic signatures are not acceptable) on or before the filing deadline in May in order for the candidate's name to be placed on the official ballot. A candidate shall provide responses to all questions on the candidate's "Statement of Qualifications". Each nominated candidate's "Statement of Qualifications" must be filed in SDRMA's office on or before the aforementioned deadline by: (1) personal delivery; (2) U.S. mail; or (3) courier. When ballots are mailed to the membership, each candidate's "Statement of Qualifications" form will be distributed to the membership exactly as submitted by the candidate to SDRMA. However, any attachments submitted by the candidate(s) with the Statement of Qualifications will not be sent by SDRMA with the ballots to any members.

4.3. If a nominated candidate elects not to use the provided form "Statement of Qualifications," and prepares instead the candidate's own completed form, the candidate's form must include the title "Statement of Qualifications" and contain exactly all information required and requested by the provided form.

NOTE: The candidate's "Statement of Qualifications" form must be submitted as a part of the nominating process. When ballots are mailed to the membership, each candidate's "Statement of Qualifications" form will be distributed "exactly as submitted" to SDRMA, except that any attachments submitted by the candidate will not be sent to any SDRMA members.

4.4. A candidate who does not submit a Candidate's Statement of Qualifications that complies with Section 4.2 or 4.3 will be disqualified by the SDRMA Election Committee.

5.0. Nominating Procedure

5.1. Candidates seeking election or reelection must be nominated by action of their respective Governing Body. Only one (1) candidate may be nominated per member agency and one (1) candidate shall not represent more than one (1) member agency. A resolution from the candidate's district/agency Governing Body nominating the candidate must be received by the Authority on or before the scheduled date in May. (A sample of the resolution is enclosed). Actual receipt by the Authority on or before the scheduled deadline date in May is required. The resolution nominating the candidate may be hand-delivered to the Authority or sent by U.S. mail. In the event a candidate is nominated by two (2) or more member agencies, he or she shall represent the member agency whose nominating resolution is first received by the Authority. The other member agency or agencies that nominated the candidate shall be entitled to select a replacement nominee as long as a resolution nominating the replacement is received by the Authority prior to the scheduled deadline date.

5.2. A member may not nominate a candidate unless that member is participating in both the Property/Liability and Workers' Compensation Programs and is in "good standing" on the date the nominations are due. "Good standing" is defined as no accounts receivable due to SDRMA which is more than ninety (90) days past due.

5.3. No earlier than the day after the deadline for receipt of nominations, the Election Committee, as hereinabove defined and comprised, shall review all nominations received from members, and will reject any nominations that do not meet all of the qualifications specified and set forth in this policy. The Election

SDRMA
SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY

Committee's decisions regarding the qualification of nominees are final. Following the Election Committee's review of all nominations, the Election Committee shall direct that a ballot be prepared stating and listing all of the qualified nominees. The ballot of qualified nominees shall be distributed to the membership for election by mail as described below.

5.4. Upon verification or rejection of each nominee by the Election Committee, staff will mail acknowledgment to both the nominee and the district/agency of its acceptance or rejection as a qualified nominee for election.

5.5. A nominee requesting that his/her nomination be withdrawn prior to the election, shall submit such requests in writing to SDRMA's office a minimum of three (3) days prior to the scheduled date for mailing the ballots. After that date, all qualified nominees names shall appear on the ballot mailed to the membership.

6.0. Terms of Directors

6.1. The election of directors shall be held in each odd-numbered year. The terms of the directors elected by the Members will be staggered. Four directors will serve four-year terms, to end on December 31 of one odd-numbered year. Three directors will serve four-year terms, to end on December 31 of the alternate off-numbered year. [Per Bylaws, Article II, (3), paragraph 1].

7.0. Campaigning

7.1. SDRMA staff will mail each qualified candidate's "Statement of Qualifications", "exactly as submitted" by the candidate with the ballots to the membership.

7.2. Candidates, at their own expense, may distribute additional information to member agency(s) after the ballots have been mailed and prior to the election.

7.3. SDRMA staff is prohibited from actively promoting a candidate or participating in the election process while on Authority premises.

7.4. SDRMA staff may provide member information, mailing lists, financial reports or operational data and information, that is normally available through the Public Records Act, to candidates to assist them in their research and campaigning. In addition to obtaining such information under the Public Records Act, candidates may request SDRMA staff prepare mailing labels for the distribution of campaign materials to member agencies. Under existing policy, charges will apply for this service. The SDRMA logo is trademarked for use by SDRMA only. Neither the logo, nor any other Trademark of SDRMA may be used in any campaign literature. No campaign literature is to imply support of any candidate by SDRMA.

7.5. SDRMA election mailings to the membership, including ballots and candidates' "Statement of Qualifications", shall be sent via first class mail.

8.0. Limitations on Campaigning

8.1. As used in this section the following terms have the following meanings:

"Campaign Activity" means any activity that expressly advocates the election or defeat of a candidate or provides direct support to a candidate for his or her candidacy. "Campaign activity" does not include the incidental and minimal use of public resources, such as equipment or office space, for campaign purposes or the use of public resources to nominate a candidate or vote in any Board of Directors election.

SDRMA
SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY

"Candidate" means an individual who has been nominated by the Member Agency to have his or her name listed on the ballot for election to the Board of Directors.

"Expenditure" means a payment of Member Agency funds that is used for communications that expressly advocate the election or defeat of a clearly identified candidate. "Expenditure" does not include the use of public funds to nominate a candidate or vote in any Board of Directors election.

"Public resources" means any property or asset owned by the Member Agency, including, but not limited to, land, buildings, facilities, funds, equipment, supplies, telephones, computers, vehicles, travel, and Member Agency-compensated time.

8.2. An officer, official, employee, or consultant of a Member Agency may not expend or authorize the expenditure of any of the funds of the Member Agency to support or oppose the election or defeat of a candidate for the Board of Directors.

8.3. No officer, official, employee, or consultant of a Member Agency shall use or permit others to use public resources for campaign activity.

8.4. At any time during an election campaign, if a Member Agency or its officers, officials, employees or consultants violate this section, that Member Agency shall be ineligible to nominate a candidate for the Board of Directors election in which the violation occurred. Any candidate of an offending Member Agency shall be deemed to have withdrawn his or her candidacy. Prior to declaring a Member Agency ineligible to nominate a candidate or a specific candidate's candidacy withdrawn, the Elections Committee shall hold a hearing to determine whether or not a violation of this section occurred. The hearing shall be conducted pursuant to reasonable procedures that the Elections Committee shall prescribe, provided that the affected Member Agency or candidate shall have an opportunity to dispute the violation. At the conclusion of the hearing, the Elections Committee shall determine by a majority vote whether the violation occurred.

9.0. Balloting

9.1. A ballot containing nominees for the Board of Directors, accepted and approved by the Election Committee, shall be mailed by first class mail, to each SDRMA member agency, except as provided in Section 9.2 below, no less than sixty (60) days prior to the deadline for receiving ballots and the closing date for voting. Ballots shall show the date and time the ballots must be received in SDRMA's office. A self-addressed, stamped, return envelope shall be mailed with each ballot.

9.2. In the event that the number of qualified/approved nominees is equal to or less than the number of director seats up for election, the mailing of the ballots as outlined in Section 9.1 shall be waived.

9.3. Only those qualified nominees approved by the Election Committee will be eligible candidates on the ballot. Write-in candidates shall not be accepted.

9.4. It is required that the Governing Body of each member vote on behalf of their agency at a public meeting and the ballot MUST be signed by the agency's Presiding Officer.

9.5. A member may not vote unless the member was a member of the Authority in "good standing" on or before the nomination due date for the pending election. "Good standing" is defined as no accounts receivable due to SDRMA which is more than ninety (90) days past due.

9.6. A member may cast only one (1) vote for the same candidate. By way of example, if there are four (4) candidates on the ballot, a member may not cast two (2) to four (4) votes for any single candidate. Any ballot casting more than one (1) vote for the same candidate will be considered void.

9.7. A member may vote by using the official ballot provided by SDRMA, or a copy of SDRMA's original ballot, or a reasonable duplicate prepared by the member agency. Whichever of the three foregoing formats is used, the ballot must contain an original signature and confirmation that the ballot was approved at a public meeting of the agency's Governing Body. Ballots submitted without an original signature and/or without confirmation that the form of the ballot was approved at a public meeting of the agency's Governing Body will be considered void.

9.8. Ballots may be returned using either hand-delivered or mailed in ballots - faxed or e-mailed ballots will not be accepted. Mailed in ballots must be addressed to, and hand-delivered ballots must be delivered to, the Special District Risk Management Authority office presently located at 1112 I Street, Suite 300, Sacramento, California 95814-2865.

9.9. Any ballot received after the specified deadline will not be counted and will be considered void.

10.0. Election Results

10.1. All ballots will be opened and counted at SDRMA's office only after the deadline for receiving ballots. Ballots will be opened by SDRMA's Election Committee, no more than five (5) days after the closing deadline. Candidates receiving the highest number of votes shall be declared the elected director(s).

10.2. In the event of a tie, a coin toss shall be used to determine the elected director. The coin toss shall be conducted by the Election Committee at the time and place of the conclusion of counting ballots.

PROCEDURE: In the event more than two (2) candidates tie, the coin toss shall be between two (2) candidates at a time based on the order in which their name appeared on the ballot This process shall be repeated, as needed, in cases where there are more than two (2) candidates.

10.3. Excluding tie votes, within five (5) days after the ballots are opened and tabulated Authority staff shall advise the candidates and their respective agency in writing of the final election results. Copies of the results shall also be mailed/distributed to SDRMA's Board of Directors, staff and consultants and published in the first available CSDA newsletter.

10.4. If a director-elect withdraws after the election or fails to accept the Director seat prior to December 31, the Board shall name a new director-elect by going back to the ballots and awarding the seat to the candidate receiving the next highest number of votes during the election.

10.5. Staff shall invite newly elected director(s) to attend the Annual Membership meeting and all scheduled Board meeting(s) after confirmation of election results until the director(s) elect assume office. Director(s) elect will be reimbursed for expenses, except for director stipends, in accordance with approved director reimbursement policy (copy of policy shall be provided to newly elected directors).

10.6. A member or candidate dissatisfied with the election result may, within ten (10) days after the ballots are opened and tabulated, file with the Authority a written challenge and appeal. The challenge and appeal must clearly set forth the complaint and any and all facts in support of the challenge and appeal. Within ten (10) days after the ballots are opened and tabulated, the challenge and appeal shall be delivered and received by the Authority. Within five (5) days of receipt of the challenge and appeal, the Authority shall deliver the same to the Election Committee for decision. The Election Committee shall have absolute authority for deciding the challenge and appeal. Notice of the decision of the Election Committee shall be provided to the party filing the challenge and appeal within ten (10) days.

SDRMA
SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY

Policy No. 2017-10

11.0. Director Vacancy

11.1. If a director vacancy(s) occurs (Note 1), appointment of a replacement director for the balance of the unexpired term will be made by the remaining members of the SDRMA Board. In order to accomplish this in an orderly and consistent manner, when a vacancy(s) of an elected Director(s) occurs, the SDRMA Board of Directors, after discussion and consideration, shall, when deemed appropriate, instruct staff to:

a) notify all then member entities that a vacancy has occurred; and
b) said notice shall refer to the applicable Article in the By-laws in advising member entities and their eligible candidates of the steps to take to apply for appointment; and
c) the SDRMA Board shall establish the closing date for the receipt of applications; and
d) candidates shall submit the following, by the date specified in the notice:
    i) a letter of interest; and
    ii) a resume, with particular emphasis on the candidate's knowledge of special districts and risk management; and
    iii) a resolution from, or a letter approved by, the candidate's Governing Body nominating the candidate; and
e) the Election Committee shall review all applications received, and shall reject any that do not meet all of the qualifications specified and set forth in this policy; and
f) upon verification or rejection of each application by the Election Committee, staff will mail acknowledgement to both the applicant and the district/agency of its acceptance or rejection of the applicant as a qualified candidate for appointment; and
g) candidates shall be interviewed at the next regularly scheduled meeting of the SDRMA Board of Directors following the date of closure for the applications. Interviews shall be in person, or if an unforeseen emergency arises, the interview may be by telephone at the same scheduled time; and
h) the SDRMA Board shall make the appointment without undue delay, but need not act at the same meeting.

Note 1: If the Director vacancy occurs within nine (9) months after the date the ballots were counted and certified by the Election Committee or within nine (9) months after a candidate was appointed to fill a vacancy, then the Board shall have the option to interview and appoint the candidate(s) who did not receive sufficient votes to be elected OR to interview and appoint from the pool of candidates from 11.1.g) above. If the Director vacancy occurs in an election year after the Notification of Election is sent to the members, the Board may determine to fill the vacancy by appointing the candidate who receives the next highest number of votes in the election. If the Board determines in its sole discretion that none of these options is appropriate, then staff shall be instructed to proceed with the process described above in steps 11.1 a) to h).

Revised and adopted this 2nd day of November 2017, by the Board of Directors of Special District Risk Management Authority, at a regular meeting thereof.

This Policy No. 2017-10 supercedes Policy No. 2017-03 and all other policies inconsistent herewith.

APPROVED:

Jean Bracy, President
Board of Directors

ATTEST:

Gregory S. Hall, ARM
Chief Executive Officer

Attachment Four

SDRMA

SAMPLE
RESOLUTION FOR
CANDIDATE NOMINATION

Available for download in Microsoft Word file format
visit our website at www.sdrma.org

[AGENCY NAME]

RESOLUTION NO.

A RESOLUTION OF THE GOVERNING BODY OF THE [AGENCY NAME] NOMINATING [CANDIDATE'S NAME] AS A CANDIDATE FOR ELECTION TO THE SPECIAL DISTRICT RISK MANAGEMENT AUTHORITY BOARD OF DIRECTORS

WHEREAS, the Special District Risk Management Authority (SDRMA) is a Joint Powers Authority formed under California Government Code, Section 6500 et.seq., for the purpose of providing risk management and risk financing for California Special Districts and other local government agencies; and

WHEREAS, the Joint Powers Agreement (JPA) and Bylaws of SDRMA set forth director qualifications, terms of office and election requirements; and

WHEREAS, the Board of Directors of SDRMA established procedures and guidelines for the Director Election process; and

WHEREAS, the Board of Directors of SDRMA established a policy requiring candidates seeking election to the SDRMA Board of Directors to be: 1) a member of the agency's governing body or management employee per SDRMA Election Policy 2017-10, Section 4.1 and be an active member agency of **both** SDRMA's Property/Liability and Workers' Compensation Programs, and 2) be nominated by Resolution of their member agency's governing body, and 3) each nominated candidate must submit a completed and signed "Candidate's Statement of Qualifications" on or before the May 1, 2019 filing deadline in order for the candidate's name to be placed on the official ballot.

NOW, THEREFORE, BE IT RESOLVED:

1. The governing body of [AGENCY NAME] nominates [CANDIDATE'S NAME], its [POSITION TITLE], as a candidate for the Board of Directors of the Special District Risk Management Authority.

2. [ONLY IF CANDIDATE IS NOT A MEMBER OF THE AGENCY'S GOVERNING BODY: The governing body of [AGENCY NAME] has determined that [CANDIDATE'S NAME] is a management employee for purposes of SDRMA Election Policy 2017-10, Section 4.1].

3. The governing body of [AGENCY NAME] further directs that a copy of this Resolution be delivered to SDRMA on or before the May 1, 2019 filing deadline.

ADOPTED this [DATE] of [MONTH/YEAR] by the Governing Body of [AGENCY NAME] by the following roll call votes:

AYES:	[LIST NAMES of GOVERNING BOARD VOTES]
NAYES:	"
ABSTAIN:	"
ABSENT:	"

APPROVED

_____

President – Governing Body

ATTEST

_____

Secretary

Attachment Five

SDRMA

CANDIDATE'S STATEMENT OF QUALIFICATIONS

Available for download in Microsoft Word file format
visit our website at www.sdrma.org

Special District Risk Management Authority
Board of Directors
Candidate's Statement of Qualifications

This information will be distributed to the membership with the ballot, "exactly as submitted" by the candidates – no attachments will be accepted. No statements are endorsed by SDRMA.

Candidate* _____

District/Agency _____

Work Address _____

Work Phone _____ Cell Phone _____

*The name or nickname and any designations (i.e. CPA, SDA, etc.) you enter here will be printed on the official ballot, exactly as submitted.

Why do you want to serve on the SDRMA Board of Directors? (Response Required)

_____

What Board or committee experience do you have that would help you to be an effective Board Member? (SDRMA or any other organization) (Response Required)

_____

Special District Risk Management Authority
Board of Directors
Candidate's Statement of Qualifications

What special skills, talents, or experience (including volunteer experience) do you have? (Response Required)

What is your overall vision for SDRMA? (Response Required)

I certify that I meet the candidate qualifications as outlined in the SDRMA election policy. I further certify that I am willing to serve as a director on SDRMA's Board of Directors. I will commit the time and effort necessary to serve. Please consider my application for nomination/candidacy to the Board of Directors.

Candidate Signature _____ Date_____

MEMO

To: Board of Directors

From: District Manager

Prepared By: Director of Operations

SUBJECT: SYSTEM WIDE WATER LINE LEAK DETECTION PROJECT FINAL REPORT

DATE: February 21, 2019

RECOMMENDATION

It is recommended that the Board of Directors review this memo and accept the District's System Wide Water Line Leak Detection Project Final Report

BACKGROUND

In Fiscal Year 2018 -19 the District undertook a full system wide leak detection program approximately 100 +/- miles of waterline. Leak detection was spread out over two months October 2018 and November 2018 each being two weeks of leak detection. The District contracted with Utility Services Associates (USA), Seattle, Washington (finial reports attached). Leak detection was performed using state of the art acoustical listening devices and digital correlation technology.

The project was broken down into two different phases.
1. Survey Phase – Sounding of appurtenances and recording all leak anomalies detected for further investigation.

2. Pinpointing Phase – pinpoint all anomalies that were detected during the survey phase.

After pinpointing District staff returned and facilitated repairs. It has been found that the gallons per minute were estimated a little higher than actually measured on most of the leaks and the number of leaks was slightly lower (due to no actual leak found when crews went out to make repairs) which is understandable. Leaks were found system wide with the greater number of leaks found on older areas of the distribution system (see map presented at Board meeting). To date 32 of 40 leaks/locations that were discovered as part of the leak detection project have been repaired in addition to the number of leaks that are reported that surface. Leaks reported have not reduced in conjunction with the leak detection project and staff spends a considerable amount of time repairing leaks.

Total Leaks Pinpointed

Total Distance Leak detected in Miles	100 +/-
Total Days in Leak Detection	20
Leaks Pinpointed	
• Main Line	20
• Valve	5
• Hydrant	2
• Service Line	6
• Service Connection	4
• Meter	2
• Other	1
Total Leaks Pinpointed	40

Estimated Total Water Loss Identified with leak detection

Gallons Per Minute	128.20
Gallons Per Day	184,608
Gallons Per Month	5,615,160
Gallons Per Year	67,381,920

After pinpointing leak detection was performed District staff performed repairs. As part of the repair process staff measured/estimated actual leakage to obtain accurate measurements. Actual repairs and water leakage is as follows;

Total Leaks Repaired/GPM

Total Leaks Repaired	32
Gallons Per Minute	62.13 +/-
Gallons Per Day	89,467
Gallons Per Month	2,721,294
Gallons Per Year	32,655,528

In reviewing 2018 calendar year water production the District produced 691,918,479 gallons for the year. The total leaks repaired so far found through leak detection add up to 32,655,528 gallons per year, would be 4.72 % of the total water produced for calendar year 2018. This number does not include leaks repaired in the normal course of the work year.

Leak detection project is considered a success. Professional contract leak detection has now been performed at the District in 2014 and 2018. Cost for contract leak detection is approximately $25,306. This cost does not include District staff time, materials, and equipment for repairing leaks. The District will be addressing future leak detection with industries standards every 3 to 5 years.

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Final Report

Water Line Leak Detection Project for:
San Lorenzo Water District
Boulder Creek, CA

Project Dates:
10/01/2018 through 10/12/2018
&
11/05/2018 through 11/16/2018

19655 1st Ave. South, Suite 101
Seattle, WA 98148

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UTILITY SERVICES
ASSOCIATES
Leak Detection & Solutions

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ASSOCIATES
Leak Detection & Solutions

December 18, 2018

San Lorenzo Valley Water District
Attn: James Furtado
13060 Hwy. 9
Boulder Creek, CA 95006

Re: **October / November 2018 Water Leak Detection Survey and Pinpointing Project**

Dear Mr. Furtado:

Utility Services Associates, LLC, (USA) is pleased to submit the enclosed Final Report on leak detection services recently completed.

The information contained in this Final Report details the procedures and results specific to this project. When applicable, recommendations have been made concerning the best approach for the repair of leaks detected and preparation for future leak detection projects.

As you review this Final Report, please pay close attention to the Leak Consultant's remarks and field observations in the Project Observation section of this report. These may assist you in determining the best course of action regarding specific leaks.

At times specific individual Leak Reports may differ in the Final Report from those provided during the course of the project. These changes, usually insignificant, generally pertain to the manner in which we report leaks and do not alter the methods used or results of pinpointing.

We strongly suggest you contact us prior to excavating any leak that we have labeled with "CAUTION" for further explanation.

This leak detection project is productive since we pinpointed leakage that, when repaired, can reduce your water loss, saving San Lorenzo Valley Water District dollars now and in the future. We appreciate your confidence in USA. If you have any questions, call us at (877) 585-5325 or (206) 429-3751.

Sincerely,

Rob Meston
President

19655 1ST AVE SOUTH • SUITE 101 • SEATTLE, WA 98148 P 877.585.LEAK F 206.429.3441
LEAKDETECTIONSERVICE.COM

EXECUTIVE SUMMARY

PROJECT OBSERVATIONS

PROJECT OBSERVATIONS
(Water Distribution Lines)

GENERAL

USA recently completed a water system leak detection project for the San Lorenzo Valley Water District in Boulder Creek, CA. The fieldwork portion of the project was performed October 01, 2018 through November 16, 2018. The information listed below was generated by data collected by USA Water Loss Consultants Rob Melick and Thomas Olson during the fieldwork portion of the project.

SPECIFICS

The project was broken down into two different phases:

1. ***Survey Phase*** – sounding of appurtenances and recording all leak anomalies detected for further investigation.

2. ***Pinpointing Phase*** – pinpointing all anomalies that were detected during the survey phase.

1. *Survey Phase Information*

The project was completed by two consultants. The first part was completed between October 1 and 12, 2018 by Rob Melick. He completed approximately 63.5 miles of distribution line. Thomas Olson completed the second part of the survey between November 5 and 16, 2018. Thomas surveyed approximately 98 miles of water distribution line. A standard acoustic survey technique was deployed due to the sound travel characteristics associated with metallic and AC lines tested. This technique includes sounding available appurtenances (hydrants, valves and services) roughly every 300'-500'.

System Maintenance Items

- Laurel Dr and Hwy 9 – valve paved over.
- The hydrant valve can at Westwood Rd and E Zayante Rd needs to be cleaned out
- The valve cans at Plateau Dr and Redwood Dr needs to be cleaned out
- The valve cans at Hidden Valley Dr and Woodview Dr needs to be cleaned out
- The valve cans at Hidden Valley Dr and Noteware Dr needs to be cleaned out
- The valve can at the west end of Noteware Dr needs to be cleaned out
- The valve cans at Noteware Dr and Webster Dr needs to be cleaned out
- The valve cans at Eduardo Ave and Pedro Ave needs to be cleaned out

Overall, the survey portion of the project went well. We detected and recorded seventy-three (73) leak type noises for reinvestigation during the Pinpointing Phase.

2. *Pinpointing Phase Information*

Upon completion of the Pinpointing Phase, we have pinpointed forty (40) leaks. For more information and a drawing of each leak, please refer to the Leak Report section of this Final Report. In addition, we have listed one (1) location as "undefined", which is an area we detected leak type noise, however, after extensive investigation, we were unable to pinpoint the noise. We have also listed two (2) possible consumer side leaks. Please

refer to the Leak Report section of the Final Report for more information and a drawing of each leak.

Additional Pinpointing Observations
During the survey, three areas of concern were inspected at the water departments request. The first location was 245 Spreading Oak Dr in Scotts Valley. No noise was detected in this area, through points sounding or ground mic inspection. The main was correlated with no results as well. It is believed the moisture present in this area is long term residual build-up due to irrigation run-off from neighboring properties.

The second location at 604 West Dr in Lompico. While inspecting the location, the main line blew out at the point of concern due to a compromised 4" T fitting. The line was repaired immediately.

The third location is at 5739 CA-9(HWY-9) in Felton. No noise was detected through point sounding, ground mic inspection, or correlation. According to Don and Joe, the location of the moisture is the sight of a previous repair. It is recommended that the main be exposed at this location as it is possible water is weeping out around the repair coupling in a manner that doesn't produce noise.

For the undefined leak on Condor Ave, the general vicinity of the issue has been narrowed down to the service and main near 675 Condor Ave. No accurate location could be determined. It is recommended the area be probed for moisture and if no indicators of moisture are found, the area should be monitored and resurveyed during the next visit if the issue is still present.

One noise detected at 11516 Lake Blvd was repaired prior to pinpointing.

Leak noise was detected at 6390 Hwy 9 and 11500 Clear Creek Rd. The meters did not appear to be turning or registering usage. Once the meter was shut off the leak noise stopped. We recommend replacing or testing this "slow meter" as it is contributing to non-revenue water loss.

There was visible consumer lead detected at 8668 Hwy 9 (Highlands County Park). It is on the back-flow preventer on the right side and two other possible consumer side leaks; 165 Condor Ave and 5309 McKinley Ave.

The meter at 405 Deer Run Rd appeared to be reading usage improperly. While a leak wasn't detected and a possible problem on the customer side isn't suspected, the meter should be flow tested to insure proper performance.

RECOMMENDATIONS

We recommend a continued focus on water loss and real loss reduction. Once repairs are made, note any observed differences in our estimates as errors in our estimates will have a significant impact on water loss numbers if this report will be used for that purpose or to support other estimated/actual real loss.

As a large amount of old 2" galvanized pipe is present in the system, it is recommended that a routine leak survey be continued on the system to stay on top of issues that develop over time due to age, usage, and other factors.

CONCLUSION

Overall, the survey was successful as we found a significant amount of water loss in the system. We believe repair will reduce water losses experienced by the District.

We would like to thank James Furtado, Andy Robustelli, Don Long and Joe Davis for their assistance during the project. We would also like to thank Ricardo Villa and Beau Sifton for providing traffic control during the night work portion of the project. We look forward to working with the San Lorenzo Valley Water District on future conservation projects.

Rob Melick
Thomas Olson
Water Loss Consultants

SURVEY PHASE REVIEW

SURVEY PHASE REVIEW
(Water Distribution Lines)

The first step in our survey was to review the distribution maps of the system for familiarization of the pipe network and available appurtenances to be used for contact points.

As the leak survey progressed, we determined the distances that even quiet leak type sounds traveled in various pipe materials, pipe sizes and pressure zones in each area of the system. This might have been done by slightly turning on fire hydrants, hose bibs, etc., creating a simulated, quiet leak sound. Appurtenances in that area were then checked with a sound amplification instrument to see how far the simulated leak sounds traveled, thus determining how often we would make contact with appurtenances in a given section of the water distribution system. In most areas, contact was made with pipe appurtenances at intervals no greater than 300 feet where contact points were available and accessible at pre-determined distances as noted in Paragraph B (whichever distance is necessary to obtain complete coverage). This allowed for even more quiet leaks to be located. Whenever we surveyed PVC lines, all available appurtenances were contacted.

We then conducted a comprehensive survey by making physical contact with all available main line appurtenances (valves, hydrants, etc.) and necessary customer services. USA used a sonic leak detection amplification instrument designed for this purpose.

Appurtenances Surveyed

Hydrant	459
Valves	831
Services	700
Other	88
Total	**2,078**

When normal contact points were not available or could not be created within a reasonable distance, we made an attempt to use a sonic ground listening instrument to make physical ground contact at intervals no greater than 6 feet directly over the pipe. If conditions did not allow this procedure our Leak Consultant advised you at time of project and notes of such are included in the Project Observations. Ground listening devices are employed when ground cover is pavement, cement or similar hard surface.

When ground cover was not a hard surface and normal contact points were not available, we made an attempt to use probe rods or a specially designed sounding plate at 6-foot intervals. A sound amplification instrument with 3VG or greater transducer was employed in conjunction with this equipment, directly over the pipe. If conditions did not allow this procedure our Leak Consultant advised you at time of project and was detailed in the Project Observations section of this Final Report. Direct contact to the main line at intervals outlined in Preparation for Service resulted in the most thorough survey.

Areas Surveyed

Street	From	To	Distance
E Zayante Rd	Lompico Rd	East Creek Rd	9,100
E Creek Rd	E Zayante Rd	End	370
Westwood Rd	E Zayante Rd	End of line	950
W Hill Rd	E Zayante Rd	End	300
Rosebloom Ave	Zayante Dr	End of line	1,960
Zayante Dr	E Zayante Rd	End	540
Waner Way	E Zayante Rd	End	1,030
Laurel Way	E Zayante Rd	End	300
Creekside Way	E Zayante Rd	End	900
Madrone Way	E Zayante Rd	End	300
Zayante Dr	E Zayante Rd	End	1,100
Lake Blvd	Creekwood Dr	Coleman Ave	11,100
Visitar St	Lake Blvd	End	3,400
Oceanview Ave	Lake Blvd	Lakeview Ave	440
Lakeview Ave	Oceanview Ave	Lakeshore Dr	2,150
Oceanview Ave	Edgewood Dr	Bonita St	2,880
Tromba Rd	Oceanview Ave	End	550
Valdez Rd	Oceanview Ave	End	400
Mellow Hollow Rd	Valdez Rd	End	350
Edgewood Dr	Lakeview Ave	Coleman Ave	860
Lakeshore Dr	Lake Blvd	End	1,760
Vanallen Rd	Lakeshore Dr	Lake Blvd	1,700
Coleman Ave	Edgewood Dr	Lake Blvd	4,000
Volver Ave	Coleman Ave	Gladys Ave	2,740
Gladys Ave	Coleman Ave	Volver Ave	600
Madrone Ave	Gladys Ave	Whilaway Ave	1,080
Idlewild St	Volver Ave	End	1,150
La Lena St	Coleman Ave	End	1,100
Juntar St	Coleman Ave	Zappa Ct	1,340
Zappa Ct	Juntar St	Lake Blvd	380
Old Mill Ave	Lompico Rd	End of line	1,000
Lompico Rd	Old Mill Ave	Carol Ave	3,260
Fresco St	Lompico Rd	End of line	500
Carrol Ave	Lompico Rd	Lake Blvd	2,780
Spring St	Carrol Ave	End of line	200
Arbol St	Carrol Ave	End of line	340
Paseo St	Carrol Ave	End of line	240
Lilac St	Carrol Ave	End	260
Creekwood Dr	Lompico Rd	Paseo St	1,510
West Dr	Lompico Rd	Lewis Tank	6,780
Redwood Dr	West Dr	End	2,420
Laguna St	Redwood Dr	West Dr	410
Shady Way	Redwood Dr	End	200
Vera Ave	West Dr	End	2,880
Lomita Ave	West Dr	End	2,560
Padre St	Lomita Ave	Vera Ave	440
Arbol Ave	Lomita Ave	Vera Ave	340
Lenore Way	West Dr	End	1,960

Winifred Way	West Dr	End of line	380
Trinkling Creek Dr	West Dr	End	1,370
Knoll Way	West Dr	End	350
Sequoia Ave	West Dr	End	1,220
Portola Way	Sequoia Ave	End	490
Trevor St	Sequoia Ave	End	260
E Zayante Rd	Lompico Rd	Zayante Fire Department	6,250
Sylvan Way	E Zayante Rd	End of line	600
Zayante School Rd	E Zayante Rd	End of line	1,940
W Zayante Rd	E Zayante Rd	Moon Meadow Ln	2,580
Storm Ln	W Zayante Rd	End	400
Moon Meadow Ln	W Zayante Rd	End	500
Hidden Glen Dr	Lockewood Ln	Spreading Oak Dr	2,500
Spreading Oak Dr	Hidden Glen Dr	End	3,660
Royal Oak Ct	Hidden Glen Dr	End	400
Bobs Ln	Lockewood Ln	Worth Ln	840
Tan Oak Dr	Lockewood Ln	Worth Ln	840
Worth Ln	Bobs Ln	Tan Oaks Dr	1,060
Sugar Pine Rd	Bobs Ln	Tan Oaks Dr	1,060
Twin Pines Dr	Tan Oaks Dr	Lockewood Ln	1,980
Arrow Head Way	Lockewood Ln	Twin Pines Dr	500
Lockewood Ln	Hidden Glen Dr	Sterling Way	4,250
Sterling Ln	Lockewood Ln	End	360
Locke Way	Lockewood Ln	Dana Ct	640
Dana Ct	Locke Way	End	280
Dunn Ln	Lockewood Ln	End	450
Estrella Dr	Lockewood Ln	Whispering Pines Dr	1,780
Caliente Dr	Estrella Dr	End	350
Collado Dr	Caliente Dr	End	600
Pine Cone Ln	Estrella Dr	Whispering Pines Dr	2,360
Whispering Pines Dr	Lockewood Ln	End of line	5,670
Tan Oak Dr	Lockewood Ln	Baja Sol Dr	450
Lunar Dr	Pine Cone Ln	End	580
Lunar Ct	Lunar Dr	End	160
Baja Sol Dr	Whispering Pines Dr	End	1,910
Baja Sol Ct	Baja Sol Dr	End	380
Pinecone Ln	Whispering Pines Dr	End	190
Loma Linda Ct	Whispering Pines Dr	End	260
Alto Sol Ct	Whispering Pines Dr	End	440
Whispering Pines Ct	Whispering Pines Dr	End	360
Blueberry Dr	Whispering Pines Dr	End	1,680
Blueberry Ct	Blueberry Dr	End	150
La Cuesta Dr	Mt Hermon Rd	Canepa Dr	2,600
El Sereno Dr	La Cuesta Dr	End	1,020
Miraflores Rd	La Cuesta Dr	Runs to end of Cam Sinuoso	1,950
Canepa Dr	La Cuesta Dr	End	800
Elena Dr	Canepa Dr	End	550
View Rd	Glengarry Rd	End	850
Rincon Rd	Glengarry Rd	End	500
Big Trees Rd	Hwy 9	End of line	950

Hwy 9	Big Trees Rd	Laurel Dr	6,130
Arrow Ln	Hwy 9	End	520
River Ln	Hwy 9	End	500
Gail Dr	Hwy 9	End	560
Beth Dr	Gail Dr	Loop	1,030
2" GALV easement line	Lakeside Dr	Manzanita Ave	1,850
Gold Ave	Brookside Way	End	980
McKinley Way	Gold Ave	Barkett Ave	1,020
Manzanita Ave	Jackson Way	End	1,300
Jackson Way	Manzanita Ave	San Lorenzo Ave	920
Taylor Way	Manzanita Ave	End of line	830
Madrona Ave	McKinley Way	End	460
Prospect Ave	McKinley Way	Garfield Way	850
Barkett Ave	McKinley Way	End of line	390
Jefferson Way	Barkett Ln	San Lorenzo Ave	230
San Lorenzo Ave	Hwy 9	Redwood Dr	3,440
Avila Way	San Lorenzo Ave	Buckeye Dr	310
Buckeye Dr	Huckleberry Cir	End	530
Huckleberry Cir	Buckeye Dr	Loop	770
Redwood Dr	Hwy 9	Eaton Dr	4,500
Oak Ave	Hwy 9	Lincoln Way	750
Washington Way	San Lorenzo Ave	Oak Ave	760
Lincoln Way	San Lorenzo Ave	Oak Ave	780
Grant Way	San Lorenzo Ave	End of line	420
Deer Run Rd	San Lorenzo Ave	End	250
Madrona Dr	Redwood Dr	End	950
Felton Quarry Rd	Redwood Dr	End of line	450
Eaton Dr	Redwood Dr	End	850
Pine Dr	Redwood Dr	End	1,100
Brookside Dr	Redwood Dr	End	1,200
Park Ave	Graham Hill Rd	River Rd	530
River Rd	Covered Bridge Rd S	End	1,100
Circle Dr	River Rd	Park Ave	830
Covered Bridge Rd S	Graham Hill Rd	End	580
Felton Shopping Center	Graham Hill Rd	Loop	1,700
Hillcrest Dr	Redwood Dr	End of line	1,980
Skyline Dr	Hillcrest Dr	End	530
Plateau Dr	Valley Dr	Redwood Dr	2,660
Hillside Dr	Hihn St	Redwood Dr	2,000
Orchard Rd	Hillside Dr	End of line	1,350
Crystal Springs Ln	Orchard Rd	End	280
Laurel Dr	Hwy 9	Hillside Dr	1,200
Valley Dr	Redwood Dr	Plateau Dr	1,880
Gushee St	Laurel Dr	Felton Empire Rd	2,350
Russell Ave	Gushee St	Valley Dr	280
Kirby St	Hwy 9	Treatment Plant	450
Felton Empire Rd	Gushee St	Fetherston Way	3,280
Jenny Way	Felton Empire Rd	End	450
Ley Rd	Jenny Way	End of line	300
Fetherston Way	Felton Empire Rd	End of line	900

Lost Acre Dr	Hillcrest Dr	End of line	2,980
Cooper St	Felton Empire Rd	Clearview Pl	1,660
Ashley St	Felton Empire Rd	Farmer St	1,060
Love St	Felton Empire Rd	Blair St	400
Blair St	Ashley St	Love St	1,000
Farmer St	Cooper St	Fall Creek Dr	1,330
Covered Bridge Rd N	Graham Hill Rd	Covered Bridge	760
Clearview Pl	Cooper St	End	550
San Lorenzo Way	Hwy 9	End	1,650
Fall Creek Dr	Hwy 9	Farmer St	2,380
Lazy Woods Rd	Hwy 9	Loop	1,200
El Solyo Heights Dr	Hwy 9	End of line	2,320
Hacienda Way	Hillview Dr	Capelli Dr	780
Capelli Dr	Hacienda Way	End	940
Hillview Dr	El Solyo Heights Dr	Hacienda Way	1,120
Quail Hollow Rd	E Zayante Rd	Glen Arbor Rd	11,040
Cumora Ln	Quail Hollow Rd	End	450
Hidden Valley Dr	Quail Hollow Rd	Noteware Dr	400
Woodview Dr	Hidden Valley Dr	End	710
Webster Dr	Woodview Dr	Noteware Dr	1,300
Quail Terrace	Webster Dr	End	580
Noteware Dr	Webster Dr	End	1,530
Marion Ave	Quail Hollow Rd	Eduardo Ave	2,900
Kessler Dr	Marion Ave	End	520
Kessler Way	Kessler Dr	End	250
Marion Ct	Marion Ave	End	180
Eduardo Ave	Pedro Ave	End	750
Arenosa Ln	Eduardo Ave	End	300
Pedro Ave	Eduardo Ave	Rancho Rio Ave	400
Rancho Rio Ave	Pedro Ave	Newell Creek Rd	1,940
Hallsons Ln	Rancho Rio Rd	End	550
Hart Ln	Rancho Rio Rd	End	660
Newell Creek Rd	Glen Arbor Rd	End of line	3,500
Larita Dr	Quail Hollow Rd	Eleana Dr	2,380
Clement St	Hihn Rd	Larita Dr	180
Morningside Dr	Larita Dr	Eleana Dr	830
Woodston Way	Morningside Dr	End	620
Archer Way	Larita Dr	Eleana Dr	450
Eleana Dr	Larita Dr	End	1,340
Baumert Ln	Eleana Dr	End	330
Shande Ln	Eleana Dr	End	200
Glen Arbor Rd	Newell Creek Rd	Quail Hollow Rd	2,380
Hihn Rd	Glen Arbor Rd	Crown Dr	4,400
Crown Dr	Hihn Rd	End of line	440
Stanford Dr	Hihn Rd	End	420
Harvard Dr	Stanford Dr	End	1,430
Ridgeview Dr	Hihn Rd	End	1,080
Condor Ave	Hihn Rd	Azalea Ave	380
Melin Ave	Condor Ave	End	1,040
Azalea Ave	Condor Ave	Cook Way	2,020

Glen Arbor Rd	Quail Hollow Rd	Fernwood Ave	3,100
Cook Way	Glen Arbor Rd	Azalea Ave	370
Caledonium Ave	Glen Arbor Rd	End	560
Balch Way	Condor Ave	End	600
Condor Ave	Balch Way	End	1,640
Schaaf Rd	Glen Arbor Rd	Oak Ave	460
Oak Ave	Schaaf Rd	Fernwood Ave	600
Fernwood Ave	Oak Ave	End	450
Hermosa Ave	Oak Ave	End	1,500
Arden Ave	Glen Arbor Rd	Hermosa Ave	800
Lorenzo Way	Glen Arbor Rd	End	2,000
Fremont Ave	Arden Ave	End	300
Fremont Ave	Oak Ave	End	560
Glen Arbor Rd	Newell Creek Rd	Brookside Ave	2,620
Maple Ave	Glen Arbor Rd	End	900
Madrone Ave	Glen Arbor Rd	Riverside Ave	930
Railroad Dr	Madrone Ave	End of line	450
Oak Ave	Railroad Dr	Madrone Ave	530
Riverside Park Dr	Oak Ave	End	550
Alder Ave	Riverside Park Dr	End	150
Riverside Dr	Brookside Ave	Wente St	2,340
Wente St	Riverside Ave	Dickinson Ave	300
Dickinson Ave	Wente St	End	380
Hillcrest Ave	Glen Arbor Rd	End	630
Circle Dr	Hillcrest Ave	Manzanita Ave	1,240
Manzanita Ave	Circle Dr	Whittier Ave	2,340
Locust St	Glen Arbor Rd	Sund Ave	650
Sund Ave	Locust St	End	200
Pine St	Glen Arbor Rd	Manzanita Ave	420
El Solyo Ave	Manzanita Ave	End	780
Whittier Ave	Manzanita Ave	End	650
Live Oak Ave	Glen Arbor Rd	Brookside Ave	800
Brookside Ave	Glen Arbor Rd	Love Creek Rd	2,370
Glen Arbor Rd	Brookside Ave	Hwy 9	500
Brookside Ct	Brookside Ave	End	240
Kipling Ave	Brookside Ave	End	1,040
Longfellow Ave	Kipling Ave	End	360
Estates Dr	Brookside Ave	End	1,260
Love Creek Rd	Roberts Rd	Hwy 9	3,500
Berts Rd	Love Creek Rd	End	1,040
Sunnyside Ave	Love Creek Rd	North St	1,280
North St	Sunnyside Ave	End	1,850
Central Ave	Love Creek Rd	Fairview Ave	1,020
Main St	Sunnyside Ave	Mill St	1,250
Fairview Ave	Sunnyside Ave	Central Ave	430
Fillmore Ave	Central Ave	Hwy 9	450
Mill St	Hwy 9	Hwy 9	1,100
Glen Lomond Ln	Hwy 9	End	230
Brackney St	Hwy 9	End	1,900
Bridge St	Brackney St	Cottage Ave	380

Cottage Ave	Bridge St	End	660
Sunnycroft Rd	Hwy 9	End	1,260
Fremont Ave	Sunnycroft Rd	End	220
Locust Ln	Hwy 9	End	950
Hunt Way	Locust Ln	End	460
Willowbrook Dr	Hwy 9	End	650
Redwood Ln	Willowbrook Dr	Coon Heights Rd	280
Coon Heights Rd	Hwy 9	Redwood Ln	550
Park Ave	Hwy 9	McPherson Ave	3,130
Crest Dr	Park Dr	End	460
Valley View Rd	Park Dr	End of line	1,500
Crossbow Way	Valley View Rd	Flintlock Ln	380
Fiddlesticks Way	Valley View Rd	End of line	790
Flintlock Ln	Valley View Rd	End	1,300
McPherson Ave	Park Dr	End	630
Graham Hill Rd	Hwy 9	Covered Bridge Rd	1,372
Hwy 9	Tollhouse Rv Park	Lomond St	41,712
Hwy 9	Lomond St	Celia Ln	27,984
Bear Creek Rd	Hwy 9	Bear Creek Wastewater Plant	12,672
E Zayante Rd	Quail Hollow Rd	E Creek Rd	12,672
Lomond St	East Of Hwy 9	West of Laurel St	1,108
Lockewood Ln	Graham Hill Rd	Mt Herman Rd	5,000
Scenic Way	Hwy 9	Country Club Dr	890
Greenbank Dr	Scenic Way	End of line	1,261
Park Dr	Scenic Way	McPherson Ave	497
McPherson Ave	Park Dr	End of line	668
Mountain View Dr	Scenic Way	Woodland Dr	762
Dundee Ave	Country Club Dr	Jackson Ave	870
Jackson Ave	Country Club Dr	Dundee Ave	1,427
Woodland Dr	Country Club Dr	End of line	460
Hill Crest Dr	Scenic Way	Greenfield St	605
Greenfield St	Hill Crest Dr	Park Way	247
Forest Ave	Scenic Way	Greenbank Dr	793
Sylvia Way	Scenic Way	Shafer Ave	402
Ayre Terr	Country Club Dr	End of line	287
Madrone Way	Scenic Way	End of line	400
Calidonium Ave	Country Club Dr	Calidonium Ave	568
Raccoon Ln	Greenbank Dr	End of line	223
Woodland Dr	Hwy 9	End of line	409
Rowardennan Dr	Hwy 9	Redwood Dr	345
Lorenzo Ave	Hwy 9	Woodland Dr	678
Woodland Dr	Lorenzo Ave	Redwood Dr	932
Madrona Way	Lorenzo Ave	Redwood Dr	731
Redwood Dr	Woodland Dr	Madrona Way	197
Woodland Dr	Hwy 9	Woodland Dr	436
Redwood Dr	Lorenzo Ave	Rowardennan Dr	372
Hillside Ave	Hwy 9	End of line	1,055
Old County Rd	Hwy 9	End of line	1,048
Alba Rd	Hwy 9	End of line	700
Brown Gables Rd	Hwy 9	Riverside Dr	700

Beverly Dr	Hwy 9	Riverside Dr	630
Riverside Dr	California Dr	End of Riverside Dr	1,517
California Dr	Riverside Dr	Middle Dr	1,275
Larkspur St	Hwy 9	Annies Way	1,297
Riverside Dr	Annies Way	Fern St	607
Fern St	Riverside Dr	River Rd	442
River Rd	Fern St	Riverside Dr	3,506
Redwood St	Alder St	Fern St	539
Hazel St	Riverside Dr	River Rd	456
Annies Way	Riverside Dr	River Rd	429
Wester Ave	Hwy 9	High St	248
High St	Western Ave	End of line	824
Forest Way	High St	End of line	1,453
Wester Ave	Forest Way	End of line	1,065
2" line	High St	Forest Way	291
Clear Creek Rd	Hwy 9	End of line	2,897
High St	Clear Creek Rd	End of line	1,217
Old River Rd	Larkspur St	End of line	1,162
Alameda Ave	Hwy 9	Center St	200
Center St	Reed St	Larkspur Ave	1,353
1" ST	Hwy 9	Berkeley Way	1,112
Cascade St	Hwy 9	End of line	585
Reed St	Hwy 9	End of line	722
Pacific St	Hwy 9	End of line	803
Huckleberry Island	12" transmission	End of line	1,563
Monan Way	Alta Via	Prospect Ave	600
Alta Via	Hwy 9	Prospect Ave	1,200
Alta Via	Monan Way	Clear Creek Rd	2,771
Debbie Ct	Debbie Dr	End of line	350
Debbie Dr	Fairmont Dr	Fairmont Dr	972
Fairmount Dr	119 Fairmont Dr	Nina Ct	2,050
Highland Dr	Fairmount Dr	End of line	3,000
Fawn Ct	Nina Dr	End of line	250
Nina Dr	Highland Dr	Elsie Mae Dr	1,931
Nina Ct	Nina Dr	End of line	400
Elsie Mae Dr	Rebecca Dr	End of line	1,412
Daisy Pl	Rebecca Dr	End of line	284
Rebecca Dr	Nina Reservoirs	End of line	2,927
Irwin Way	Hwy 9	Fairmount Dr	2,563
Camp Joy Rd	Irwin Way	End of line	1,137
Alameda Ave	Hwy 9	Clear Creek Rd	828
Irwin Way	Fairmount Dr	Lomond St	3,932
Aquila Way	Redwood Way	End of line	200
Redwood Way	Irwin Way	End of line	600
Fairview Ave	Irwin Way	Highland Dr	3,134
Madrone Ave	Fairview Ave	End of line	280
Highland Dr	Fairview Ave	End of line	300
Middleton Ave	Lomond St	Hwy 9	1,007
Junction St	Middleton Ave	Lomond St	494
Railroad Ave	Middleton Ave	Lomond St	710

Lomond St	Hwy 9	Irwin Way	1,326
Pine St	Hwy 236	Harmon St	1,327
Oak St	Hwy 236	Harmon St	1,297
Laurel St	Hwy 236	Lomond St	564
Forest St	Lomond St	Pine St	522
2" ST	Lomond St	End of line	500
Hillside Terr	Harmon St	Flat St	674
Boulder St	Harmon St	Perry Ln	1,940
Mountain St	Hillside Terr	East St	905
Lorenzo Ave	Hwy 9	Grove St	1,678
Grove St	Boulder St	End of line	1,129
Perry Ln	Boulder St	End of line	300
River St	Hwy 9	End of line	738
East St	Grove St	End of line	300
Total Area Surveyed in Feet			**528,308**
Total Area Surveyed in Miles			**100.0583**

A detailed report of decibel levels at suspected leak sound locations and observations were compiled during the survey for reinvestigation and possible pinpointing at a later time. This reinvestigation increased the speed of the survey and eliminated correlating on most false leak sounds.

Leak Type Noises Detected

Contact Points	Noises Detected
Hydrant	6
Valves	24
Services	37
Other	6
Total	**73**

All indications of leaks found during the survey were verified a second time, after which, the leaks were pinpointed with a computer based sound correlator when possible. Pinpointing information can be found in the Pinpointing and Leak Reports Sections.

End of Section

PINPOINTING PHASE REVIEW

PINPOINTING PHASE REVIEW
(Water Distribution Lines)

All indications of leaks found during the survey were verified a second time, after which, the leaks were pinpointed with a computer based sound correlator when possible. Pinpointing leak locations through interpretation of sound intensity, either by ear, decibel metering or other like methods was not used when contact points were available for use with the correlator. However, ground listening devises were used as a quick double check on pinpointed leaks.

The equipment used did not normally require valves to be operated during surveying and pinpointing. However, on occasion, services or valves were operated to eliminate service draw noises or to change velocity noise.

The correlator equipment used had the capability to prompt the operator to input the variables when different pipe sizes and/or pipe material were encountered in the same span to be investigated. This is necessary to insure accuracy of results based on the automatic computation of the correct leak sound velocity in leak pinpointing operations. Our correlators have the capability of correlating up to seven various pipe sizes and types at one time in a given space. To insure effective performance in all field environments encountered in the distribution system (i.e. traffic noise, draw, pump operation, industrial noise, etc.), the correlator equipment provides 16 auto filter options and/or infinite manual filter options.

We provided a copy of leak reports, when pinpointed, which included leak locations and estimated GPM loss.

Leaks Pinpointed

Number	Leak Type	Location	GPM
1	Main	10121 E Zayante Rd	25.00
2	Main	10121 E Zayante Rd	25.00
3	Hydrant	10621 Visitar St	2.00
4	Service Line	104 Beth Dr	0.50
5	Valve	Lincoln Way & San Lorenzo Ave	1.00
6	Main	West of 949 Brookside Way	5.00
7	Service Line	201 Hihn St	2.00
8	Main	Near 400 Farmer St	5.00
9	Service Line	140 Riverside Ave	2.00
10	Service Line	212 Riverside Park Dr	2.00
11	Service Line	260 Riverside Park Dr	3.00
12	Main	9795 Central Ave	5.00
13	Main	190 Willowbrook Dr	10.00
14	Hydrant	Hwy 9 & Graham Hill Rd	0.10
15	Meter	6630 Hwy 9	0.10
16	Curb Stop	6706 Hwy 9	0.10
17	Valve	Riverdale Blvd & Hwy 9	0.25
18	Main	7604 Hwy 9	5.00
19	Main	Glen Arbor Rd & Hwy 9	5.00
20	Main	11247 Hwy 9	1.00
21	Service Connection	11790 Hwy 9	1.00
22	Main	Grove St & Hwy 9	2.00
23	Valve	125 Forest St	10.00

24	Valve	Hwy 236 & Hwy 9	0.50
25	Main	Juanita Rd & Hwy 9	0.10
26	Main	Lorenzo Ln & Hwy 9	0.50
27	Main	15610 Hwy 9	2.00
28	Other	Bear Creek Rd & Harmon Gulch Rd	0.10
29	Main	E Zayante Rd & Waner Way (On Bridge)	0.50
30	Service Line	9579 Mill St	0.50
31	Meter	10990 Riverside Rd	0.10
32	Main	1240 Dundee Ave	0.25
33	Main	1545 Jackson Ave	1.00
34	Valve	Country Club Dr & Jackson Ave	1.00
35	Curb Stop	11020 Redwood St	0.10
36	Main	300 Old River Ln	5.00
37	Main	145 Pacific St	0.50
38	Main	13330 Irwin Way	2.00
39	Main	13181 Laurel St	1.00
40	Curb Stop	10820 Westwood Rd	1.00
Total			**128.20**

These leak reports, also included a leak repair priority classification. These classifications are as follows:

Class I Any leak which is hazardous in terms of potential undermining, possibly resulting in surface collapse, encroachment and/or damage to nearby utilities, commercial or private properties or leaks severe enough to warrant immediate repair.

Class II All leaks that display water losses significant enough to be monitored on a regular repair schedule.

Class III Relatively small leaks that should be repaired as workload permits.

Repair Priority

Number	Leak Type	Location	GPM
1	Main	10121 E Zayante Rd	25.00
2	Main	10121 E Zayante Rd	25.00
19	Main	Glen Arbor Rd & Hwy 9	5.00
23	Valve	125 Forest St	10.00
36	Main	300 Old River Ln	5.00
Total Class I			**70.00**

Number	Leak Type	Location	GPM
3	Hydrant	10621 Visitar St	2.00
5	Valve	Lincoln Way & San Lorenzo Ave	1.00
6	Main	West of 949 Brookside Way	5.00
7	Service Line	201 Hihn St	2.00
8	Main	Near 400 Farmer St	5.00
9	Service Line	140 Riverside Ave	2.00
10	Service Line	212 Riverside Park Dr	2.00
11	Service Line	260 Riverside Park Dr	3.00
12	Main	9795 Central Ave	5.00
13	Main	190 Willowbrook Dr	10.00

18	Main	7604 Hwy 9	5.00
20	Main	11247 Hwy 9	1.00
21	Service Connection	11790 Hwy 9	1.00
22	Main	Grove St & Hwy 9	2.00
25	Main	Juanita Rd & Hwy 9	0.10
26	Main	Lorenzo Ln & Hwy 9	0.50
27	Main	15610 Hwy 9	2.00
29	Main	E Zayante Rd & Waner Way (On Bridge)	0.50
30	Service Line	9579 Mill St	0.50
32	Main	1240 Dundee Ave	0.25
33	Main	1545 Jackson Ave	1.00
34	Valve	Country Club Dr & Jackson Ave	1.00
37	Main	145 Pacific St	0.50
38	Main	13330 Irwin Way	2.00
39	Main	13181 Laurel St	1.00
40	Curb Stop	10820 Westwood Rd	1.00
Total Class II			**56.35**

Number	Leak Type	Location	GPM
4	Service Line	104 Beth Dr	0.50
14	Hydrant	Hwy 9 & Graham Hill Rd	0.10
15	Meter	6630 Hwy 9	0.10
16	Curb Stop	6706 Hwy 9	0.10
17	Valve	Riverdale Blvd & Hwy 9	0.25
24	Valve	Hwy 236 & Hwy 9	0.50
28	Other	Bear Creek Rd & Harmon Gulch Rd	0.10
31	Meter	10990 Riverside Rd	0.10
35	Curb Stop	11020 Redwood St	0.10
Total Class III			**1.85**

Whenever any of the leaks detected by USA were repaired prior to completion of the field work, we gave San Lorenzo Valley Water District the option to have that section of the system re-surveyed to be sure no very quiet leaks were missed due to an over powering noisy leak sound.

Please note that leakage that was detected and pinpointed may be larger or smaller than estimated. Estimates are based on several variables including type and size of pipe, pressure and interpretation of correlation filter results.

It should be noted that we have listed one area as "Undefined". This is an area where we believe one or more leaks exist, however, after spending considerable time at each location, we could not pinpoint the suspect leakage. This may be due to one or more of many different variables including; poor sound travel, limited number of appurtenances, etc. For further information and/or assistance, please contact our main office.

Undefined Leaks

Leak Location	Notes
Near 675 Condor Ave	Leak present in area. Correlations pinpointed to different spots depending on the filters applied. No noise was detected through ground mic inspection and probe rod sounding yielded slight noise near the meter but no moisture anywhere. Recommend probing the area for moisture, and if none is detected, monitoring the area for any changes. If nothing changes or develops in the area, the location should be re-surveyed the next time the system is surveyed.

In addition, we identified two possible consumer side leaks. Although pinpointing consumer side leaks was not part of the scope of this project, we have listed it below as a courtesy.

Possible Consumer Side Leaks

Leak Location	Notes
5309 McKinley Ave	Possible consumer side leak at 5309 McKinley Ave.
165 Condor Ave.	Possible consumer side leak at165 Condor Ave.

End of Section

LEAK REPORTS

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	1
Date:	October 5, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
MAIN
Leak Address
10121 E ZAYANTE RD

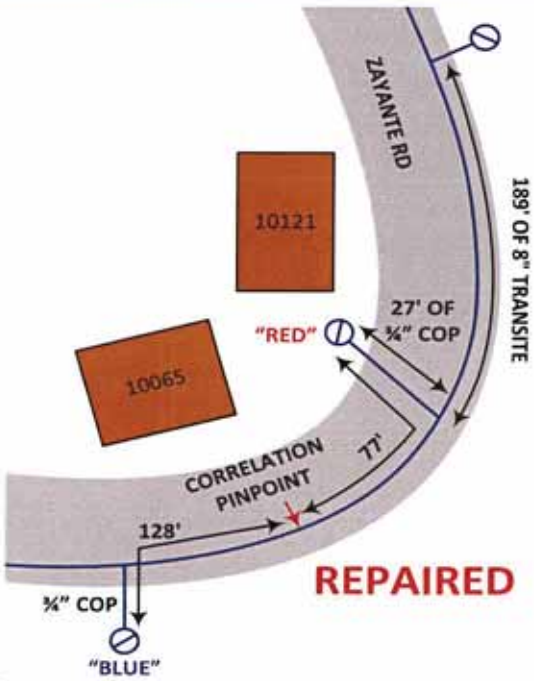
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LARGE LEAK PRESENT ON MAIN. RAN MULTIPLE CORRELATIONS AND MARKED CORRELATION PINPOINT. GROUND MIC INSPECTION YIELDED SOLID LEAK NOISE ON AN OVER 200' SPAN. LINE WAS EXPOSED AT CORRELATION PINPOINT FINDING A COUPLING THAT HAD BOTH PIPE ENDS PULLED OUT A FEW INCHES. A 25 GPM LEAK WAS LOCATED 13' AWAY AT THE NEXT PIPE COUPLER EAST OF THE PINPOINT. ISSUE HAS BEEN REPAIRED AND NO ADDITIONAL LEAK WAS DETECTED. SEEE LEAK REPORT #2 FOR SECOND LEAK DATA.

Action(s) Taken:	VERIFIED WITH MULTIPLE SETUPS	LEAK REPAIRED
Recommendation(s):	EXCAVATE & REPAIR	RESURVEY FOLLOWING REPAIRS

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LD-12
PROBE ROD

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	I
Leak Rate (GPM):	25.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	90

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
100	A	29	188
200	A	77	128

Water Loss (gallons)	
Daily:	36,000
Weekly:	252,000
Monthly:	1,095,000
Annual:	13,140,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	2
Date:	October 5, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

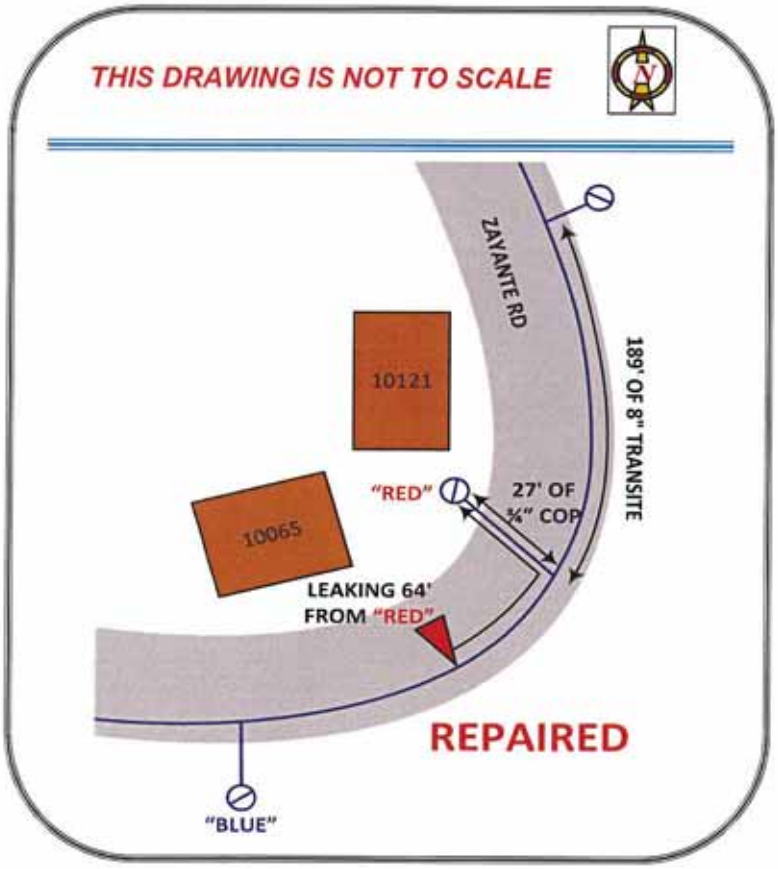
Leak Type
MAIN
Leak Address
10121 E ZAYANTE RD

Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

THIS LEAK WAS FOUND 64' FROM METER ON 10/21/2018 AND HAS BEEN REPAIRED.

Action(s) Taken:	VERIFIED WITH MULTIPLE SETUPS	LEAK REPAIRED
Recommendation(s):	EXCAVATE & REPAIR	RESURVEY FOLLOWING REPAIRS



EQUIPMENT USED
S-30
LD-12

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	I
Leak Rate (GPM):	25.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	90

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	36,000
Weekly:	252,000
Monthly:	1,095,000
Annual:	13,140,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	3
Date:	October 5, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
HYDRANT
Leak Address
10621 VISITOR ST

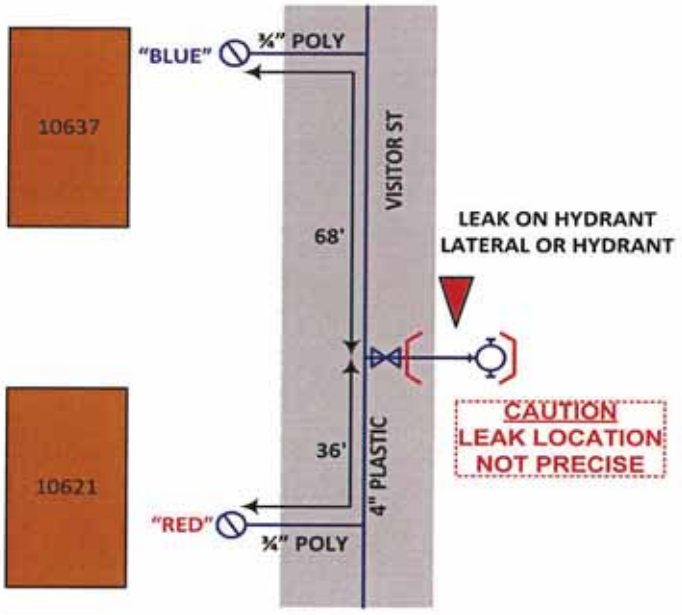
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON DRYSTACK HYDRANT OR LATERAL. VALVED OFF HYDRANT LATERAL BUT COULD NOT GET VALVE TO FULLY SHUT. RAN CORRELATION ON MAIN PINPOINTING TO VALVE FOR HYDRANT LATERAL. RECOMMEND EXPOSING THE LATERAL AT THE HYDRANT.

Action(s) Taken:	ISOLATED TO ELIMINATE FLOW	HYDRANT FLUSHED - STILL LEAKING
Recommendation(s):	REPAIR / REPLACE	

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LD-12

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	2.00
Cover Type:	GRAVEL
Site Marked:	YES
Mins. Pinpointing:	45

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
100	A	36	68

Water Loss (gallons)	
Daily:	2,880
Weekly:	20,160
Monthly:	87,600
Annual:	1,051,200

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	4
Date:	October 5, 2018
Map #:	
Coordinates	
37.0389575 N, 122.0869590 W	

Leak Type
SERVICE LINE
Leak Address
104 BETH DR

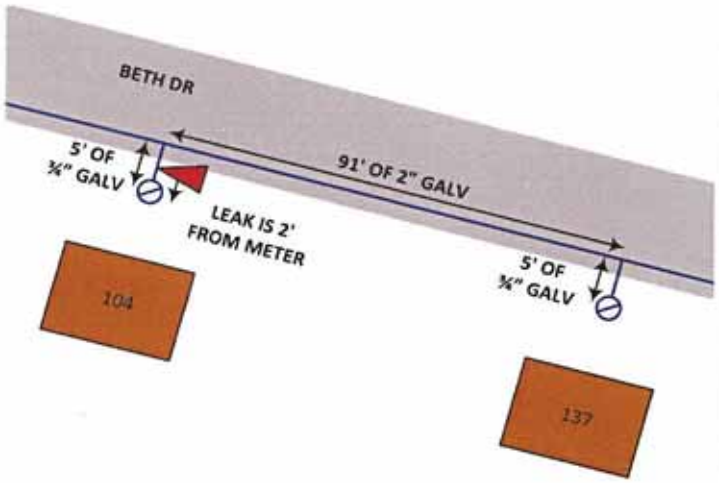
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

SMALL LEAK ON SERVICE NEAR METER BOX. LOCATED ISSUE THROUGH CORRELATION AND PROBE ROD SOUNDING. RECOMMEND PROBING FOR MOISTURE IN AREA.

Action(s) Taken: ISOLATED TO ELIMINATE FLOW
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LD-12
PROBE ROD

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	III
Leak Rate (GPM):	0.50
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
100	A	91	2

Water Loss (gallons)	
Daily:	720
Weekly:	5,040
Monthly:	21,900
Annual:	262,800

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	5
Date:	October 5, 2018
Map #:	
Coordinates	
37.0411244 N, 122.0741879 W	

Leak Type
VALVE
Leak Address
LINCOLN WAY & SAN LORENZO AVE

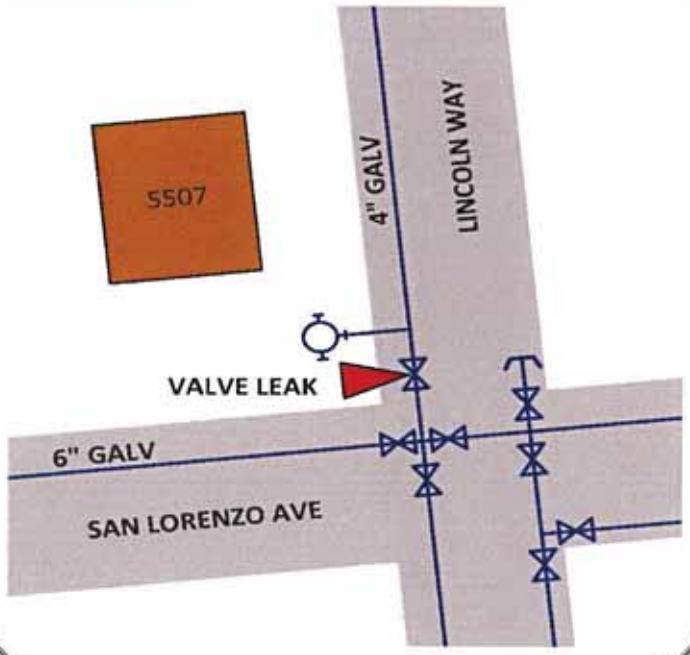
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON VALVE BODY OR PACKING FOR VALVE AT LINCOLN WAY AND SAN LORENZO AVE.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	1.00
Cover Type:	ASPHALT
Site Marked:	NO
Mins. Pinpointing:	45

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	1,440
Weekly:	10,080
Monthly:	43,800
Annual:	525,600

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	6
Date:	October 5, 2018
Map #:	
Coordinates	
N/A	

Leak Type
MAIN
Leak Address
WEST OF 949 BROOKSIDE WAY

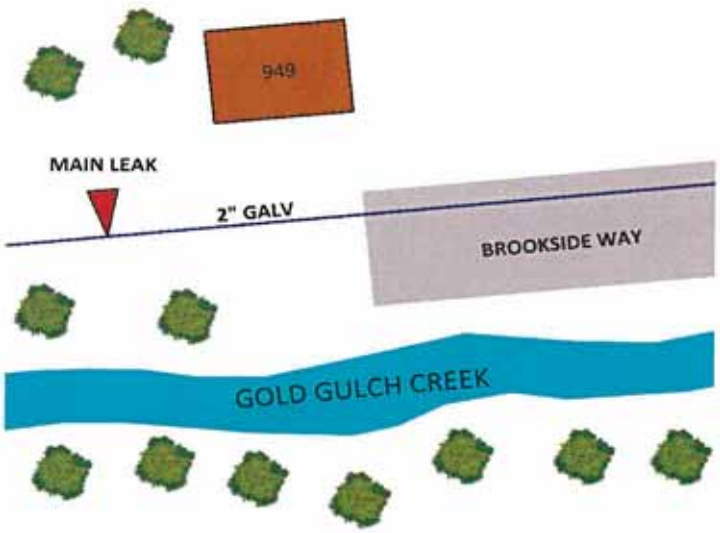
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON MAIN. CORRELATION WASN'T POSSIBLE DUE TO TERRAIN AND NO ABILITY TO ACCURATELY MEASURE THE LINE. LOCATED LEAK THROUGH PROBE ROD SOUNDING. WATER IS SURFACING AT POINT OF STRONGEST NOISE LOCATION. DON AND JOE ARE AWARE OF LOCATION.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
PROBE ROD

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	5.00
Cover Type:	SOIL
Site Marked:	NO
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	7,200
Weekly:	50,400
Monthly:	219,000
Annual:	2,628,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	7
Date:	October 11, 2018
Map #:	
Coordinates	
37.0494363 N, 122.0742485 W	

Leak Type
SERVICE LINE
Leak Address
201 HIHN ST

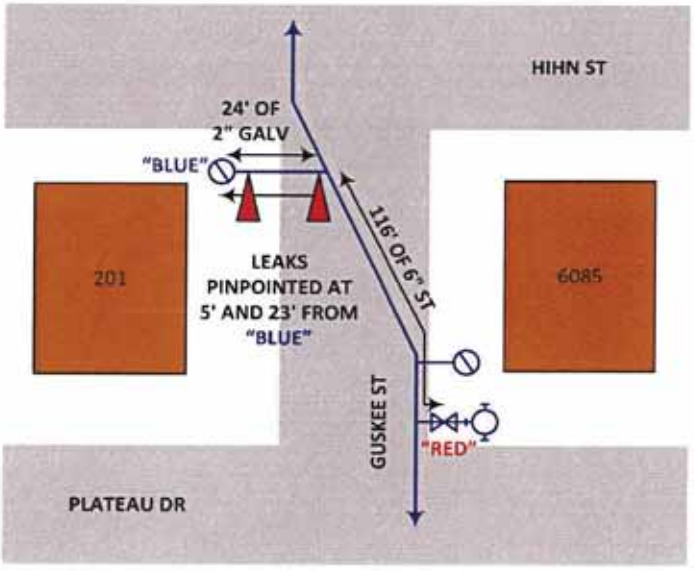
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON SERVICE LINE. NO NOISE WAS DETECTABLE THROUGH GROUND MIC SOUNDING AND TWO DIFFERENT PINPOINT LOCATIONS WERE DETECTED THROUGH CORRELATION DEPENDING ON FILTER SETTINGS. MARKED BOTH LOCATIONS AND RECOMMEND PROBING FOR MOISTURE BEFORE OPENING FOR REPAIRS.

Action(s) Taken: ISOLATED TO ELIMINATE FLOW
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LD-12

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	2.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
200	A	134	6
200	A	117	23

Water Loss (gallons)	
Daily:	2,880
Weekly:	20,160
Monthly:	87,600
Annual:	1,051,200

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	8
Date:	October 11, 2018
Map #:	
Coordinates	
37.0725142 N, 122.0859622 W	

Leak Type
MAIN
Leak Address
NEAR 400 FARMER ST

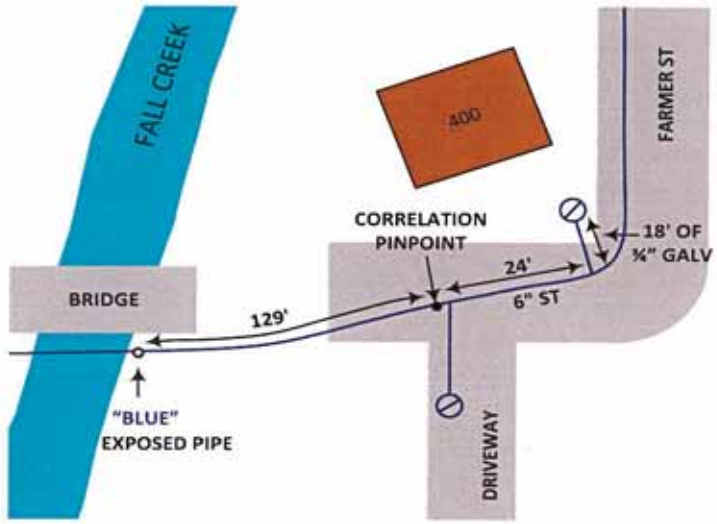
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON MAIN. ONLY ONE CORRELATION OPTION WAS AVAILABLE. THE CORRELATION PINPOINT WAS MARKED. GROUND MIC INSPECTION YIELDED A PINPOINT NOISE IN A DIFFERENT LOCATION. AREA OF GROUND MIC NOISE WAS MARKED AS WELL. RECOMMEND PROBING FOR MOISTURE AT ALL MARKED LOCATIONS BEFORE EXPOSING. THERE IS ALSO A SMALL LEAK PRESENT AT THE CURB STOP FOR 400 FARMER ST.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LD-12
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	5.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
200	A	42	129

Water Loss (gallons)	
Daily:	7,200
Weekly:	50,400
Monthly:	219,000
Annual:	2,628,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	9
Date:	October 11, 2018
Map #:	
Coordinates	
37.0725142 N, 122.0859622 W	

Leak Type
SERVICE LINE
Leak Address
140 RIVERSIDE AVE

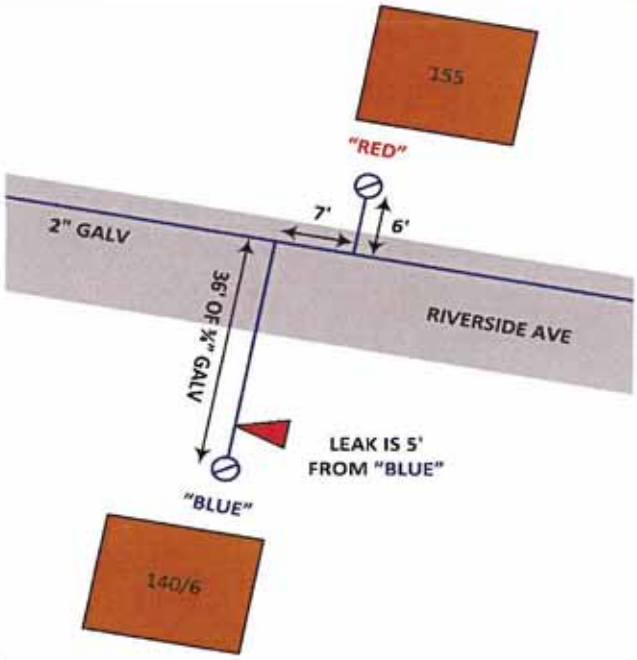
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON SERVICE LINE. VERIFIED LOCATION THROUGH CORRELATION AND GROUND MIC SOUNDING.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LD-12
PROBE ROD

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	2.00
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
100	A	44	5

Water Loss (gallons)	
Daily:	2,880
Weekly:	20,160
Monthly:	87,600
Annual:	1,051,200

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	10
Date:	October 11, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
SERVICE LINE
Leak Address
212 RIVERSIDE PARK DR

Client:	San Lorenzo Valley Water District

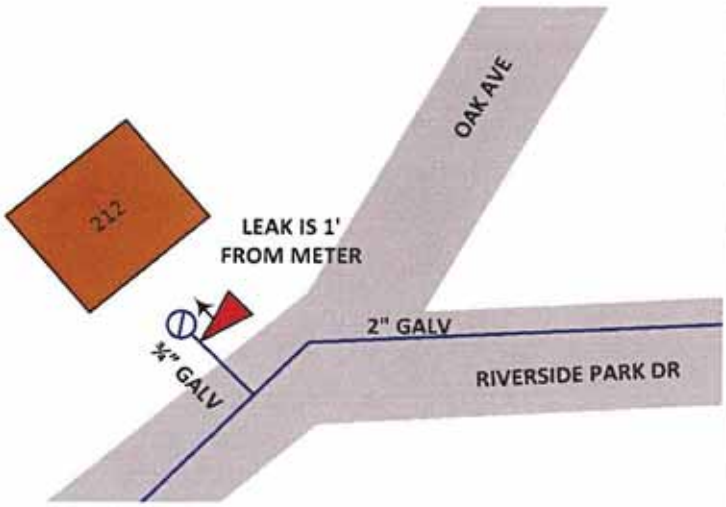
Agreement:	18259

REMARKS

LEAK ON SERVICE. CORRELATION WAS UNSUCCESSFUL. LEAK WAS LOCATED THROUGH GROUND MIC INSPECTION ABOUT 1' FROM THE METER BOX NEAR WHERE THE WATER IS SURFACING.

Action(s) Taken: ISOLATED TO ELIMINATE FLOW
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LD-12

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	2.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	45

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	2,880
Weekly:	20,160
Monthly:	87,600
Annual:	1,051,200

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	11
Date:	October 11, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
SERVICE LINE
Leak Address
260 RIVERSIDE PARK DR

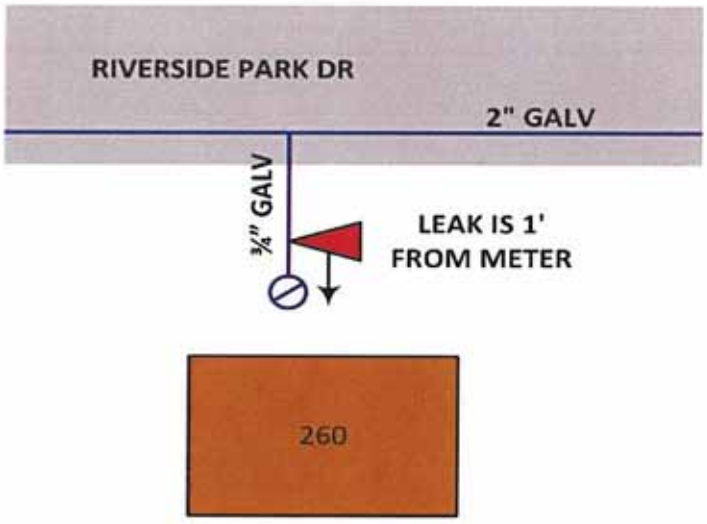
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON SERVICE. CORRELATION WAS UNSUCCESSFUL. LEAK WAS LOCATED THROUGH PROBE ROD SOUNDING AND GROUND MIC INSPECTION. STRONG LEAK NOISE AND VERY WET SOIL WAS DETECTED ABOUT 1' FROM METER BOX.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LD-12
PROBE ROD

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	3.00
Cover Type:	GRAVEL
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	4,320
Weekly:	30,240
Monthly:	131,400
Annual:	1,576,800

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	12
Date:	October 12, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
MAIN
Leak Address
9795 CENTRAL AVE

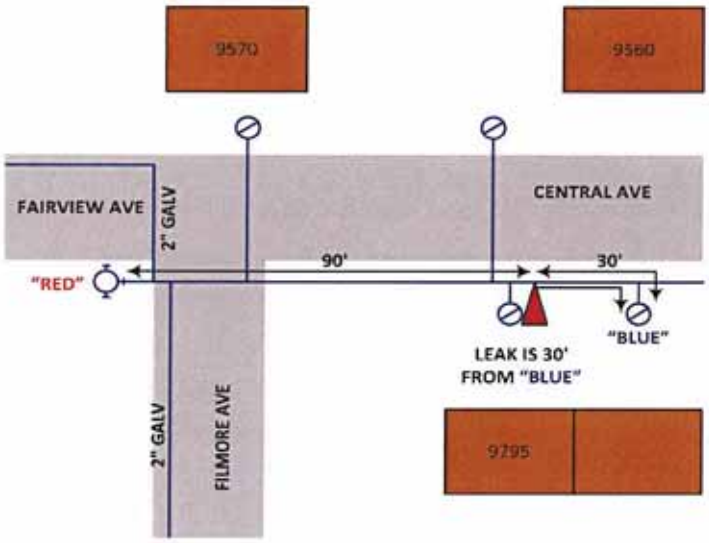
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON MAIN. VERIFIED LOCATION THROUGH CORRELATION AND PROBE ROD SOUNDING.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
PROBE ROD
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	5.00
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
200	A	90	30

Water Loss (gallons)	
Daily:	7,200
Weekly:	50,400
Monthly:	219,000
Annual:	2,628,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	13
Date:	October 12, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
MAIN
Leak Address
190 WILLOWBROOK DR

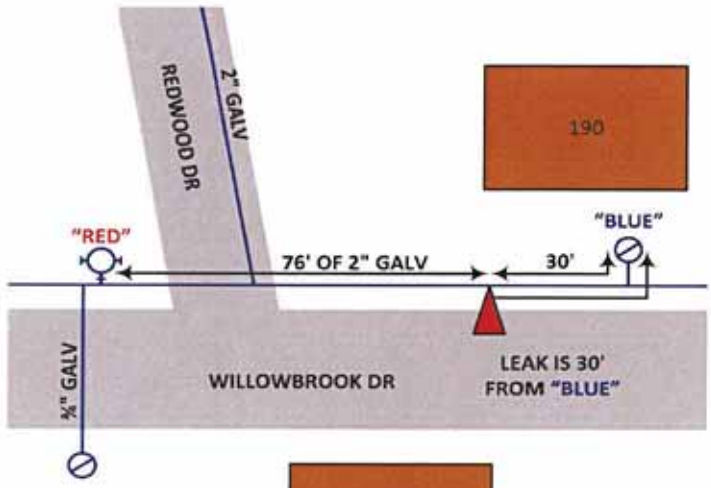
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON MAIN. VERIFIED LOCATION THROUGH CORRELATION AND GROUND MIC INSPECTION.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LD-12
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	10.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	45

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
100	A	76	30

Water Loss (gallons)	
Daily:	14,400
Weekly:	100,800
Monthly:	438,000
Annual:	5,256,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	14
Date:	November 5, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
HYDRANT
Leak Address
HWY 9 AND GRAHAM HILL RD

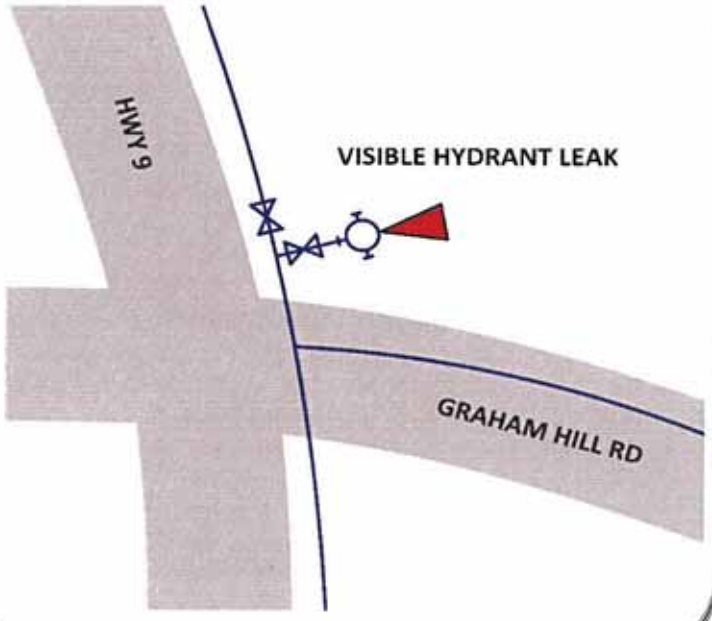
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

HYDRANT LEAK. VISIBLE LEAK AT TOP PORT. HYDRANT IS NOT MAKING NOISE.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	III
Leak Rate (GPM):	0.10
Cover Type:	SOIL
Site Marked:	NO
Mins. Pinpointing:	15

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	144
Weekly:	1,008
Monthly:	4,380
Annual:	52,560

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	15
Date:	November 5, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
METER
Leak Address
6630 HWY 9

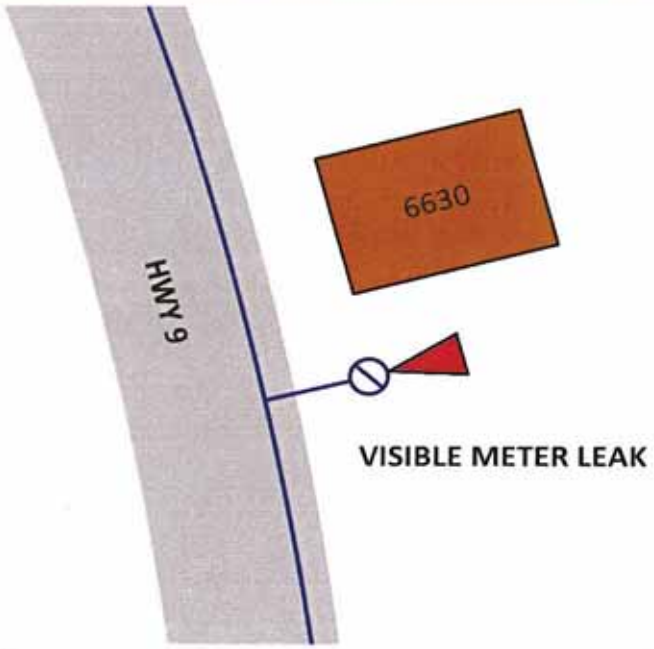
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

VISIBLE LEAK AT METER GASKET.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	III
Leak Rate (GPM):	0.10
Cover Type:	METER BOX OR VAULT
Site Marked:	NO
Mins. Pinpointing:	15

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	144
Weekly:	1,008
Monthly:	4,380
Annual:	52,560

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	16
Date:	November 5, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
CURB STOP
Leak Address
6706 HWY 9

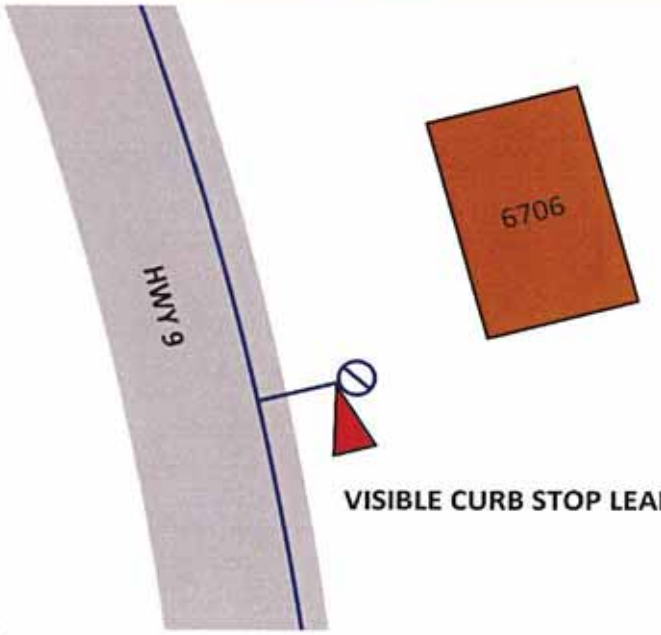
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

VISIBLE LEAK AT CURB STOP.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	III
Leak Rate (GPM):	0.10
Cover Type:	METER BOX OR VAULT
Site Marked:	NO
Mins. Pinpointing:	15

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	144
Weekly:	1,008
Monthly:	4,380
Annual:	52,560

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	17
Date:	November 5, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
VALVE
Leak Address
RIVERDALE BLVD AND HWY 9

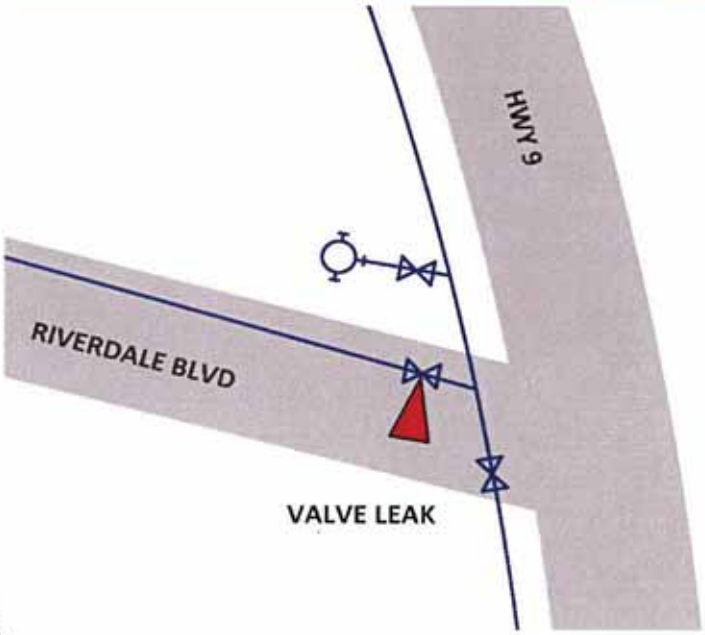
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK AT WHEEL VALVE. PUMPED OUT VALVE BOX AND WATER FILLS BOX. WHEEL VALVE IS BROKEN AND WAS NOT OPERATED. LEAK IS AUDIBLE WITHOUT LISTENING EQUIPMENT. ALL LEAK NOISE WAS ISOLATED TO LEAKING VALVE.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	III
Leak Rate (GPM):	0.25
Cover Type:	ASPHALT
Site Marked:	NO
Mins. Pinpointing:	20

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	360
Weekly:	2,520
Monthly:	10,950
Annual:	131,400

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	18
Date:	November 7, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
MAIN
Leak Address
7604 HWY 9

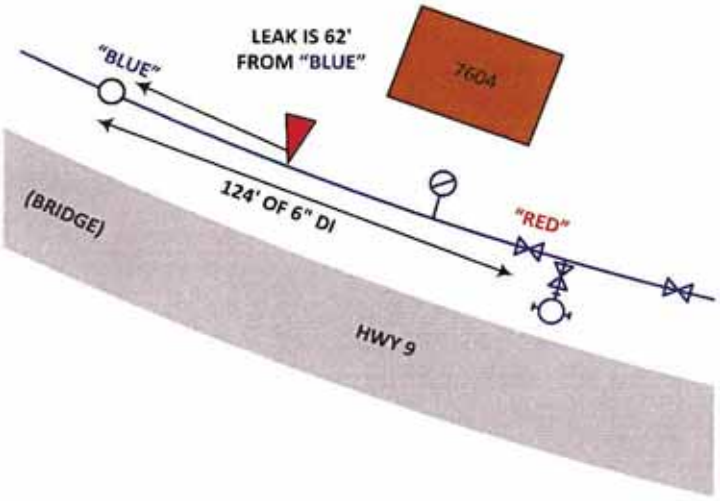
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

TWO GOOD CORRELATIONS 62' FROM "BLUE" (EXPOSED MAIN). CONFIRMED WITH GROUND MICROPHONE.

Action(s) Taken: VERIFIED WITH MULTIPLE SETUPS
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	5.00
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	45

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	62	62

Water Loss (gallons)	
Daily:	7,200
Weekly:	50,400
Monthly:	219,000
Annual:	2,628,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	19
Date:	November 7, 2018
Map #:	
Coordinates	
37.0938397 N, 122.0419792 W	

Leak Type
MAIN
Leak Address
GLEN ARBOR RD AND HWY 9

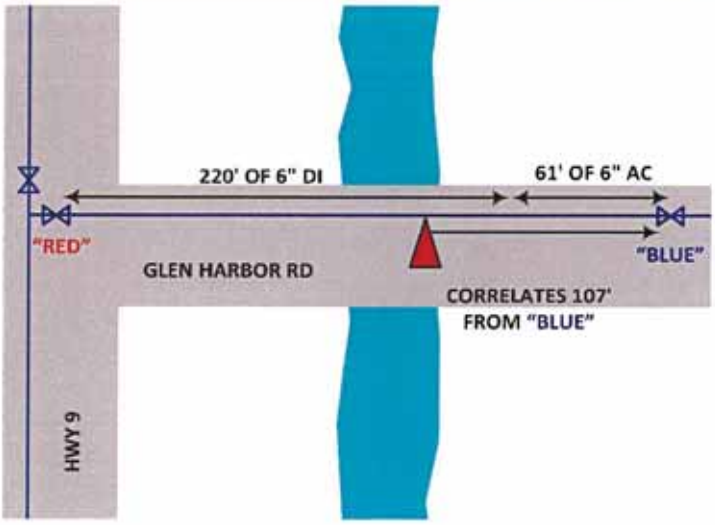
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

ONE GOOD CORRELATION 107' FROM "BLUE" (VALVE). COULD NOT CONFIRM WITH GROUND MICROPHONE. CONCRETE IS VERY THICK AND MAIN IS IN A HOLLOW TRENCH IN BRIDGE.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	I
Leak Rate (GPM):	5.00
Cover Type:	CONCRETE
Site Marked:	YES
Mins. Pinpointing:	75

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	220	107

Water Loss (gallons)	
Daily:	7,200
Weekly:	50,400
Monthly:	219,000
Annual:	2,628,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	20
Date:	November 7, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
MAIN
Leak Address
11247 HWY 9

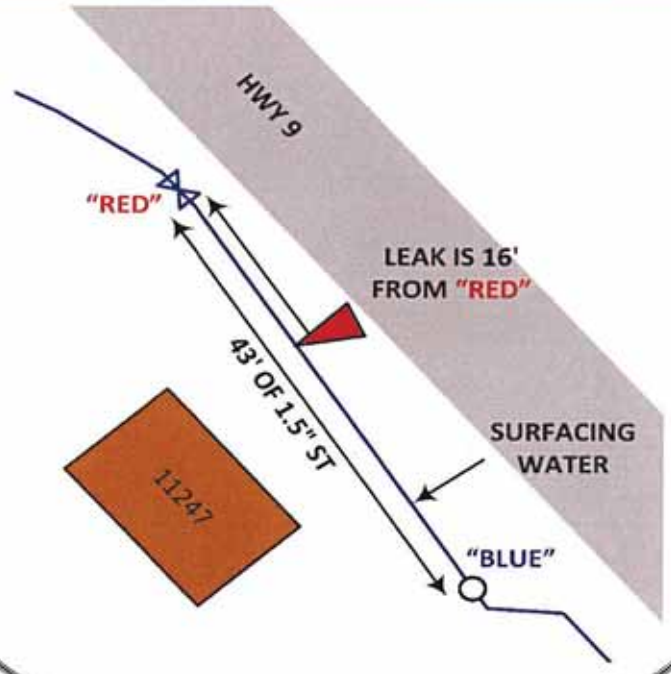
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

ONE GOOD CORRELATION 16' FROM "RED" (VALVE). LEAK NOISE CORRELATES TO WATER SURFACING FROM HILL. ABLE TO HEAR SLIGHT LEAK NOISE WITH PROBE ROD AND LISTENING DEVICE. THERE IS ALSO WATER SURFACING 31' FROM "RED". THERE WAS NO GROUND MICROPHONE NOISE HEARD AT THIS LOCATION. WE RECOMMEND REPLACING THIS SMALL SECTION OF STEEL PIPE.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500
PROBE ROD
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	1.00
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	16	27

Water Loss (gallons)	
Daily:	1,440
Weekly:	10,080
Monthly:	43,800
Annual:	525,600

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	21
Date:	November 7, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
SERVICE CONNECTION
Leak Address
11790 HWY 9

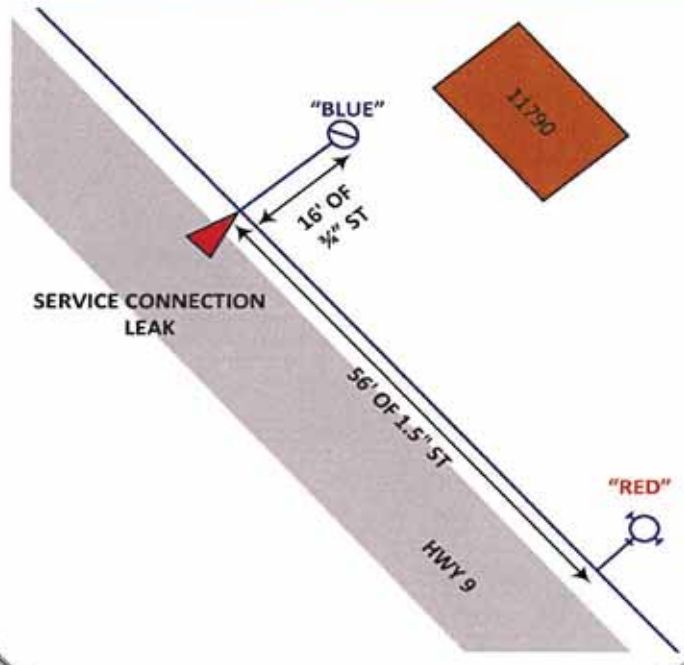
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

ONE GOOD CORRELATION 16' FROM "BLUE" (METER). CORRELATES TO SERVICE CONNECTION AREA. NO CORRELATIONS AVAILABLE FROM NW. GOOD GROUND MICROPHONE NOISE DETECTED 9-16' FROM METER. SERVICE CONNECTION AREA IS DIFFICULT TO PROBE DUE TO LARGE ROCKS. LEAK IS MOST LIKELY AT SERVICE CONNECTION.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500
PROBE ROD
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	1.00
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	45

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	56	16

Water Loss (gallons)	
Daily:	1,440
Weekly:	10,080
Monthly:	43,800
Annual:	525,600

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	22
Date:	November 7, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
MAIN
Leak Address
GROVE ST AND HWY 9

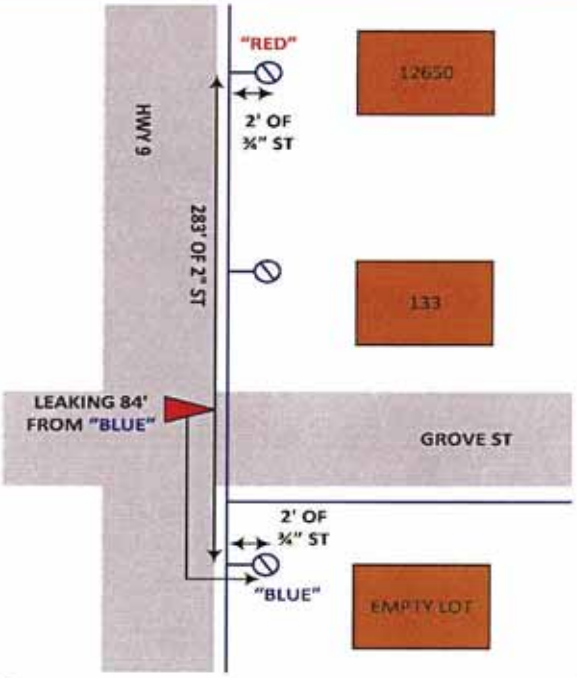
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

TWO GOOD CORRELATIONS. ONE 84' FROM "BLUE" (METER) AND THE OTHER 93' FROM "BLUE" (METER). GROUND MICROPHONE NOISE HEARD 84' FROM "BLUE".

Action(s) Taken: VERIFIED WITH MULTIPLE SETUPS
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	2.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	90

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	203	84

Water Loss (gallons)	
Daily:	2,880
Weekly:	20,160
Monthly:	87,600
Annual:	1,051,200

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	23
Date:	November 8, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
VALVE
Leak Address
125 FOREST ST

Client:	San Lorenzo Valley Water District

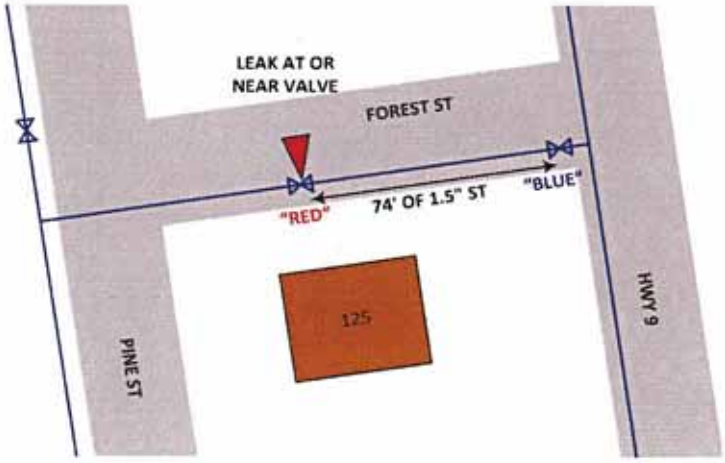
Agreement:	18259

REMARKS

ONE GOOD CORRELATION 2' FROM "RED" (VALVE). EXCELLENT GROUND MICROPHONE DETECTED 2' FROM "RED". WHEEL VALVE IS BROKEN. AUDIBLE LEAK NOISE CHANGES WHEN VALVE KEY IS TOUCHING VALVE. LEAK IS AT OR NEAR VALVE. UNABLE TO CONFIRM IF VALVE IS THROTTLED. USE CAUTION.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	I
Leak Rate (GPM):	10.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	2	72

Water Loss (gallons)	
Daily:	14,400
Weekly:	100,800
Monthly:	438,000
Annual:	5,256,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	24
Date:	November 8, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
VALVE
Leak Address
HWY 236 AND HWY 9

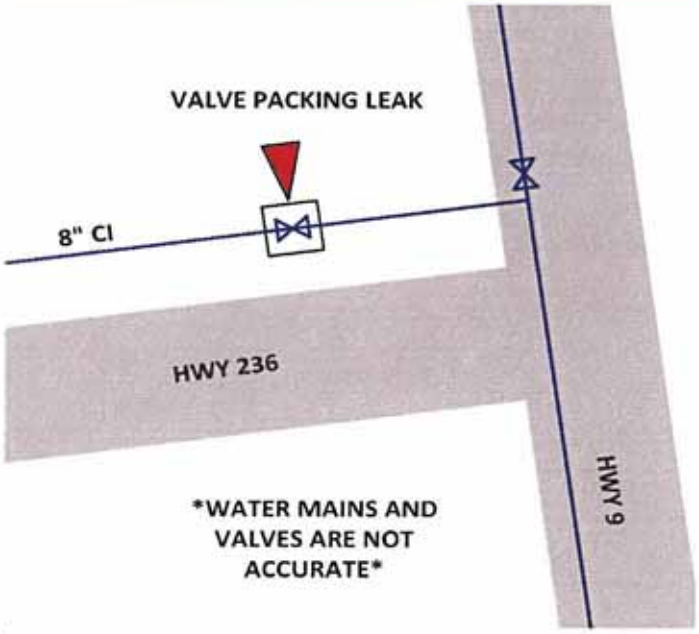
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

PACKING LEAK. LEAK WAS CREATED OR INCREASED WHEN VALVE WAS OPERATED. VALVE WAS THE LOUDEST NOISE DETECTED IN THE ENTIRE INTERSECTION AS THERE ARE NUMEROUS VALVES AND MAINS IN THE INTERSECTION. THERE IS ALSO A BOOSTER IN THE AREA. WE RECOMMEND REPAIRING THIS VALVE BEFORE MOVING FORWARD.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	III
Leak Rate (GPM):	0.50
Cover Type:	METER BOX OR VAULT
Site Marked:	NO
Mins. Pinpointing:	30

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	720
Weekly:	5,040
Monthly:	21,900
Annual:	262,800

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	25
Date:	November 8, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
MAIN
Leak Address
JUANITA RD AND HWY 9

Client:	San Lorenzo Valley Water District

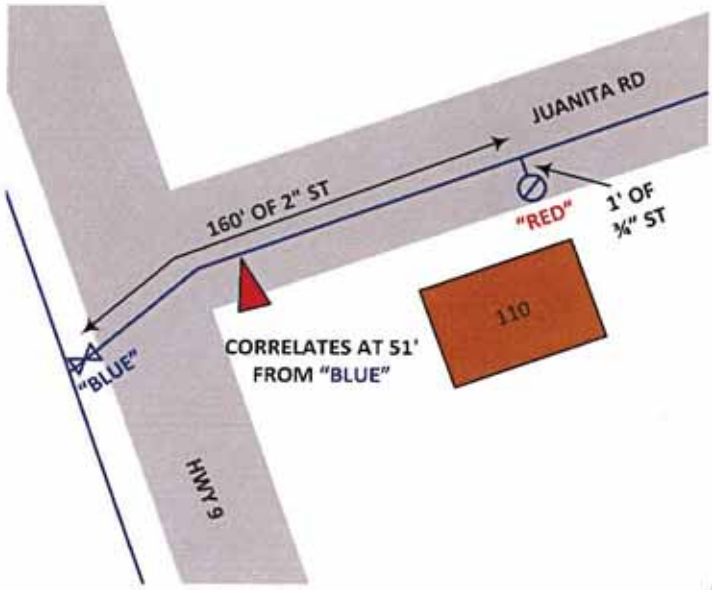
Agreement:	18259

REMARKS

ONE GOOD CORRELATION 51' FROM "BLUE" (VALVE). GROUND MICROPHONE NOISE DETECTED 48-51' FROM "BLUE". LEAK IS SMALL AND NEXT TO A PREVIOUS REPAIR PATCH.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	0.10
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	30

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	110	51

Water Loss (gallons)	
Daily:	144
Weekly:	1,008
Monthly:	4,380
Annual:	52,560

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	26
Date:	November 8, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
MAIN
Leak Address
LORENZO LN AND HWY 9

Client:	San Lorenzo Valley Water District

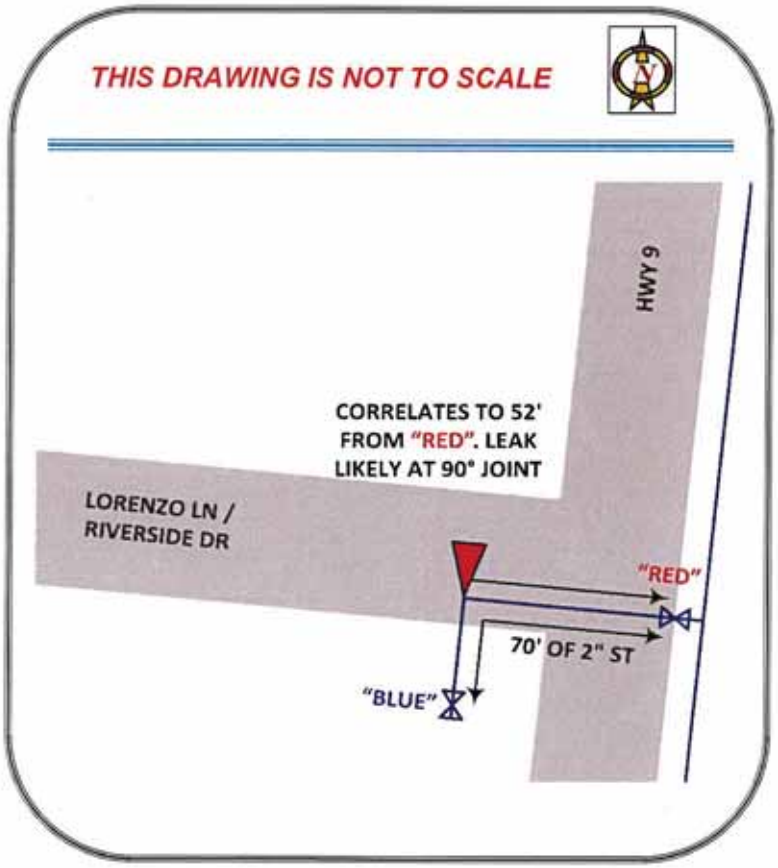
Agreement:	18259

REMARKS

ONE GOOD CORRELATION 52' FROM "RED" (VALVE). CONFIRMED WITH GROUND MICROPHONE. LEAK MOST LIKELY AT 90 DEGREE JOINT.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	0.50
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	30

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	52	18

Water Loss (gallons)	
Daily:	720
Weekly:	5,040
Monthly:	21,900
Annual:	262,800

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	27
Date:	November 8, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
MAIN
Leak Address
15610 HWY 9

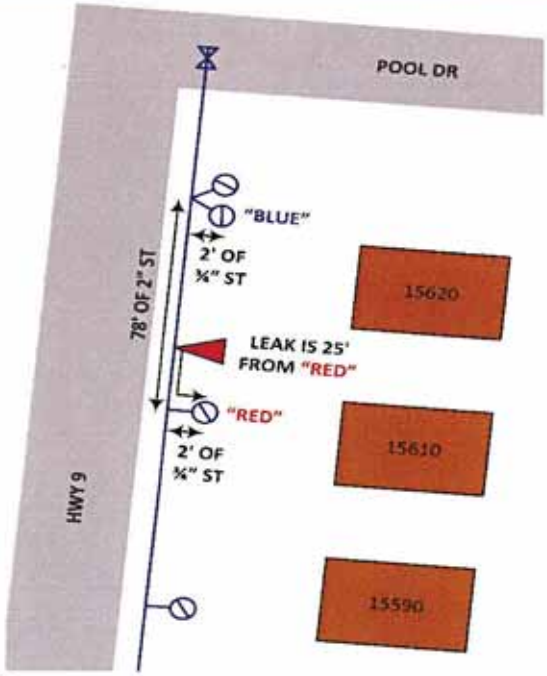
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

MULTIPLE CORRELATIONS 25' FROM "RED" (METER). CONFIRMED WITH GROUND MICROPHONE AND PROBE ROD. ALSO ONE GOOD CORRELATION 34' FROM "RED". ALL GROUND MICROPHONE NOISE IS LOCATED 25' FROM "RED".

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	2.00
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	90

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	25	57

Water Loss (gallons)	
Daily:	2,880
Weekly:	20,160
Monthly:	87,600
Annual:	1,051,200

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	28
Date:	November 8, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
OTHER
Leak Address
BEAR CREEK RD AND HARMON GULCH RD

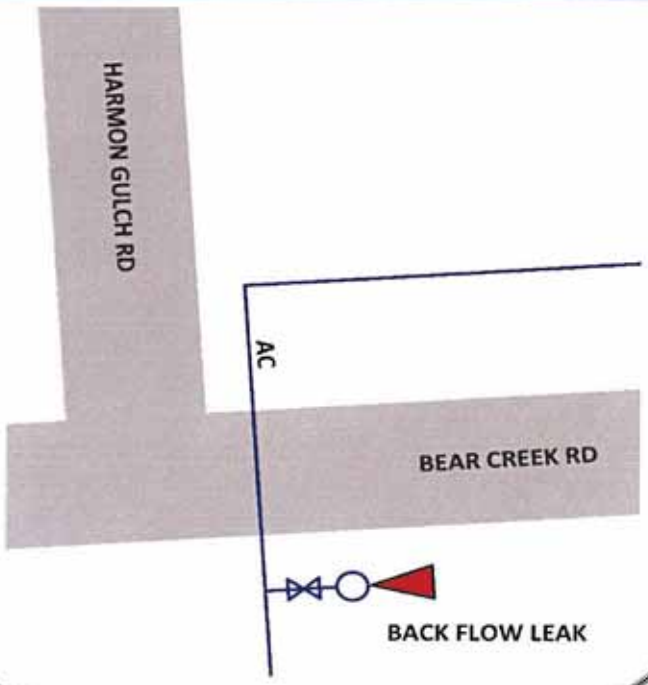
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

VISIBLE LEAK ON BACK FLOW ASSEMBLY. THIS IS A DISTRICT METER AND BACK FLOW ASSEMBLY. THE LEAK IS VERY SMALL AND NOT REGISTERING ON THE METER. THE METER SERVES THE SAN LORENZO VALLEY WASTEWATER FACILITY ON BEAR CREEK RD.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	III
Leak Rate (GPM):	0.10
Cover Type:	CONCRETE
Site Marked:	NO
Mins. Pinpointing:	20

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	144
Weekly:	1,008
Monthly:	4,380
Annual:	52,560

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	29
Date:	November 9, 2018
Map #:	
Coordinates	
37.1008004 N, 122.0351622 W	

Leak Type
MAIN
Leak Address
E ZAYANTE RD AND WANER WAY (ON BRIDGE)

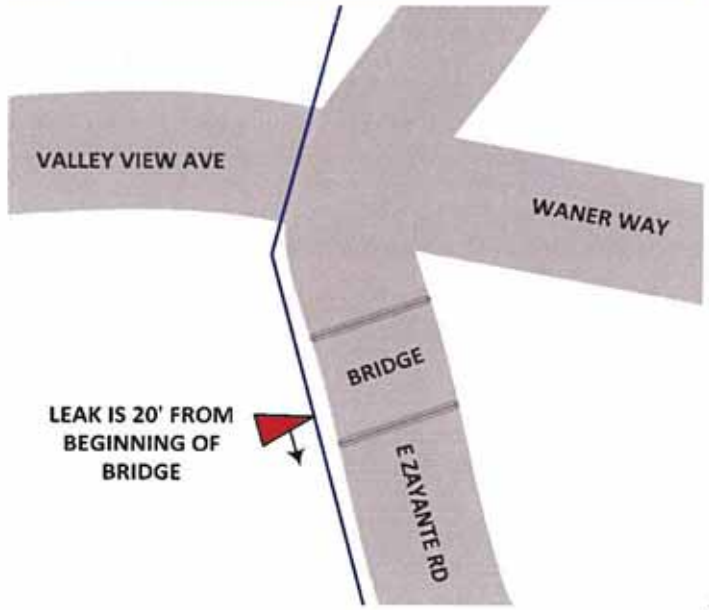
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

VISIBLE LEAK ON MAIN. LEAK IS AT PREVIOUS REPAIR BAND. MAIN HANGS OVER BRIDGE. LEAK IS APPROXIMATELY 20' FROM START OF BRIDGE.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	0.50
Cover Type:	OTHER
Site Marked:	NO
Mins. Pinpointing:	20

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	720
Weekly:	5,040
Monthly:	21,900
Annual:	262,800

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	30
Date:	November 13, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
SERVICE LINE
Leak Address
9579 MILL ST

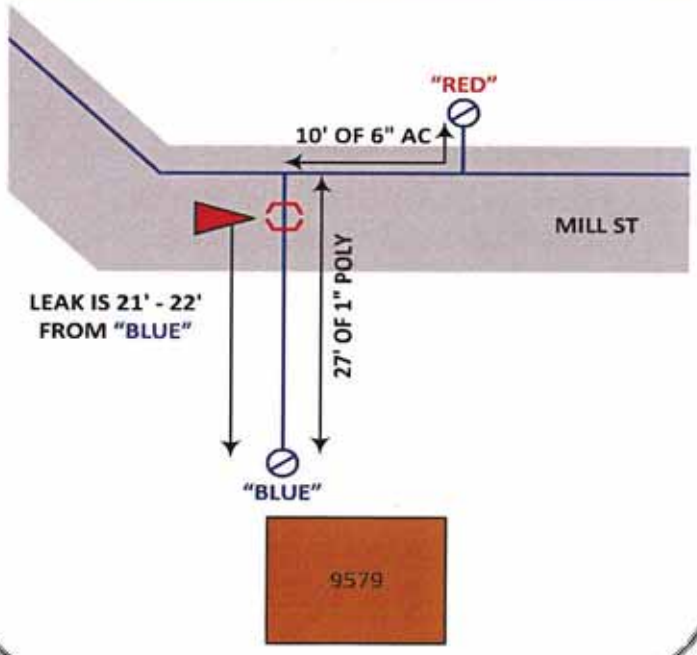
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

SPOT CHECK FOR SURFACING WATER. ONE GOOD CORRELATION 20' FROM "BLUE" (METER). CONFIRMED WITH GROUND MICROPHONE 21'-22' FROM "BLUE". NO OTHER CORRELATION OPTIONS AVAILABLE. LEAK MAY BE AT SERVICE CONNECTION AS POLY AND AC LINES ARE UNTRACEABLE.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	0.50
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	17	20

Water Loss (gallons)	
Daily:	720
Weekly:	5,040
Monthly:	21,900
Annual:	262,800

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	31
Date:	November 13, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
METER
Leak Address
10990 RIVERSIDE RD

Client:	San Lorenzo Valley Water District

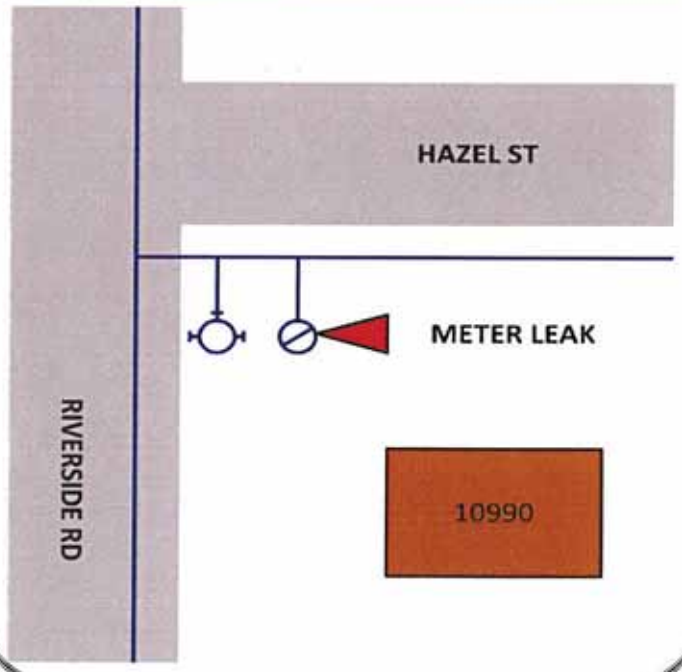
Agreement:	18259

REMARKS

VISIBLE LEAK IN METER BOX.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	III
Leak Rate (GPM):	0.10
Cover Type:	SOIL
Site Marked:	NO
Mins. Pinpointing:	15

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	144
Weekly:	1,008
Monthly:	4,380
Annual:	52,560

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	32
Date:	November 14, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
MAIN
Leak Address
1240 DUNDEE AVE

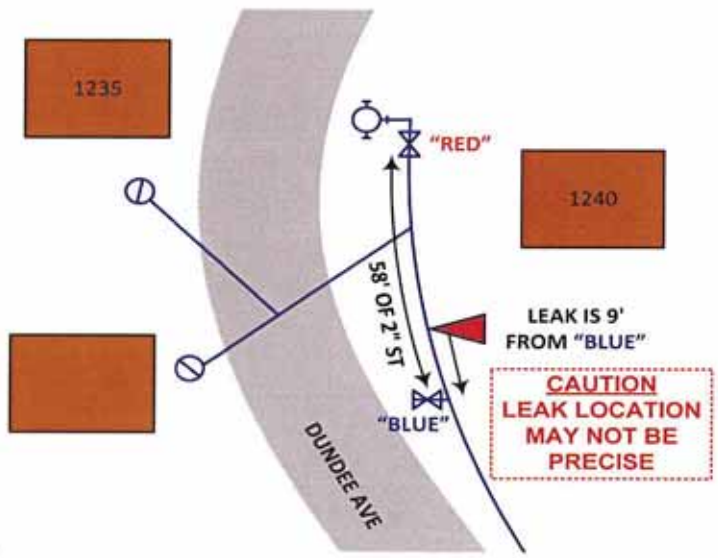
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

ONE GOOD CORRELATION 9' FROM "BLUE" (VALVE). OTHER CORRELATIONS WERE GOOD BUT INCONSISTENT. THE SERVICE LINES WERE DIFFICULT TO LOCATE AND MOST LIKELY NOT ACCURATE. THE SOIL IN THE AREA IS VERY DIFFICULT TO PROBE. EXACT LOCATION IS UNKNOWN. WE RECOMMEND MONITORING THIS AREA FOR SIGNS OF WATER. LEAK IS VERY SMALL.

Action(s) Taken: _____ _____
Recommendation(s): _____ _____

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500
PROBE ROD
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	0.25
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	90

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	47	9

Water Loss (gallons)	
Daily:	360
Weekly:	2,520
Monthly:	10,950
Annual:	131,400

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	33
Date:	November 14, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
MAIN
Leak Address
1545 JACKSON AVE

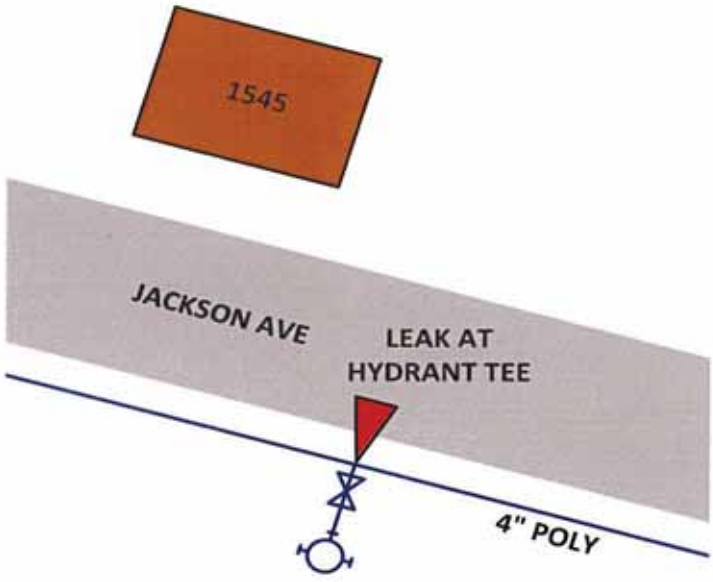
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK LOCATED WITH GROUND MICROPHONE. LEAK IS AT HYDRANT VALVE "T". VALVE WAS SHUT AND LEAK NOISE REMAINED THE SAME. NO CORRELATIONS AVAILABLE.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	1.00
Cover Type:	GRAVEL
Site Marked:	YES
Mins. Pinpointing:	20

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	1,440
Weekly:	10,080
Monthly:	43,800
Annual:	525,600

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	34
Date:	November 14, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
VALVE
Leak Address
COUNTRY CLUB DR AND JACKSON AVE

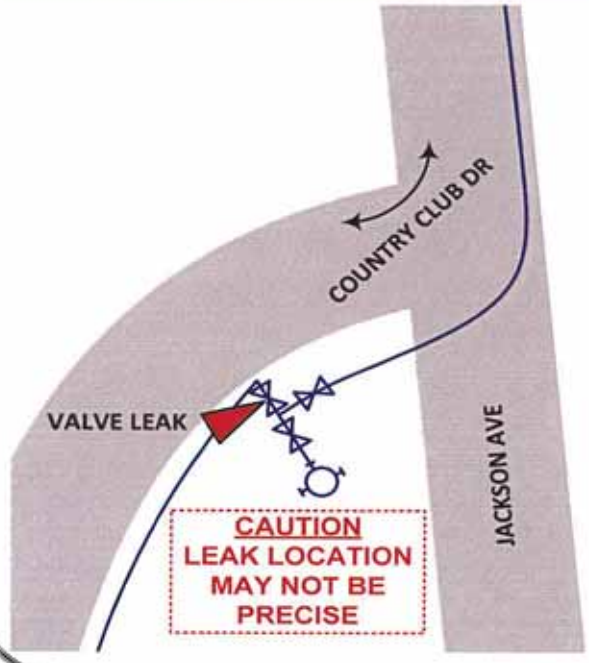
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK LOCATED WITH GROUND MICROPHONE. LEAK IS MOST LIKELY AT VALVE FLANGE. LEAK NOISE DID NOT CHANGE AFTER OPERATING VALVE. LOUDEST GROUND MICROPHONE NOISE DETECTED IS SHOWN WITH BLUE "X". NO CORRELATIONS AVAILABLE.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	1.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	20

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	1,440
Weekly:	10,080
Monthly:	43,800
Annual:	525,600

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	35
Date:	November 14, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
CURB STOP
Leak Address
11020 REDWOOD ST

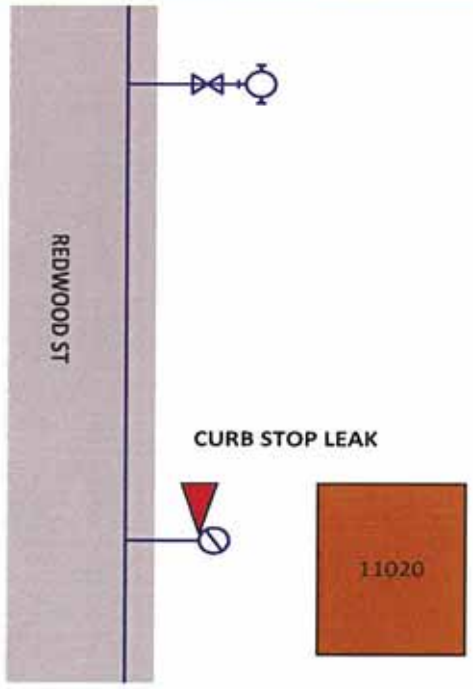
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

ONE GOOD CORRELATION TO METER. SHUT OFF METER AND CURB STOP STARTED TO LEAK. THE CURB STOP MAY HAVE BEEN LEAKING PREVIOUS TO OPERATING IT. HOWEVER, IT WILL NEED TO FIXED TO MOVE FORWARD ON THE LEAK NOISE. 11020 REDWOOD ST WAS THE LOUDEST LEAK NOISE DETECTED IN THE AREA. THE LEAK NOISE DETECTED SUGGESTS THE LEAK IS VERY SMALL.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	III
Leak Rate (GPM):	0.10
Cover Type:	METER BOX OR VAULT
Site Marked:	NO
Mins. Pinpointing:	45

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	144
Weekly:	1,008
Monthly:	4,380
Annual:	52,560

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	36
Date:	November 14, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
MAIN
Leak Address
300 OLD RIVER LN

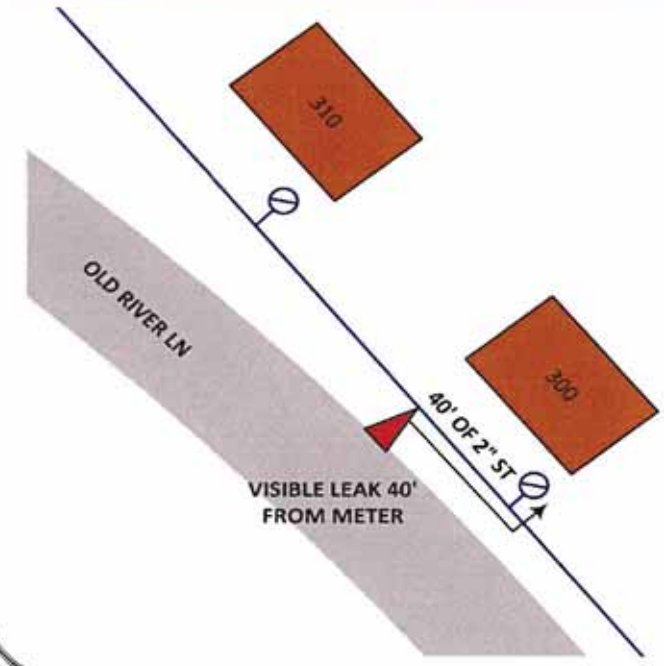
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LARGE VISIBLE SURFACING LEAK. LEAK 40' FROM METER.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
PROBE ROD

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	I
Leak Rate (GPM):	5.00
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	30

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	7,200
Weekly:	50,400
Monthly:	219,000
Annual:	2,628,000

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	37
Date:	November 15, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
MAIN
Leak Address
145 PACIFIC ST

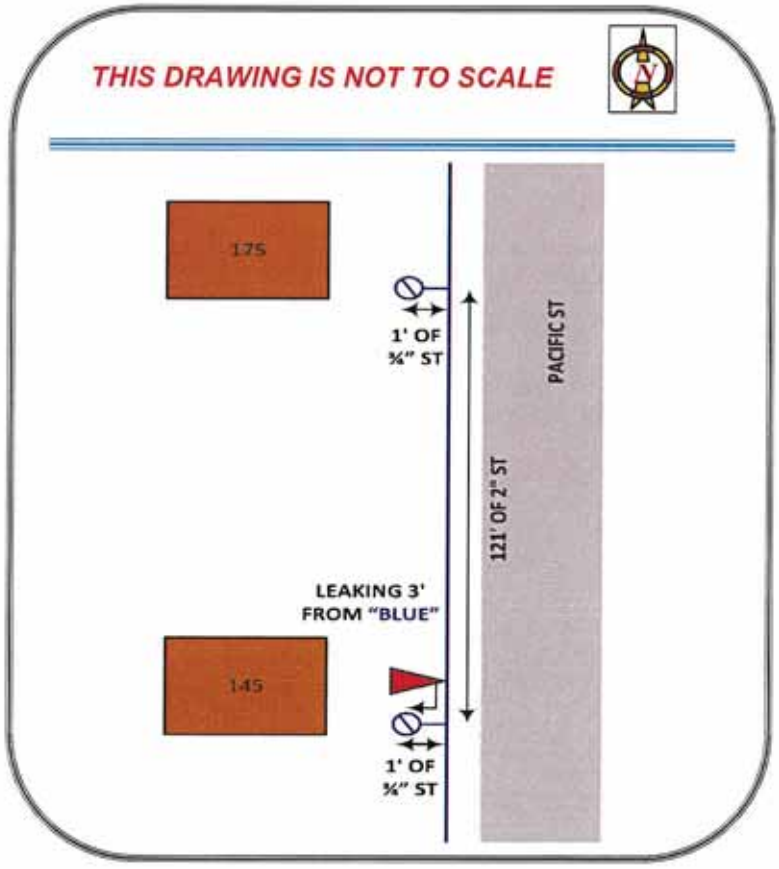
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

ONE GOOD CORRELATION 3' FROM "BLUE" (METER). CONFIRMED WITH LISTENING DEVICE AND PROBE ROD. AREA IS SATURATED.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LC-2500
PROBE ROD
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	0.50
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	30

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	720
Weekly:	5,040
Monthly:	21,900
Annual:	262,800

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	38
Date:	November 15, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
MAIN
Leak Address
13330 IRWIN WAY

Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

VISIBLE AND AUDIBLE LEAK. EXACT LEAK LOCATION IS UNKNOWN AS POLY SERVICE LINE IS UNTRACEABLE. NO CORRELATIONS AVAILABLE DUE TO UNKNOWN POLY LOCATION. SLV STAFF HAS REPAIRED THIS AREA SEVERAL TIMES IN THE PAST.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE

EQUIPMENT USED
S-30
LD-12
PROBE ROD

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	2.00
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	30

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	2,880
Weekly:	20,160
Monthly:	87,600
Annual:	1,051,200

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	39
Date:	November 16, 2018
Map #:	
Coordinates	
37.0923710 N, 122.0505430 W	

Leak Type
MAIN
Leak Address
13181 LAUREL ST

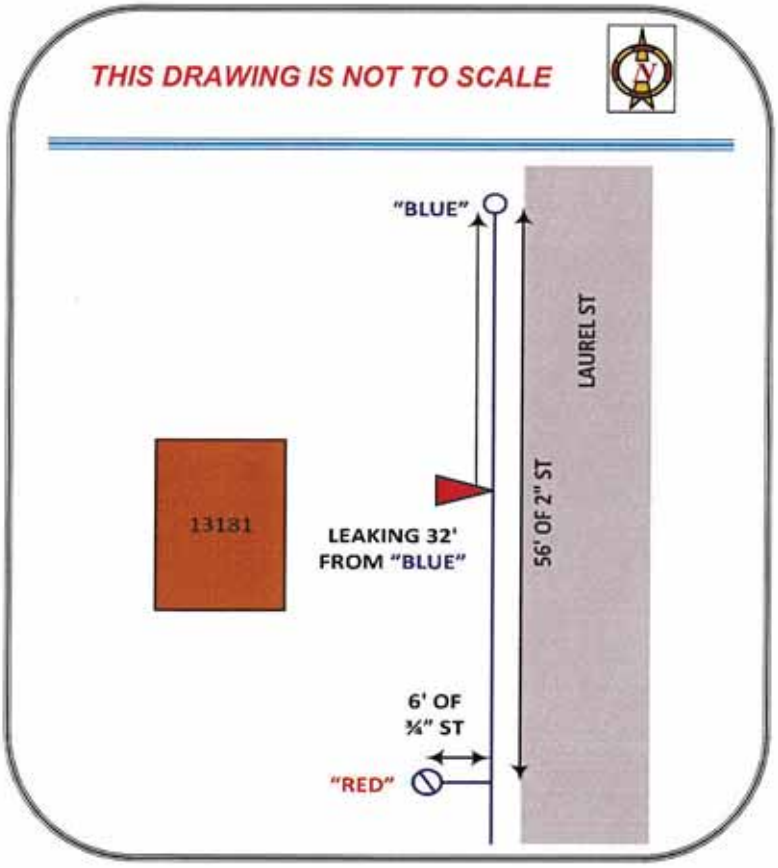
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

ONE GOOD CORRELATION 32' FROM "BLUE" (EXPOSED MAIN). CONFIRMED WITH GROUND MICROPHONE AND PROBE ROD. LEAK AREA IS COMPLETELY SATURATED ON THE SURFACE.

Action(s) Taken:
Recommendation(s): EXCAVATE & REPAIR

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
LD-12
LC-2500
PROBE ROD
LINE LOCATOR

LEAK INFORMATION	
Leak Consultant:	TO
Leak Class:	II
Leak Rate (GPM):	1.00
Cover Type:	SOIL
Site Marked:	YES
Mins. Pinpointing:	60

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
60	A	30	32

Water Loss (gallons)	
Daily:	1,440
Weekly:	10,080
Monthly:	43,800
Annual:	525,600

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	40
Date:	October 5, 2018
Map #:	
Coordinates	
37.0389575 N, 122.0869590 W	

Leak Type
CURB STOP
Leak Address
10820 WESTWOOD RD

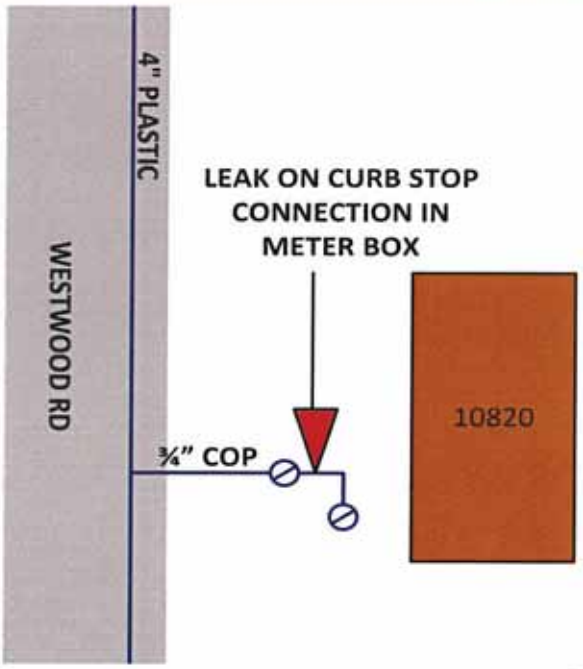
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK ON CURBSTOP CONNECTION IN METER BOX.

Action(s) Taken:
Recommendation(s): REPAIR / REPLACE

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED
S-30
VISIBLE

LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	II
Leak Rate (GPM):	1.00
Cover Type:	METER BOX OR VAULT
Site Marked:	NO
Mins. Pinpointing:	30

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	1,440
Weekly:	10,080
Monthly:	43,800
Annual:	525,600

UTILITY SERVICES ASSOCIATES
Leak Detection & Solutions

LEAK REPORT

Leak #:	U1
Date:	October 11, 2018
Map #:	
Coordinates	
37.0725142 N, 122.0859622 W	

Leak Type
UNDEFINED
Leak Address
NEAR 675 CONDOR AVE

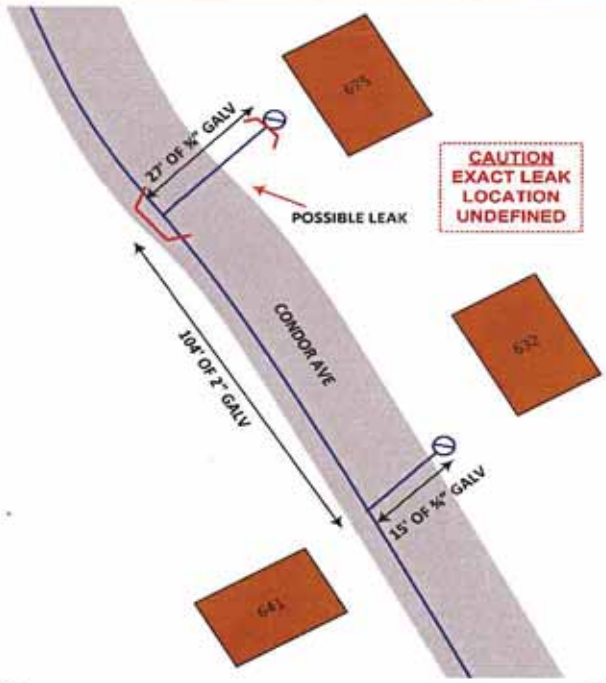
Client:	San Lorenzo Valley Water District	Agreement:	18259

REMARKS

LEAK PRESENT IN AREA. CORRELATIONS PINPOINTED TO DIFFERENT SPOTS DEPENDING ON THE FILTERS APPLIED. NO NOISE WAS DETECTED THROUGH GROUND MIC INSPECTION AND PROBE ROD SOUNDING YIELDED SLIGHT NOISE NEAR THE METER, BUT NO MOISTURE ANYWHERE. RECOMMEND PROBING THE AREA FOR MOISTURE, AND, IF NONE IS DETECTED, MONITORING THE AREA FOR ANY CHANGES. IF NOTHING CHANGES OR DEVELOPS IN THE AREA, THE LOCATION SHOULD BE RE-SURVEYED THE NEXT TIME THE SYSTEM IS SURVEYED.

Action(s) Taken: _____ _____
Recommendation(s): _____ _____

THIS DRAWING IS NOT TO SCALE



EQUIPMENT USED	
S-30	
LC-2500	
LD-12	
PROBE ROD	
LINE LOCATOR	
LEAK INFORMATION	
Leak Consultant:	RLM
Leak Class:	
Leak Rate (GPM):	
Cover Type:	
Site Marked:	NO
Mins. Pinpointing:	120

Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	
Weekly:	
Monthly:	
Annual:	

CONCLUSION

UTILITY SERVICES
ASSOCIATES
Leak Detection & Solutions

LEAK SURVEY CONCLUSION

Our thanks to James Furtado and all persons involved with this project for their assistance in gathering all the necessary paperwork and personnel to create, with USA, a mutually beneficial leak detection project.

With this survey, you have demonstrated concern for prudent water utilization and conservation.

Capitalizing on the most advanced leak detection technology available today, USA has successfully completed this Leak Detection Survey. The contents of this Final Report provide San Lorenzo Valley Water District with a permanent record of the activities performed to complete a Leak Survey along with the results achieved.

An important characteristic of this Leak Report is that the facts contained herein can be used in formulating a database for decision making regarding: the need for possible future meter programs, rehabilitation and pipe line replacement and/or the investigation of new water sources, etc. These types of decisions, regarding your utilization of water, now can be predicated more on facts rather than supposition or conjecture.

Prompt repair of any leaks reported provide an immediate benefit to San Lorenzo Valley Water District, which includes recovery of most water revenue and water conservation, etc.

Having achieved these results, we recommend that you continue to set up the infrastructure necessary to continue investigating leakage in the water distribution system. Implementation of any on-going leak survey program will ensure that leak losses are kept to a minimum, and the added enhancement of saving costs due to emergency call outs.

Utility Services Associates, LLC, is proud to have served San Lorenzo Valley Water District in this way and we wish to thank you for your substantial assistance and cooperation in this project.

If you or your staff has any questions regarding this Final Report, please feel free to call us at (877) 585-5325 or (206) 429-3751.

Best Regards,

Rob Meston
President

19655 1ST AVE SOUTH • SUITE 101 • SEATTLE, WA 98148 P 877.585.LEAK F 206.429.3441
LEAKDETECTIONSERVICE.COM

MEMO

To: Board of Directors

From: District Manager

Subject: Award of Bid – Lompico PRV Replacements

Date: February 21, 2019

Recommendation:

It is recommended that the Board of Directors review this memo and adopt the attached resolution awarding Earth Works Paving Contractors Inc., Capitola, CA bid in the amount of $468,000.00 for Lompico PRV Replacement Project

Background

On June 1, 2016 the District consolidated with Lompico County Water District. As part of the consolidation Assessment District 2016-01 was formed providing funding for water system improvements including replacing eight (8) Pressure Reducing Valve Stations (PRV) at various locations through the Lompico Water System.

In response to formal bidding the District received three bids for the replacement project as follows;

Earth Works Paving Contractors Inc	$468,000
Monterey Peninsula Engineering	$621,000
The Don Chapin Company	$780,000

Final Engineer's Report and Assessment District No. 2016-01 Merger with San Lorenzo Valley Water District Lompico County Water District estimated the 8 PRV replacement construction cost at $308,000 (see attached). After field review and distribution system changes it was determined that only 6 PRV stations needed replacement. Actual bid price of $468,000 for 6 PRV's is 52% higher than the 8 estimated.

The District has seen a steep rise in construction costs and available bidders which seems to be County wide. However the District did receive three bids for this project. Staff is concerned that the Assessment District funds will not be sufficient to cover all of the projects listed and will be referring the project list to the Engineering Committee for discussion and recommendations.

The PRV Stations are a high priority project and staff is recommending moving forward and requesting the Board of Directors adopt the attached resolution awarding Earth Works Paving Contractors Inc., Capitola, CA bid in the amount of $468,000.00 for Lompico PRV Replacement Project.

SAN LORENZO VALLEY WATER DISTRICT
RESOLUTION NO. 28 (18-19)

AWARD OF CONSTRUCTION CONTRACT FOR LOMPICO PRV REPLACEMENT PROJECT

WHEREAS, on June 1, 2016 Lompico County Water District consolidated with San Lorenzo Valley Water District; and

WHEREAS, as part of the consolidation Assessment District 2016-01 was formed to provide funding for water system improvements including 8 PRVs; and

WHEREAS, the Final Engineering Report for the project determined that only 6 PRVs needed replacement; and

WHEREAS, in response to Notice Inviting Bids the District received 3 bids for replacement with Earthworks Paving Contractors, Inc. being the lowest.

NOW, THEREFORE BE IT RESOLVED, by the Board of Directors ("Board") of the San Lorenzo Valley Water District do hereby award construction bid for replacement of Lompico PRVs to Earthworks Paving Contractors, Inc. for a total of $468,000.00.

PASSED AND ADOPTED by the Board of Directors of the San Lorenzo Valley Water District, County of Santa Cruz, State of California, on the 21st day of February, 2019 by the following vote of the members thereof:

AYES:
NOES:
ABSTAIN:
ABSENT:

_____
Holly B. Hossack
Secretary of the Board
San Lorenzo Valley Water District

Proposed Assessment District - Lompico Water District				
Number of Water Services Assessments	**507**			
Total Number of Assessments	**507**			
Projects Included	**Project Total Costs**			
	Quan.	**Unit**	**Unit Cost**	**Cost**
Install 3 New Bolted Steel Tanks				
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
Construction Sub Total				$ 487,500
Construction Contingencies @10%				$ 48,750
Surveying, Engineering and Design fees @ 15%				$ 73,125
Construction Inspection @15%				$ 73,125
Total Budget Cost Install 3 New Bolted Steel Tanks				**$ 682,500**
Refurbish Mill Creek WTP				
Refurbish Mill Creek WTP	1	ls	$ 75,000	$ 75,000
Construction Sub Total				$ 75,000
Construction Contingencies @10%				$ 7,500
Surveying, Engineering and Design fees @ 15%				$ 11,250
Construction Inspection @15%				$ 11,250
Total Budget Cost Refurbish Mill Creek WTP				**$ 105,000**
Service Line and Meter Replacements				
Replace Service Lines with New Meter	500	ea.	$ 1,500	$ 750,000
Construction Sub Total				$ 750,000
Construction Contingencies @ 5%				$ 37,500
Surveying, Engineering and Design fees @ 5%				$ 37,500
Construction Inspection @ 5%				$ 37,500
Total Budget Cost Service Line and Meter Replacements				**$ 862,500**
Distribution System Interconnection				
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
Construction Sub Total				$ 215,000
Construction Contingencies @ 10%				$ 21,500
Surveying, Engineering and Design fees @ 15%				$ 32,250
Construction Inspection @15%				$ 32,250
Total Budget Cost Distribution System Interconnection				**$ 301,000**
SCADA System				
Install RTU at Sites	6	ea.	$ 40,000	$ 240,000
Install Master Control Center	1	ea.	$ 75,000	$ 75,000
Construction Sub Total				$ 315,000
Construction Contingencies @ 10%				$ 31,500
Surveying, Engineering and Design fees @ 15%				$ 47,250
Construction Inspection @ 5%				$ 47,250
Total Budget Cost SCADA System				**$ 441,000**
Replace Existing PRV				
Remove and Replace PRV	8	ea.	$ 35,000	$ 280,000
Construction Sub Total				$ 280,000
Construction Contingencies @ 10%				$ 28,000
Surveying, Engineering and Design fees @ 15%				$ 42,000
Construction Inspection @15%				$ 8,000
Total Budget Cost Replace Existing PRV				**$ 358,000**
Total Costs All Construction Items				**$ 2,750,000**
Construction Related Costs				
San Lorenzo Valley Water District Loan Interest (10 years, $1,400,000,@ 2.5% interest)				**$ 183,734**
Total Construction Related Costs				**$ 183,734**
ENGINEER'S ESTIMATE TOTAL COSTS				**$ 2,933,734**
Number of Services				**507**
Proportionate Share (Cost/Number of Services)				**$ 5,786**
Number of Years				**10**
Cost per year (not including collection costs under Appendix G of this Report)				**$ 579**

RECEIVED
JAN 31 2019
SAN LORENZO VALLEY
WATER DISTRICT

Bid Proposal

San Lorenzo Valley Water District
13060 CA-9
Boulder Creek, CA 95006

Ladies and Gentlemen:

The undersigned hereby proposes to perform all Work for which a Contract may be awarded and to furnish any and all plant, labor, services, materials, tools, equipment, supplies, transportation, utilities, water and all other items and facilities necessary therefore as provided in the Contract Documents, and to do everything required therein for the Work as set forth in the documents entitled:

Lompico Pressure Reducing Valves Replacement

Together with appurtenances thereto, all as set forth on the Bid Package and other Contract Documents; and the Contractor further proposes and agrees that, if this Bid is accepted, he/she will contract in the form and manner stipulated to perform all the Work called for by Drawings, Specifications, and other Contract Documents, and to complete all such Work in strict conformity therewith within the time limits set forth therein, and that he/she will accept as full payment therefore the prices set forth in the Bid Sheet(s) forming a part hereof.

It is understood and agreed that:

1. The undersigned has carefully examined all the Contract Documents which will form a part of the Contract; and all additions, deletions, modifications, appendices, and all Addenda as prepared prior to the date of bid opening setting forth any modifications or interpretations of any of said documents.

2. The undersigned has by investigation of the site of the Work and otherwise satisfied himself/herself as to the nature and location of the Work and has fully informed himself/herself as to all conditions and matters which can in any way affect the Work or the cost thereof;

3. The undersigned fully understands the scope of the Work and has checked carefully all words and figures inserted in the Bid and he/she further understands that the District will in no way be responsible for any errors or omissions in the preparation of this Bid;

4. The undersigned will execute the Contract Agreement and furnish the required proof of insurance coverage within ten (10) work days (not including Sundays and holidays) after Notice of Award to him/her of acceptance of his/her Bid by the District.

5. The undersigned Bidder further agrees that if he/she shall fail to complete the Work within the Contract Time and any authorized extension thereof, he/she shall pay liquidated damages of five hundred dollars ($500) as described in the Liquidated Damages section of the General Conditions.

6. The undersigned hereby certifies that this proposal is not made in the interest of; or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

7. In conformance with current statutory requirements of Section 1860, et seq., of the Labor Code of the State of California, the undersigned confirms the following as his/her certification; I am aware of the provision of Section 3700 of the Labor Code which require every employer to be insured against liability for workmen's compensation or to undertake self insurance in accordance with the provisions before commencing the performance of the Work of this Contract.

8. The District has obtained from the Director of the Department of Industrial Relations ("DIR") the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which the Public Work is to be performed for each craft, classification or type of workman needed to execute this Contract. (Copies of the wage determination are on file and may be obtained by interested parties at the District's office). The Contractor and all Subcontractors shall comply with all requirements and provisions of Section 1775 and 1776 of the California Labor Code. The Contractor shall forfeit, as a penalty to the District, two-hundred dollars ($200.00), for each calendar day, or portion thereof, for each worker paid less than stipulated prevailing rates for Work done under the Contract Agreement by him, or any Subcontractor under him, in violation of the provisions of the California Labor Code. Copies of these wage determinations shall be posted and maintained at the job site by the successful bidding Contractor.

   a. Subject to the provisions of Section 1810 to 1815, inclusive, of the California Labor Code, the time of service of any laborer, workman, or mechanic employed on the Work shall be limited and restricted to eight (8) hours during any one (1) calendar day and forty (40) hours in any one (1) calendar week, except as otherwise provided in said sections, and the Contractor shall forfeit to the District as a penalty, twenty-five dollars ($25.00) for each laborer, worker, or mechanic employed in the execution of the Work by him or any Subcontractor under him for each calendar day during which such laborer, worker, or mechanic is required or

permitted to labor more than eight (8) hours in any one (1) calendar day and forty (40) hours in any one (1) calendar week in violation of provisions of the California Labor Code.

b. (Section Deleted)

c. The Contractor and all Subcontractors shall conform to all the requirements of Sections 1777.5 and 1777.6 of the California Labor Code concerning the employment of apprentices by the Contractor or any Subcontractor under him. The Contractor shall provide the District with a copy of the contract award information at the time that information is submitted to the applicable apprenticeship program. Within sixty (60) work days after concluding the Work pursuant to this Contract, the Contractor shall submit, and require each Subcontractor under him to submit, to the District and the apprenticeship program a verified statement of the journeyman and apprentice hours performed on the Contract.

d. Contractor and all Subcontractors shall comply with Sections 1776 and 1771.4(a)(3) of the California Labor Code, regarding payroll records, and shall be subject to penalties for violation thereof. The Contractor shall cause a clause identical to Section 00800CA, Paragraph K to be included in every subcontract for Work pursuant to this Contract.

e. Contractor shall not perform work with a Subcontractor who is ineligible to perform work on a public works project pursuant to Sections 1777.1 or 1777.7 of the California Labor Code.

9. In compliance with Section 1725.5 of the California Labor Code, Contractor must be, and must require all Subcontractors be, registered with the DIR prior to execution of the Contract Agreement. Contractor and all Subcontractors who bid or work on, and/or who are awarded the Contract Agreement, must be registered with and pay an annual fee to the DIR. Neither Contractor nor any Subcontractors may be listed on this Bid Proposal unless registered with the DIR pursuant to Section 1725.5 of the Labor Code. Neither Contractor nor any Subcontractors may be awarded the Contract Agreement unless registered with the DIR pursuant to Section 1725.5 of the Labor Code. This project is subject to compliance monitoring and enforcement by the DIR. Contractor shall submit proof of current DIR registration, and shall require all Subcontractors to submit proof of current DIR registration, to the District prior to commencing work on this project.

10. In compliance with the provisions of Section 4100-4114 of the Public Contract Code of the State of California, and any amendments thereof, the undersigned Bidder has set forth below the name and the location of the place of business of each Subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the Work to be performed under the Contract Documents in which this Bid is responsive, and where the portion of the Work which will be done by each Subcontractor for each subcontract is in excess of one-half of one percent (0.5%) of the Total Bid. The undersigned Bidder understands that if he/she fails to specify a Subcontractor for any portion of the Work or specifies more than one subcontractor for

any portion of the Work, he/she shall be deemed to have agreed to perform such portion himself/herself and that he/she shall not be permitted to sublet or subcontract that portion of the Work except in cases of public emergency or necessity, and then only after a finding is reduced to writing as a public record of the District setting forth the facts constituting the emergency or necessity.

11. Receipt is hereby acknowledged of addenda number(s) _ 1 __ through 2.

12. The undersigned is licensed in accordance with the Laws of the State of California: License Number 807689
Class A, Expiration Date 5/31/20.

13. If the Bidder is a partnership, corporation, or joint venture, the undersigned certifies that he/she is entitled to execute and submit this Bid proposal on behalf of bidder.

14. In signing below, the Bidder certifies that its Total Bid includes funds sufficient to allow the Bidder to comply with all applicable local, state, and federal laws or regulations governing the labor or services to be provided under the Contract. Furthermore, the Bidder hereby indemnifies the District for liabilities and penalties for violations of Section 2810 of the California Labor Code.

NOW: In compliance with all the provisions herein before stipulated, the undersigned, with full cognizance thereof, hereby proposes to perform the entire Work for the prices set forth in the attached Schedule(s) upon which Award of Contract is made. (A duly authorized officer of the company may sign on the president's behalf.)

Individual Contractor — Name: Ric Straus
Address: 310A Kennedy Dr, Capitola, CA 95010

~~Partnership~~ — Name: _____
Business Address: _____
Phone No.: _____
By: _____, Partner

Other Partners: _____
_____

Corporation: Name: Earthworks Paving Contractors, Inc
Business Address: 310A Kennedy Dr
Capitola, CA 95010

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San Lorenzo Valley Water District
Lompico Pressure Reducing Valves Replacement
January 2019

Business Address: _____

Phone No.: 831-475-1223

Name: Stephanie Straus, President

Title: President,

Organized under the laws of the State of CA.

Date: 1/31/19

(Place Seal Here)

By: Ric Straus
Signature

Ric Straus, VP, GM
(Print Name and Title)

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Lompico Pressure Reducing Valves Replacement

ITEM NO.	ITEM/DESCRIPTION	UNIT	TOTAL COST
1	Provide and install PRV assembly, including mobilization and traffic control, at the Coleman Ave location.	LS	78,000.00
2	Provide and install PRV assembly, including mobilization and traffic control, at the Van Allen Rd location.	LS	78,000.00
3	Provide and install PRV assembly, including mobilization and traffic control, at the Edgewood Dr location.	LS	78,000.00
4	Provide and install PRV assembly, including mobilization and traffic control, at the Lakeview Ave location.	LS	78,000.00
5	Provide and install PRV assembly, including mobilization and traffic control, at the Visitar St location.	LS	78,000.00
6	Provide and install PRV assembly, including mobilization and traffic control, at the Lake Blvd location.	LS	78,000.00
		TOTAL BID:	**$** 468,000.00

TOTAL BID (in words): four hundred sixty eight thousand dollars

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MEMO

TO: Board of Directors

FROM: District Manager

SUBJECT: Review Request for Water Service Valley Gardens Housing Project, Scotts Valley

DATE: February 21, 2019

DRAFT

Recommendation

It is recommended that the Board of Directors review this memo and the attached information regarding the "Will Serve" letter, committing to supply water to the Valley Garden housing project.

Background

The District has been working with Robson Homes, San Jose, California on converting the existing Valley Gardens Golf Course from its current use as a golf course into 207 residential dwelling units and two commercial lots. The project is located near the intersection of Lockwood Lane and Mount Herman Road in Scotts Valley. The project consists of six parcels totaling 30.74 acres. The majority of the project site is within the San Lorenzo Valley Water District boundaries and service area. The proposed commercial lots fronting Mount Herman Road are within the Scotts Valley Water District (SVWD) boundaries and service area.

On July 20, 2018 the District met with representatives of Robson Homes discussing steps for the District supplying water. The District requested that a water system analysis (modeling) of the distribution system be performed for fire flow & domestic use and provide engineering data for water demand. In August 2018 Schaaf & Wheeler Consulting Civil Engineers submitted engineering analysis with the following summary.

Based upon the system modeling, the existing SLVWD South System with the new Probation Water Tank is capable of supplying MDD (maximum daily demand) plus 1500 gpm fire flow to the Valley Gardens site without modification. This capacity is based upon the elevation difference between the Probation

Water Tank and the Valley Gardens site (approximately 320 ft.). High velocities were identified in several pipe segments during modeled fire flow events, but none exceeded 10 feet/second. Industry standards somewhat fluctuate between agencies and there is no set standard. The District's position is that velocities over 5.0 FPS will impact reliability and service life of the distribution system and improvements should be considered to maintain velocities 5.0 FPS and below.

Reliability and Service Life

Decreasing the velocity of water in a distribution system not only improves efficiency, but can also reduce the likelihood of pipe damage. Fast moving water creates a potential liability to the dependability and service life of the distribution system as follows;

- Because higher velocity can promote corrosion, piping may need to be repaired or replaced sooner than expected.
- Similarly, piping worn by abrasives and erosion may cause premature failure.
- At bends and turns, fast moving water can damage the system and lead to pitting and other problems.
- Hydraulic shock or water hammer, occurs from a sudden change in fluid velocity, and the related surge pressure is more devastating at higher speeds.
- In general, higher velocities result in worse efficiency—increasing energy expenses—and lessen system reliability—as damage to the pipe becomes more likely.

In addition to the engineering modeling report completed by Schaaf & Wheeler the District performed an additional review to look at available water supplies. Nick Johnson Senior Managing Scientist with Exponent reviewed Schaaf & Wheeler and Valley Gardens Fire Flow Analysis memorandum (attached).

His summary follows:

"Water requirements of the proposed project will exacerbate existing problems with SLVWD's Pasatiempo wells (i.e., potential for renewed water-level declines; limited pumping capacity; elevated arsenic concentrations). The South System and the Scotts Valley area in general require either additional water supplies or reduced water use in order to comply with Sustainable Groundwater Management Act (SGMA). For these reasons, supplying the proposed project

solely with water pumped from the Pasatiempo wells may be less than ideal. The South System could be in a better position to serve this project if and when its water supply is augmented by an additional source or sources (e.g., withdrawals from Loch Lomond; excess North System diversions) such that the Pasatiempo wells are not so heavily taxed".

Groundwater overdraft in the Scotts Valley area and related impacts are being addressed by SGMA member agencies.

Under the Sustainable Groundwater Management Act, over drafted groundwater basins need to be sustainably managed by a GSA through the development of a Groundwater Sustainability Plan (GSP). The GSP must be completed by 2020, and the basin must reach sustainability by 2040.

SGMA requires governments and water agencies of high and medium priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under SGMA, these basins should reach sustainability within 20 years of implementing their sustainability plans. For critically over-drafted basins, that will be 2040. For the remaining high and medium priority basins, 2042 is the deadline.

The California Department of Water Resources (DWR) announced Final Basin Prioritization for the majority of groundwater basins in the state as required under SGMA. Santa Margarita groundwater basin is officially medium priority.

Findings

The projected water demand on the site is 56.4 acre-feet/year, or about 80% of what is currently being used for golf course irrigation. If the project connects to the Scotts Valley recycled water system, their potable demand is 48.5 AFY, or 70% of the current groundwater use. The San Lorenzo Valley Water District has been serving the golf course potable water for their Club House and some makeup water for the course.

In reviewing the Schaaf & Wheeler August 1, 2018 Memorandum, page 28 shows velocities between node 2 and 34 at 6.2 FPS. Staff is recommending that this section of water main be upgraded to lower velocities below 5.0 FPS. This project would require the replacement/upgrade of approximately 2,930 lineal feet of 6" waterline to be constructed in Graham Hill Road from the Probation Center to Lockwood lane. This project can have a benefit to the District by relocating the mainline from its current location running parallel to Graham Hill Road on

property belonging to the County of Santa Cruz and City of Scotts Valley cross-country property classified as Santa Cruz Sandhills Habitat. The waterline location within the habitat means that the parcel may contain County, State or federally protected or threatened plants, animals or insects, or their habitat. Impacts to endangered species are allowed to be mitigated through the purchase of conservation credits from the Zayante Sandhills Conservation Bank. In permitting the waterline installation project one of the criteria would be that the pipeline be installed in a different location that would be out of Sandhill habitat. The short answer is yes the project would be installed parallel to the existing pipeline in Graham Hill Road out of the impacted area. Project costs are estimated at $660,000 for 6" and $820,000 for 10" difference of $160,000.

This project could be beneficial to the District by increasing the pipe diameter from 6" to 10" abandoning the existing 8" pipeline located in Sandhill Habitat. The existing pipeline has been problematic with breaks and leaks requiring tree removal and access on Sandhills property. Cost sharing between the District and developer is recommended based on water demand of the District and development needs.

All water mains and appurtenances supplying the development will be the responsibility of the project developer. Water service connection fees will be calculated in accordance with the District's current rates and charges effective per Resolution No. 7 (17-18) attached.

The "Will Serve" letter will limit the project to the project description and water demand in the attached Schaaf & Wheeler, Consulting Civil Engineers, Valley Gardens Fire Flow Analysis, August 1, 2018 Memorandum and will require water meter sizing and connection fees.

It is recommended that the Board of Directors review and comment regarding the "Will Serve" letter and attachments.

THE "WILL SERVE" LETTER WILL BE AVAILABLE AT THE BOARD OF DIRECTORS MEETING OR SOONER ON THE WEBSITE.

DRAFT

SAN LORENZO VALLEY WATER DISTRICT

MONTHLY RATES AND CHARGES

WATER BASIC RATES

	Bills after 11/1/17	Bills after 11/1/18
Meter Size	Basic Charge	Basic Charge
5/8 or 3/4	$ 28.27	$ 30.24
1	$ 42.36	$ 45.33
1.5	$ 77.61	$ 83.04
2	$ 119.91	$ 128.30
3	$ 232.70	$ 248.98
4	$ 359.58	$ 384.75
Bulk Water (1.5")	$ 77.61	$ 83.04

The above charges do not include any water usage.

WATER RATES

Per Unit of Water	Bills after 11/1/17	Bills after 11/1/18
Uniform Rate	$ 10.12	$ 10.83
Bulk Rate	$ 14.39	$ 15.40

1 unit of water = 100 Cubic Feet
100 Cubic Feet = 748 Gallons

SEWER BASIC RATES

Per Month	Bills after 11/1/17	Bills after 01/01/19
Sewer	$ 149.00	$ 178.80

METER CONNECTION FEES

Meter Size	Charge
5/8 or 3/4	$ 10,577.00
1	$ 17,629.00
1.5	$ 35,257.00
2	$ 56,412.00
3	$ 112,824.00
4	$ 176,287.00

INSTALLATION DEPOSIT

5/8 or 3/4	$ 2,500.00
1	$ 2,500.00
Meter Drop In Charges	
5/8	$ 90.00
3/4	$ 110.00
1	$ 155.00
Backflows	$ 500.00

OTHER RATES AND CHARGES

Deposit	$ 75.00
Establishment Charge	$ 20.00
Special Billing (in advance)	$ 20.00
Past Due Tag Penalty	$ 25.00
Discontinuance of Service	$ 40.00
Insufficient Fund	$ 20.00
Copies	$ 0.15
Meter Test (in advance)	$ 25.00

Rates and charges are set by the SLVWD Board of Directors.
Current rates and charges effective per Resolution No. 7 (17-18)

Exponent®

Exponent
475 14th Street, Suite 400
Oakland, CA 94612

telephone 510-268-5000
facsimile 510-268-5099
www.exponent.com

August 6, 2018

Mr. Brian Lee
General Manager
San Lorenzo Valley Water District
13060 Hwy 9
Boulder Creek, CA 95006

Subject: Review of Schaaf & Wheeler Consulting Civil Engineers, Valley Gardens Fire Flow Analysis, memorandum prepared for Robson Homes, August 1, 2018 (Exponent Project No. 1709437.000)

Dear Brian:

The subject report proposes to increase the average annual water production from SLVWD's South System by approximately 13 to 16 percent[1] (depending on whether or not the project's irrigation demand is supplied by recycled water). The proposed project will replace a golf course that is served by an on-site well nearly 1 mile away from SLVWD's Pasatiempo wells and that uses approximately 25 percent more water than the average annual use of the proposed project.[2]

The project's estimated maximum daily use is approximately 15 percent of the South System's average daily production during the historical month of maximum use.[3] The South System's maximum daily use with the subject project would equal approximately 94 percent of the South System's approximate maximum production capacity.[4]

The project's estimated maximum hourly use is approximately 31 percent of the South System's average daily production during the historical month of maximum use.[5] The South System's maximum hourly use with the subject project would equal approximately 107 percent of the South System's maximum production capacity.[3]

The project's estimated minimum required fire flow is 1,500 gallons per minute (gpm), which would presumably need to draw from tank storage.

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[1] SLVWD South System 2008-2017 average monthly production is approximately 30 acre-feet/month (AF/month); the project's proposed total and potable-only use is approximately 4 and 4.7 AF/month (48.5 and 56.4 acre-feet/year [AFY]), respectively. The estimated water requirements of the proposed project do not appear to include system losses, and thus may be roughly 10 percent too low.

[2] The subject report cites existing use by the golf course at approximately 70 AFY; the proposed project use is 56.41 AFY.

[3] Maximum monthly production from SLVWD's South System was 61.4 AF/month during July 2006, which is equivalent to 456 gallons per minute (gpm); the project's estimated maximum day use is 70 gpm.

[4] Maximum monthly production from each of SLVWD's Pasatiempo wells 5A, 6, and 7 has ranged from 270 to 290 gpm. For two operating wells the maximum monthly production capacity is estimated to be approximately 560 gpm on an average daily basis.

[5] The project's estimated maximum hourly use is 140 gpm.

The attached plot shows the water level and pumping history for SLVWD's Pasatiempo wells. Groundwater levels appear to have stabilized somewhat since about 2010, during which time South System production has averaged about 350 acre-feet/year (AFY). Water levels were falling during the previous ten years when production averaged about 17 percent higher (420 AFY). Other factors that may contribute to the apparent recent stabilization of the Pasatiempo well water levels include the near cessation of pumping by Hanson quarry in 2003 (although much of the quarry's pumping returned to the aquifer as recharge) and decreased groundwater production from Scotts Valley Water District wells 9 and 10A.

Although water levels in SLVWD's Pasatiempo wells appear to have somewhat stabilized in recent years, they remain as much as 200 feet lower than water levels were in the early 1980s. Problems associated with these lower water levels include (1) decreased production capacity due to reduced aquifer saturated thickness, (2) increased wear on the wells due to water levels below the top of the screens, and (3) increased concentrations of arsenic, at times exceeding the drinking water standard. Per the 2014 Sustainable Groundwater Management Act (SGMA), groundwater overdraft in the Scotts Valley area and related impacts must be addressed by SLVWD and others in the coming years.

In light of the information presented above, the water requirements of the proposed project will exacerbate existing problems with SLVWD's Pasatiempo wells (i.e., potential for renewed water-level declines; limited pumping capacity; elevated arsenic concentrations). The South System and the Scotts Valley area in general require either additional water supplies or reduced water use in order to comply with SGMA.

For these reasons, supplying the proposed project solely with water pumped from the Pasatiempo wells may be less than ideal. The South System could be in a better position to serve this project if and when its water supply is augmented by an additional source or sources (e.g., withdrawals from Loch Lomond; excess North System diversions) such that the Pasatiempo wells are not so heavily taxed.

Alternatively, SLVWD could consider suppling the proposed project with a well at or near the project site, essentially replacing the existing well used to irrigate the existing golf course. Although drawing from the same general aquifer as SLVWD's Pasatiempo wells, a new well at or near the proposed project would be nearly a mile away from the Pasatiempo wells and would draw from a more favorable location in terms of geologic structure and recharge. Such a well could be considered a replacement for the SLVWD's inactive Mañana Woods well.

Please let me know if you have any questions or comments, or would like to discuss this matter further.

Sincerely,

Nick Johnson
Senior Managing Scientist

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MEMORANDUM

TO:	Mr. Dominic Boitano, Robson Homes Mr. Luis Santiago-Sotelo, RJAA	DATE:	August 1, 2018
FROM:	Andrew A. Sterbenz, PE Conor Murphy, EIT	JOB#:	ROBS.01.18
SUBJECT:	Valley Gardens Fire Flow Analysis		

The purpose of this memorandum is to summarize our analysis of water supply and fire flow capacity for the Valley Gardens project in Scotts Valley, CA. The project proposes converting the existing Valley Gardens Golf Course from its current use into 207 residential dwelling units and two commercial lots (see attached Conceptual Site Plan). The site is located near the intersection of Lockewood Lane and Mount Herman Road, and consists of six parcels totaling 30.74 acres[1]. The majority of the site is within the San Lorenzo Valley Water District (SLVWD) service area. The proposed commercial lots facing Mount Herman Road are within the Scotts Valley Water District (SVWD) service area.

Water System Description

The SLVWD South System (see attached figure) consists of three pressure zones: Probation, Upper Pasatiempo and Manana Woods. The project is located within the Probation Zone. The Probation Zone is fed by three wells: Pasatiempo Well No. 5, Pasatiempo Well No. 6, and Pasatiempo Well No. 7, which draw water from the Santa Margarita Groundwater Basin[2]. Service elevations range from 524-ft to 760-ft. The Probation Zone is pressurized by the Lower Pasatiempo Reservoir and Probation Tank. The Lower Pasatiempo Reservoir is 100,000 gallons at a base elevation of 821.60 ft. The new Probation Tank is 527,000 gallons at a base elevation of 871.32 ft (currently under construction). There is a 700 gpm bi-directional pump station on Graham Hill Road connecting the SLVWD South and Felton Systems.

The Probation zone supplies the Upper Pasatiempo system, and connects to the Manana Woods zone. The system also has an emergency inter-tie to the Scotts Valley Water District Camp Evers pressure zone, which has a hydraulic grade line of 820-ft.

Estimate of Water Demand

The Valley Gardens project is a combination of Single Family Residential, Multi-Family Apartments, and Commercial land use. Table 1 shows the calculation of the Valley Gardens water demand estimate. The total average day demand for Valley Gardens is 56.41 acre-feet/year (AFY), or 50,360 gallons per day (gpd). The existing Valley Gardens Golf Course is irrigated from a private well. Existing usage is estimated to be 70 AFY[3], so the proposed project would reduce the pumping from the Santa Margarita Groundwater Basin. The City of Scotts Valley produces recycled water which is available at the project site (from a main in Mount Herman Road). Approximately 14% of the project water demand is estimated

[1] Acreage from the Santa Cruz County Assessor GIS.
[2] Basin Number 3-027 in DWR Bulletin 118.
[3] Estimate from the Scotts Valley Water District Annual Report, Water Year 2016, prepared by Hydrometrics

to be landscape irrigation which may be met using recycled water, further reducing the groundwater pumping.

Table 2 shows the estimation of average day demand (ADD), maximum day demand (MDD), and MDD plus fire flow demand. The assumed maximum day peaking factor is 2 times the average day demand. The assumed peak hour peaking factor is 4 times the average day demand.

Table 1: Valley Gardens Water Demand Estimate, based on 7/13/2018 Concept Plan

Land Use	Quantity	Unit	Demand Factor (afy/unit)	Potable (afy)	Non-Potable (afy)	Total Demand (afy)	Notes
Single Family Residential	132	DU	0.24	31.68		31.68	1
Multi-Family Apartments	75	DU	0.21	15.75		15.75	2
Commercial	2	BIZ	0.55	1.10		1.10	3
Irrigated Landscape (Non-Turf)	1.5	AC	1.59		2.44	2.44	4, 6
Irrigated Landscape (Turf)	1.5	AC	3.54		5.43	5.43	5, 6
				48.53	7.88	56.41	

Notes:

1. SFR factor from SLVVWD 2010 UWMP, equals 214 gpd/unit
2. MFR factor assumed, equals 187 gpd/unit
3. Commercial factor per connection from SLVWD 2010 UWMP, equals 491 gpd/unit
4. Assume 5% of total area is irrigated non-turf landscape. Allowable irrigation is 45% of ETo per MWELO.
5. Assume 5% of total area is irrigated turf landscape. Allowable irrigation is 100% of ETo per MWELO.
6. ETo is 42.42 inches/year at nearest CIMIS station (Delaveaga Park)

Table 2: Demand Rates

Average Day Demand (ADD)	56.41	AFY
converts to	50,357	gpd
converts to	35	gpm
Max Day Demand (MDD = ADD x 2)	70	gpm
Max Day Peak Hour (MDD x 2)	140	gpm
Minimum Fire Flow (per CA Fire Code)	1,500	gpm
MDD plus Fire	1,570	gpm

The standard fire flow rates by building size are shown in Table 3. The fire code allows the local fire authority to reduce the fire demand for buildings with fire sprinklers. A 75% reduction is allowed, with a minimum required flow rate of 1500 gpm. Fire demand was modeled at 1500 gpm, and also at 2500 gpm, assuming only a 50% reduction for fire sprinklers is allowed.

Table 3: Fire Flow Requirements for Type V-B Construction[4]

Type	Area (SF)	Flow (gpm)	Duration (hrs)
Single Family	< 3,600	1,500	2
Apartments 1 & 2	25,500	4,250	4
Apartment 3	35,700	5,000	4
Commercial	10,000	2,750	2

Estimate of Available Fire Flow

The water system was modeled using EPANet2, a computer-based pipe network model. Pipeline sizes and lengths were obtained from the SLVWD South System Map, provided by SLVWD. Elevations were obtained from LIDAR topography on the Santa Cruz County GISWeb.

The system was modeled under the following conditions:

1. Peak Hour Demand without fire flow
2. Maximum Day Demand with fire flow
3. Maximum available flow at Valley Gardens during maximum day demand

Per the SVLWD Master Plan, the average water demand for the Probation/Pasatiempo zones is 410 acre-feet/year, or 366,000 gallons per day. This equates to an average delivery rate of 254 gpm. Maximum day demand is estimated as 2 times the average daily rate, or 508 gpm. The peak hour demand is estimated as 4 times the average daily rate, or 1016 gpm. The demand at each node was based off of demand per length of pipe. For example, the average delivery rate per length of pipe is 254 gpm per 36,200 LF of pipe or 0.007 gpm/ft. The demand rates applied to the model nodes are provided in Table 4 (attached). Pipelines with street locations are listed in Table 5.

Valley Gardens was modeled with two connections to the existing system in Lockewood Lane, one at the intersection with Arrowhead Way (node 37) and the other near the existing Valley Gardens entrance (node 30)(see Figure 1). The following modeling assumptions were made:

- The booster from the Probation Zone to the Upper Pasatiempo Zone is not operating.
- The bi-directional pump connection to the Felton system is not operating.
- The two commercial sites are fed from the SLVWD system and not from SVWD
- Pasatiempo Well 5 produces 350 gpm (nominal)
- Pasatiempo Well 6 produces 120 gpm (nominal)
- Pasatiempo Well 7 is out of service
- The new Probation water tank is in service
- All tanks start at 50% full

Based on the given well production capacities, the maximum day demand may be met by well pumping but the fire demand must be met using stored water. The storage required is 180,000 gallons for residential (= 1500 gpm x 4 hours x 60 minutes) and 360,000 gallons for the largest apartment building (= 1500 gpm x 4 hrs x 60 minutes). The new Probation Tank will hold 500,000 gallons, meeting the larger storage requirement.

[4] Rates from California Fire Code, Appendix B, Table B105.1

SLVWD provided pressure monitoring data for the Probation Zone collected at the corner of Lockewood and Whispering Pines. Pressures fluctuated diurnally between 135 psi and 150 psi, operating off the wells and the current temporary water tanks at the Probation tank site. In our model, the static head matches the monitoring data, and the peak hour demand creates a 9 psi drop at that location. The remaining 6 psi difference may be accounted for by water level changes in the water tanks (the model holds the tanks at a fixed water level, but they will drain during peak hours and refill during off-peak periods) and differences between the actual and modeled well performance.

Model results were checked to identify nodes falling below 20 psi (minimum pressure required under CCR Title 22) and pipelines with velocities over 8 feet per second (ft/s). The results are summarized below.

Peak Hour Demand without Fire Flow

System is modeled with two Pasatiempo Wells operating. The demand from Valley Gardens (node 45) is 140 gpm and the demand per length of pipe is 0.028 gpm/ft. The Probation Tank is assumed to have 882 ft of head. Lower Pasatiempo was assumed to have 824.5 ft of head. No low pressure issues were identified. High velocity (above 6 ft/s) was identified in the 8" main connecting the wells and Probation Tank to the customer service area. No pipes had velocities over 7 ft/s. Results are given in Tables 6 and 7, and shown on Figure 1.

Max Day Demand with 1500 gpm Fire Flow

System is modeled with two Pasatiempo Wells operating. The demand from Valley Gardens (node 45) is 1,570 gpm and the demand per length of pipe is 0.014 gpm/ft. The Probation Tank is assumed to have 882 ft of head. Lower Pasatiempo was assumed to have 824.5 ft of head. No low pressure issues were identified. High velocity (above 8 ft/s) was identified in the 8" main connecting the wells and Probation Tank to the customer service area, and above 8 ft/s in the 6" mains around the project site. Results are given in Tables 8 and 9, and shown on Figure 2.

Max Day Demand with Fire Flow (Tanks Only)

System is modeled with both tanks but without the Pasatiempo Wells to verify the ability to meet fire flow during a power outage. The system could still deliver the target flow rate, with similar velocity issues as the previous scenario. Results are given in Tables 10 and 11, and shown on Figure 3.

Max Available Flow at Valley Gardens during MDD

System is modeled with two Pasatiempo Wells operating. The maximum allowable demand at Valley Gardens is when the pressure anywhere in the system drops below 20 psi. The bi-directional pump station demand (to Felton) is assumed to be zero (0 gpm). The demand per length of pipe is 0.014 gpm/ft. The Probation Tank is assumed to have 880 ft of head. Lower Pasatiempo was assumed to have 824.5 ft of head. The maximum available flow at Valley Gardens is 1750 gpm (determined by iterative model runs). The location reaching 20 psi was node 13 on Whispering Pines Dr, near the Lower Pasatiempo Tank. Results are given in Tables 12 and 13, and shown on Figure 4.

Max Available Flow at Valley Gardens with Planned Capital Improvements

Two planned capital improvement project are analyzed as well: Adding a 6" pipe from Arrowhead Way to Twin Pines Dr, and upsizing the 4" pipe to 8" pipe in Caseta Way. These improvements were analyzed for Max Available Flow at Valley Gardens during MDD. Adding a 6" pipe from Arrowhead Way to Twin Pines Dr in Lockewood Dr had no significant increase in the maximum available flow at Valley Gardens, because the modeled Valley Gardens pipe provided the same connectivity. Upsizing the 4" pipe in Caseta

Way to 8" pipe increased the maximum available flow at Valley Gardens from 1750 gpm to 1900 gpm. Results are given in Tables 14 and 15.

Max Day Demand with 2500 gpm Fire Flow, adding SVWD Inter-tie

System is modeled with two Pasatiempo Wells operating. The demand from Valley Gardens (node 45) is 2,570 gpm and the demand per length of pipe is 0.014 gpm/ft. The Probation Tank is assumed to have 882 ft of head. Lower Pasatiempo was assumed to have 824.5 ft of head. A 6-inch inter-tie with Scotts Valley Water District is added at the corner of Lockewood Lane and Locke Way, set to open at 100 psi. No low pressure issues were identified. High velocity (above 8 ft/s) was identified in the 8" main connecting the wells and Probation Tank to the customer service area, and above 8 ft/s in the 6" mains around the project site. SVWD contributes approximately 790 gpm of the total demand. Results are given in Tables 16 and 17.

System Concerns

High Pipe Velocity

Typical design standards require pipe velocities to be below 8 ft/s during Peak Hour, and below 10 ft/s during Max Day plus Fire Flow. Some District's establish lower velocities during maximum day demands, particularly those using booster pumps to maintain system pressure. Figure 1 shows the system network map for the Peak Hour Demand. The 8" pipe connecting the system and the Pasatiempo wells (from node 34 to node 2) has a modeled velocity of 6.01 ft/s. The 6" pipe in Bob's Lane (connecting nodes 2-3-4) also has velocity over 5 ft/s. The system is looped beyond that point, allowing multiple flow paths and lower velocities.

Pipe velocities should be kept below 10 ft/s during Max Day Demand with fire flow. Velocities higher than 10 ft/s may cause water hammer and damage to the system. None of the pipes had a modeled pipe velocity greater than 10 ft/s, but a few were above 9 ft/s. Figure 2 shows the system network map for the Max Day Demand with Fire Flow. The pipe in Lockewood Ln between Estrella Dr and Arrowhead Way (nodes 9 to 8 to 37) has a velocity over 9.7 ft/s. Consider increasing the pipe from 6" to 8' to decrease pipe velocity.

Pressure

The maximum static water pressure at the project site is estimated to be 150 psi, due to the elevation difference between the Probation Tank (872-ft) and the site (550-ft). California Plumbing Code requires pressures to be less than 80 psi at the building connection, so the developer should either (1) install a pressure-reducing vale station at the points of connection to the existing system, or (2) provide a pressure reducing valve at each individual meter. This should be determined during detailed design, since portions of the project will include multi-story apartments.

The lowest system pressure occurs in the southeast portion of the system near the Lower Pasatiempo Reservoir (nodes at elevation 760). When the system was modeled with Max Day Demand plus fire flow, the pressure dropped to 21.8 psi in this portion of the system (see Node 13 in Figure 2). This was also the limiting node when determining the maximum available flow at Valley Gardens.

Summary

Based upon the system modeling, the existing SLVWD South System with the new Probation Water Tank is capable of supplying MDD plus 1500 gpm fire flow to the Valley Gardens site without modification. This capacity is based upon the elevation difference between the Probation Water Tank and the Valley Greens Site (approximately 320-ft). Constructing the planned capital improvement replacement of the 4" main in Caseta Way with an 8" main increased the maximum available flows to 1900 gpm. Adding a 6" pressure reducing valve at the inter-tie with SVWD increased the available flows to 2500 gpm. High velocities were identified in several pipe segments during modeled fire flow events, but none exceeded 10 feet/second.

References:

1. SLVWD South System Map
2. Valley Gardens Conceptual Site Plan
3. SLVWD 2010 Urban Water Management Plan
4. SLVWD 2010 Water Supply Master Plan
5. SLVWD 2015 Urban Water Management Plan
6. California Fire Code, Appendix B, Table B105.1

Attachments:

1. Valley Gardens Conceptual Site Plan
2. SLVWD South System Map
3. Model Scenario Results Tables
4. Model Scenario Results Figures

R H A
ROBERT HIDEY ARCHITECTS

* SINGLE STORY SFD

158 OFF-STREET PARKING FOR SFD LOTS

SITE PLAN

N

0 30' 60' 120'
SCALE: 1"=60'

VALLEY GARDENS
SCOTTS VALLEY, CA

ROBERT HIDEY ARCHITECTS
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The City of Scotts Valley

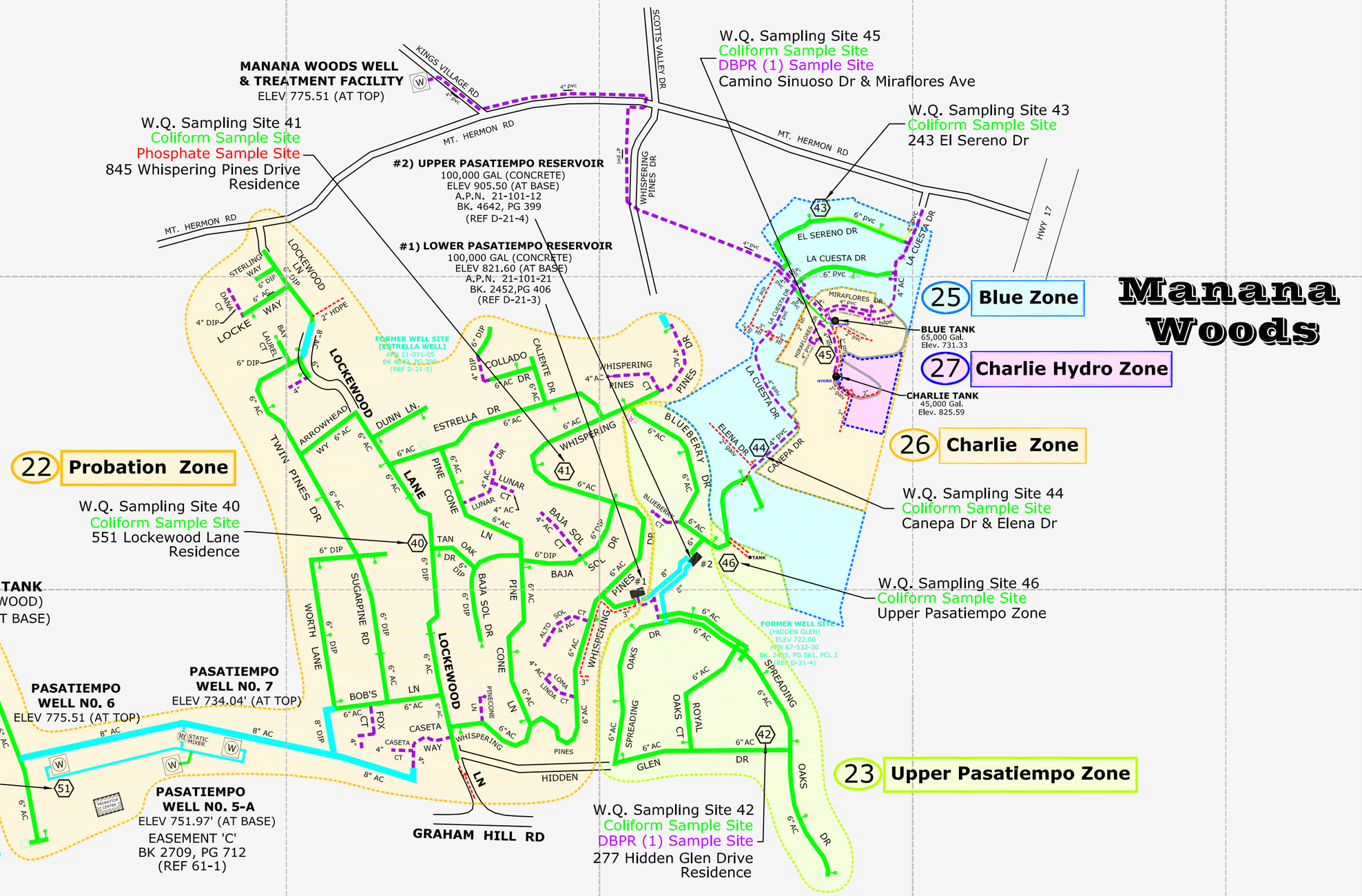


Table 4: Node Demands

	Elevation	Avg Day Demand	Max Day Demand	Peak Hour Demand	Notes
Node ID	ft	GPM	GPM	GPM	
Junc 2	665	6.9	13.8	27.6	
Junc 3	650	12.1	24.2	48.4	
Junc 4	638	2.5	5	10	
Junc 5	632	10.4	20.8	41.6	
Junc 6	620	6	12	24	
Junc 7	650	10.1	20.2	40.4	
Junc 8	572	5.2	10.4	20.8	
Junc 9	580	5.3	10.6	21.2	
Junc 10	622	2	4	8	
Junc 11	642	4.6	9.2	18.4	
Junc 12	690	9.7	19.4	38.8	
Junc 13	760	6.2	12.4	24.8	High Point
Junc 14	750	4.9	9.8	19.6	
Junc 15	738	7.2	14.4	28.8	
Junc 16	724	8.8	17.6	35.2	
Junc 17	680	6.3	12.6	25.2	
Junc 18	646	7.2	14.4	28.8	
Junc 19	614	7.5	15	30	
Junc 20	590	5.3	10.6	21.2	
Junc 21	610	12.7	25.4	50.8	
Junc 23	582	6.3	12.6	25.2	
Junc 24	592	13.3	26.6	53.2	
Junc 26	642	3.2	6.4	12.8	
Junc 27	606	5	10	20	
Junc 28	548	2.8	5.6	11.2	
Junc 29	540	3	6	12	
Junc 30	532	2.2	4.4	8.8	
Junc 31	524	9.5	19	38	Low Point
Junc 33	618	9.2	18.4	36.8	
Junc 34	765	0	0	0	
Junc 36	640	3.5	7	14	
Junc 37	562	1.6	3.2	6.4	
Junc 39	780	16	32	64	
Junc 25	765	0	0	0	
Junc 40	770	0	0	0	
Junc 41	734	0	0	0	
Junc 42	775	0	0	0	
Junc 45	550	35	70	140	Valley Gardens

Table 5: Pipe Locations (Links)

Start Node	End Node		
		Link ID	
2	3	Pipe 1	From 8" AC to Bob's Ln
3	4	Pipe 2	Bob's Ln
3	6	Pipe 3	Worth Ln
5	4	Pipe 4	Bob's Ln
5	33	Pipe 5	Bob's Ln
33	20	Pipe 6	Lockewood Ln
20	19	Pipe 7	Tan Oak Dr
5	6	Pipe 8	Sugarpine Rd
6	7	Pipe 9	Twin Pines Dr
28	29	Pipe 11	Lockewood Ln
29	30	Pipe 12	Lockewood Ln
8	9	Pipe 16	Lockewood Ln
9	20	Pipe 17	Lockewood Ln
9	23	Pipe 18	Estrella Dr
23	24	Pipe 19	Estrella Dr
24	26	Pipe 21	Estrella Dr
26	27	Pipe 22	Whispering Pines Dr
16	17	Pipe 24	Baja Sol Dr
17	18	Pipe 25	Baja Sol Dr
18	19	Pipe 26	Baja Sol Dr
23	21	Pipe 27	Pine Cone Ln
21	18	Pipe 29	Pine Cone Ln
15	14	Pipe 31	Whispering Pines Dr
14	13	Pipe 32	Whispering Pines Dr
12	11	Pipe 35	Whispering Pines Dr
11	10	Pipe 36	Whispering Pines Dr
33	10	Pipe 37	Lockewood Ln
2	34	Pipe 40	Wells to South System
36	2	Pipe 42	From Caseta Wy to 8" AC
7	37	Pipe 43	Arrowhead Wy
37	8	Pipe 44	Lockewood Ln
26	16	Pipe 45	Whispering Pines Dr
16	15	Pipe 30	Whispering Pines Dr
15	38	Pipe 46	Whispering Pines Dr to Lower Pasatiempo Res
13	12	Pipe 47	Whispering Pines Dr
12	18	Pipe 48	Pine Cone Ln
28	7	Pipe 49	Twin Pines Dr
30	31	Pipe 50	Lockewood Ln
25	35	Pipe 14	From Probation Tank
34	25	Pipe 15	Near Probation Tank Tee

Start Node	End Node		
25	39	Pipe 20	To Probation Center
42	40	Pipe 33	Pasatiempo Well 6
42	40	Pipe 39	Pasatiempo Well 7
40	34	Pipe 51	To Pasatiempo Wells
37	45	Pipe 54	From Arrowhead Wy to Valley Gardens
45	30	Pipe 55	From driveway to Valley Gardens
36	10	Pipe 13	Caseta Wy

Table 6: Peak Hour Demand without Fire Flow, Nodes

	Elevation	Base Demand	Demand	Head	Pressure
Node ID	ft	GPM	GPM	ft	psi
Junc 2	665	27.6	27.6	857.05	83.22
Junc 3	650	48.4	48.4	854.4	88.57
Junc 4	638	10	10	850.69	92.16
Junc 5	632	41.6	41.6	849.08	94.06
Junc 6	620	24	24	848.41	98.97
Junc 7	650	40.4	40.4	842.93	83.6
Junc 8	572	20.8	20.8	841.96	116.98
Junc 9	580	21.2	21.2	841.96	113.51
Junc 10	622	8	8	846.17	97.13
Junc 11	642	18.4	18.4	844.98	87.95
Junc 12	690	38.8	38.8	842.92	66.26
Junc 13	760	24.8	24.8	842.19	35.61
Junc 14	750	19.6	19.6	841.86	39.8
Junc 15	738	28.8	28.8	841.79	44.97
Junc 16	724	35.2	35.2	841.71	51
Junc 17	680	25.2	25.2	841.81	70.11
Junc 18	646	28.8	28.8	842	84.93
Junc 19	614	30	30	842.14	98.85
Junc 20	590	21.2	21.2	842.45	109.39
Junc 21	610	50.8	50.8	841.77	100.43
Junc 23	582	25.2	25.2	841.77	112.56
Junc 24	592	53.2	53.2	841.54	108.13
Junc 26	642	12.8	12.8	841.54	86.46
Junc 27	606	20	20	841.52	102.05
Junc 28	548	11.2	11.2	842.07	127.42
Junc 29	540	12	12	841.96	130.84
Junc 30	532	8.8	8.8	841.92	134.29
Junc 31	524	38	38	841.87	137.73
Junc 33	618	36.8	36.8	846.27	98.91
Junc 34	765	0	0	881.14	50.33
Junc 36	640	14	14	856.49	93.8
Junc 37	562	6.4	6.4	841.99	121.32
Junc 39	780	64	64	881.24	43.87
Junc 25	765	0	0	881.3	50.39
Junc 40	770	0	0	881.34	48.24
Junc 41	734	0	0	882.89	64.51
Junc 42	775	0	0	881.55	46.17
Junc 45	550	140	140	841.91	126.48
Resvr 43	278	#N/A	-347.47	278	0
Resvr 44	331	#N/A	-119.82	331	0

	Elevation	Base Demand	Demand	Head	Pressure
Tank 35	872	#N/A	-538.71	882	4.33
Tank 38	821	#N/A	0	828	3.03

Table 7: Peak Hour Demand without Fire Flow, Links

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
		Link ID	ft	in		GPM	fps	ft/Kft	
2	3	Pipe 1	330	8.55	120	706.09	3.95	8.04	0.024
3	4	Pipe 2	275	6	140	428.64	4.86	13.47	0.018
3	6	Pipe 3	1460	6.4	120	229.05	2.28	4.1	0.027
5	4	Pipe 4	125	6	140	-418.64	4.75	12.89	0.018
5	33	Pipe 5	420	6	140	293.99	3.34	6.7	0.019
33	20	Pipe 6	1075	6	130	193.83	2.2	3.55	0.024
20	19	Pipe 7	410	6.4	120	91.89	0.92	0.76	0.031
5	6	Pipe 8	1070	6.4	120	83.05	0.83	0.63	0.031
6	7	Pipe 9	850	6	140	288.1	3.27	6.45	0.019
28	29	Pipe 11	125	6	130	89.92	1.02	0.86	0.027
29	30	Pipe 12	260	8	130	77.92	0.5	0.16	0.028
8	9	Pipe 16	260	6	140	10.5	0.12	0.01	0.031
9	20	Pipe 17	700	6	130	-80.74	0.92	0.7	0.027
9	23	Pipe 18	400	6	140	70.04	0.79	0.47	0.024
23	24	Pipe 19	900	6	140	50.63	0.57	0.26	0.025
24	26	Pipe 21	530	6	140	-2.57	0.03	0	0.039
26	27	Pipe 22	460	6	140	20	0.23	0.05	0.029
16	17	Pipe 24	520	6.4	120	-43.52	0.43	0.19	0.035
17	18	Pipe 25	440	6.4	120	-68.72	0.69	0.44	0.032
18	19	Pipe 26	390	6.4	120	-61.89	0.62	0.36	0.033
23	21	Pipe 27	460	6	140	-5.79	0.07	0	0.035
21	18	Pipe 29	713	6	140	-56.59	0.64	0.32	0.025
15	14	Pipe 31	235	6	140	-55.85	0.63	0.31	0.025
14	13	Pipe 32	610	6	140	-75.45	0.86	0.54	0.024
12	11	Pipe 35	480	6	140	-231.27	2.62	4.29	0.02
11	10	Pipe 36	240	6	140	-249.67	2.83	4.95	0.02
33	10	Pipe 37	250	6	140	63.36	0.72	0.39	0.024
2	34	Pipe 40	1690	8	140	-942	6.01	14.26	0.017
36	2	Pipe 42	650	8	140	-208.31	1.33	0.87	0.021
7	37	Pipe 43	510	6	140	146.58	1.66	1.85	0.021
37	8	Pipe 44	230	6	140	31.3	0.36	0.11	0.027
26	16	Pipe 45	1260	6	140	-35.37	0.4	0.13	0.027
16	15	Pipe 30	1030	6	140	-27.05	0.31	0.08	0.028
15	38	Pipe 46	400	6	130	0	0	0	0
13	12	Pipe 47	800	6	140	-100.25	1.14	0.91	0.023

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
12	18	Pipe 48	1180	6	140	92.22	1.05	0.78	0.023
28	7	Pipe 49	930	6	140	-101.12	1.15	0.93	0.023
30	31	Pipe 50	320	6.4	120	38	0.38	0.15	0.035
25	35	Pipe 14	990	12	140	-538.71	1.53	0.7	0.019
34	25	Pipe 15	40	8	140	-474.71	3.03	4.01	0.019
25	39	Pipe 20	690	8	140	64	0.41	0.1	0.025
42	40	Pipe 33	600	8	130	119.82	0.76	0.36	0.026
42	40	Pipe 39	600	8	130	347.47	2.22	2.58	0.023
40	34	Pipe 51	50	8	140	467.29	2.98	3.89	0.019
37	45	Pipe 54	760	10	130	108.88	0.44	0.1	0.027
45	30	Pipe 55	610	10	130	-31.12	0.13	0.01	0.033
36	10	Pipe 13	460	4	140	194.31	4.96	22.42	0.02
43	41	Pump 52	#N/A	#N/A	#N/A	347.47	0	-604.89	0
44	42	Pump 53	#N/A	#N/A	#N/A	119.82	0	-550.55	0

Table 8: Maximum Day Demand with Fire Flow, Nodes

	Elevation	Base Demand	Demand	Head	Pressure
Node ID	ft	GPM	GPM	ft	psi
Junc 2	665	13.8	13.8	831.51	72.15
Junc 3	650	24.2	24.2	825.61	76.09
Junc 4	638	5	5	818.2	78.08
Junc 5	632	20.8	20.8	814.88	79.24
Junc 6	620	12	12	805.6	80.42
Junc 7	650	20.2	20.2	771.67	52.72
Junc 8	572	10.4	10.4	777.43	89.01
Junc 9	580	10.6	10.6	790.36	91.15
Junc 10	622	4	4	812.96	82.74
Junc 11	642	9.2	9.2	812.47	73.87
Junc 12	690	19.4	19.4	811.6	52.69
Junc 13	760	12.4	12.4	813.74	23.29
Junc 14	750	9.8	9.8	815.59	28.42
Junc 15	738	14.4	14.4	816.37	33.96
Junc 16	724	17.6	17.6	804.85	35.03
Junc 17	680	12.6	12.6	803.87	53.67
Junc 18	646	14.4	14.4	803.16	68.1
Junc 19	614	15	15	802.56	81.7
Junc 20	590	10.6	10.6	802.05	91.88
Junc 21	610	25.4	25.4	798.41	81.64
Junc 23	582	12.6	12.6	795.82	92.65
Junc 24	592	26.6	26.6	798.16	89.33
Junc 26	642	6.4	6.4	799.94	68.44
Junc 27	606	10	10	799.94	84.03
Junc 28	548	5.6	5.6	762.01	92.73
Junc 29	540	6	6	760.56	95.57
Junc 30	532	4.4	4.4	759.84	98.72
Junc 31	524	19	19	759.83	102.19
Junc 33	618	18.4	18.4	812.73	84.37
Junc 34	765	0	0	879.58	49.65
Junc 36	640	7	7	830.62	82.59
Junc 37	562	3.2	3.2	766.24	88.5
Junc 39	780	32	32	880.08	43.36
Junc 25	765	0	0	880.1	49.87
Junc 40	770	0	0	879.78	47.57
Junc 41	734	0	0	881.34	63.84
Junc 42	775	0	0	880	45.5
Junc 45	550	1570	1570	759.34	90.71
Resvr 43	278	#N/A	-348.83	278	0
Resvr 44	331	#N/A	-123.48	331	0

	Elevation	Base Demand	Demand	Head	Pressure
Tank 35	872	#N/A	-927.45	882	4.33
Tank 38	821	#N/A	-603.23	828	3.03

Table 9: Maximum Day Demand with Fire Flow, Links

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
		Link ID	ft	in		GPM	fps	ft/Kft	
2	3	Pipe 1	330	8.55	120	1087.19	6.08	17.89	0.022
3	4	Pipe 2	275	6	140	623.48	7.07	26.95	0.017
3	6	Pipe 3	1460	6.4	120	439.5	4.38	13.7	0.024
5	4	Pipe 4	125	6	140	-618.48	7.02	26.56	0.017
5	33	Pipe 5	420	6	140	254.46	2.89	5.13	0.02
33	20	Pipe 6	1075	6	130	337.61	3.83	9.93	0.022
20	19	Pipe 7	410	6.4	120	-120.09	1.2	1.24	0.03
5	6	Pipe 8	1070	6.4	120	343.22	3.42	8.67	0.025
6	7	Pipe 9	850	6	140	770.72	8.75	39.92	0.017
28	29	Pipe 11	125	6	130	367.01	4.16	11.59	0.022
29	30	Pipe 12	260	8	130	361.01	2.3	2.77	0.022
8	9	Pipe 16	260	6	140	-868.08	9.85	49.75	0.017
9	20	Pipe 17	700	6	130	-447.1	5.07	16.7	0.021
9	23	Pipe 18	400	6	140	-431.58	4.9	13.64	0.018
23	24	Pipe 19	900	6	140	-176.36	2	2.6	0.021
24	26	Pipe 21	530	6	140	-202.96	2.3	3.37	0.02
26	27	Pipe 22	460	6	140	10	0.11	0.01	0.032
16	17	Pipe 24	520	6.4	120	150.7	1.5	1.89	0.029
17	18	Pipe 25	440	6.4	120	138.1	1.38	1.61	0.029
18	19	Pipe 26	390	6.4	120	135.09	1.35	1.54	0.029
23	21	Pipe 27	460	6	140	-267.82	3.04	5.64	0.02
21	18	Pipe 29	713	6	140	-293.22	3.33	6.67	0.019
15	14	Pipe 31	235	6	140	201.18	2.28	3.32	0.021
14	13	Pipe 32	610	6	140	191.38	2.17	3.02	0.021
12	11	Pipe 35	480	6	140	-145.04	1.65	1.81	0.022
11	10	Pipe 36	240	6	140	-154.24	1.75	2.03	0.021
33	10	Pipe 37	250	6	140	-101.55	1.15	0.94	0.023
2	34	Pipe 40	1690	8	140	-1367.77	8.73	28.44	0.016
36	2	Pipe 42	650	8	140	-266.78	1.7	1.38	0.02
7	37	Pipe 43	510	6	140	377.91	4.29	10.66	0.019
37	8	Pipe 44	230	6	140	-857.68	9.73	48.66	0.017
26	16	Pipe 45	1260	6	140	-219.36	2.49	3.89	0.02
16	15	Pipe 30	1030	6	140	-387.66	4.4	11.18	0.019
15	38	Pipe 46	400	6	130	-603.23	6.84	29.09	0.02
13	12	Pipe 47	800	6	140	178.98	2.03	2.67	0.021

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
12	18	Pipe 48	1180	6	140	304.61	3.46	7.15	0.019
28	7	Pipe 49	930	6	140	-372.61	4.23	10.39	0.019
30	31	Pipe 50	320	6.4	120	19	0.19	0.04	0.039
25	35	Pipe 14	990	12	140	-927.45	2.63	1.92	0.018
34	25	Pipe 15	40	8	140	-895.45	5.72	12.98	0.017
25	39	Pipe 20	690	8	140	32	0.2	0.03	0.028
42	40	Pipe 33	600	8	130	123.48	0.79	0.38	0.026
42	40	Pipe 39	600	8	130	348.83	2.23	2.6	0.022
40	34	Pipe 51	50	8	140	472.32	3.01	3.97	0.019
37	45	Pipe 54	760	10	130	1232.39	5.03	9.07	0.019
45	30	Pipe 55	610	10	130	-337.61	1.38	0.82	0.023
36	10	Pipe 13	460	4	140	259.78	6.63	38.39	0.019
43	41	Pump 52	#N/A	#N/A	#N/A	348.83	0	-603.34	0
44	42	Pump 53	#N/A	#N/A	#N/A	123.48	0	-549	0

Table 10: Maximum Day Demand with Fire Flow (Tanks Only), Nodes

	Elevation	Base Demand	Demand	Head	Pressure
Node ID	ft	GPM	GPM	ft	psi
Junc 2	665	13.8	13.8	829.81	71.41
Junc 3	650	24.2	24.2	824.02	75.4
Junc 4	638	5	5	816.79	77.47
Junc 5	632	20.8	20.8	813.55	78.67
Junc 6	620	12	12	804.24	79.83
Junc 7	650	20.2	20.2	770.49	52.21
Junc 8	572	10.4	10.4	776.33	88.54
Junc 9	580	10.6	10.6	789.33	90.7
Junc 10	622	4	4	811.79	82.24
Junc 11	642	9.2	9.2	811.36	73.39
Junc 12	690	19.4	19.4	810.6	52.26
Junc 13	760	12.4	12.4	812.95	22.94
Junc 14	750	9.8	9.8	814.97	28.15
Junc 15	738	14.4	14.4	815.82	33.72
Junc 16	724	17.6	17.6	803.98	34.66
Junc 17	680	12.6	12.6	802.95	53.27
Junc 18	646	14.4	14.4	802.2	67.68
Junc 19	614	15	15	801.57	81.27
Junc 20	590	10.6	10.6	801.03	91.44
Junc 21	610	25.4	25.4	797.43	81.21
Junc 23	582	12.6	12.6	794.83	92.22
Junc 24	592	26.6	26.6	797.2	88.92
Junc 26	642	6.4	6.4	799.02	68.03
Junc 27	606	10	10	799.01	83.63
Junc 28	548	5.6	5.6	760.85	92.23
Junc 29	540	6	6	759.41	95.07
Junc 30	532	4.4	4.4	758.69	98.23
Junc 31	524	19	19	758.68	101.69
Junc 33	618	18.4	18.4	811.53	83.86
Junc 34	765	0	0	876.89	48.48
Junc 36	640	7	7	828.94	81.87
Junc 37	562	3.2	3.2	765.09	88
Junc 39	780	32	32	877.98	42.46
Junc 25	765	0	0	878	48.96
Junc 40	770	0	0	495.38	-118.99
Junc 41	734	0	0	495.38	-103.4
Junc 42	775	0	0	495.38	-121.16
Junc 45	550	1570	1570	758.19	90.21
Resvr 43	278	#N/A	0	278	0
Resvr 44	331	#N/A	0	331	0

	Elevation	Base Demand	Demand	Head	Pressure
Tank 35	872	#N/A	-1384.58	882	4.33
Tank 38	821	#N/A	-618.42	828	3.03

Table 11: Maximum Day Demand with Fire Flow (Tanks Only), Links

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
		Link ID	ft	in		GPM	fps	ft/Kft	
2	3	Pipe 1	330	8.55	120	1076.1	6.01	17.55	0.022
3	4	Pipe 2	275	6	140	615.17	6.98	26.29	0.017
3	6	Pipe 3	1460	6.4	120	436.73	4.36	13.54	0.025
5	4	Pipe 4	125	6	140	-610.17	6.92	25.9	0.017
5	33	Pipe 5	420	6	140	245.53	2.79	4.8	0.02
33	20	Pipe 6	1075	6	130	334.63	3.8	9.77	0.022
20	19	Pipe 7	410	6.4	120	-123.34	1.23	1.3	0.03
5	6	Pipe 8	1070	6.4	120	343.84	3.43	8.7	0.025
6	7	Pipe 9	850	6	140	768.57	8.72	39.71	0.017
28	29	Pipe 11	125	6	130	366.43	4.16	11.55	0.022
29	30	Pipe 12	260	8	130	360.43	2.3	2.76	0.022
8	9	Pipe 16	260	6	140	-870.23	9.87	49.98	0.017
9	20	Pipe 17	700	6	130	-447.37	5.08	16.72	0.021
9	23	Pipe 18	400	6	140	-433.46	4.92	13.75	0.018
23	24	Pipe 19	900	6	140	-177.78	2.02	2.64	0.021
24	26	Pipe 21	530	6	140	-204.38	2.32	3.42	0.02
26	27	Pipe 22	460	6	140	10	0.11	0.01	0.032
16	17	Pipe 24	520	6.4	120	155.08	1.55	1.99	0.029
17	18	Pipe 25	440	6.4	120	142.48	1.42	1.7	0.029
18	19	Pipe 26	390	6.4	120	138.34	1.38	1.61	0.029
23	21	Pipe 27	460	6	140	-268.28	3.04	5.65	0.02
21	18	Pipe 29	713	6	140	-293.68	3.33	6.69	0.019
15	14	Pipe 31	235	6	140	210.56	2.39	3.61	0.02
14	13	Pipe 32	610	6	140	200.76	2.28	3.31	0.021
12	11	Pipe 35	480	6	140	-134.97	1.53	1.58	0.022
11	10	Pipe 36	240	6	140	-144.17	1.64	1.79	0.022
33	10	Pipe 37	250	6	140	-107.5	1.22	1.04	0.022
2	34	Pipe 40	1690	8	140	-1352.58	8.63	27.86	0.016
36	2	Pipe 42	650	8	140	-262.67	1.68	1.34	0.02
7	37	Pipe 43	510	6	140	376.34	4.27	10.58	0.019
37	8	Pipe 44	230	6	140	-859.83	9.76	48.88	0.017
26	16	Pipe 45	1260	6	140	-220.78	2.51	3.94	0.02
16	15	Pipe 30	1030	6	140	-393.46	4.46	11.49	0.019
15	38	Pipe 46	400	6	130	-618.42	7.02	30.46	0.02
13	12	Pipe 47	800	6	140	188.36	2.14	2.94	0.021

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
12	18	Pipe 48	1180	6	140	303.93	3.45	7.12	0.019
28	7	Pipe 49	930	6	140	-372.03	4.22	10.36	0.019
30	31	Pipe 50	320	6.4	120	19	0.19	0.04	0.039
25	35	Pipe 14	990	12	140	-1384.58	3.93	4.04	0.017
34	25	Pipe 15	40	8	140	-1352.58	8.63	27.86	0.016
25	39	Pipe 20	690	8	140	32	0.2	0.03	0.028
42	40	Pipe 33	600	8	130	0	0	0	0
42	40	Pipe 39	600	8	130	0	0	0	0
40	34	Pipe 51	50	8	140	0	0	0	0
37	45	Pipe 54	760	10	130	1232.97	5.04	9.08	0.019
45	30	Pipe 55	610	10	130	-337.03	1.38	0.82	0.023
36	10	Pipe 13	460	4	140	255.67	6.53	37.27	0.019
43	41	Pump 52	#N/A	#N/A	#N/A	0	0	0	0
44	42	Pump 53	#N/A	#N/A	#N/A	0	0	0	0

Table 12: Maximum Day with Maximum Flow to Valley Gardens, Nodes

	Elevation	Base Demand	Demand	Head	Pressure
Node ID	ft	GPM	GPM	ft	psi
Junc 2	665	13.8	13.8	822.97	68.45
Junc 3	650	24.2	24.2	816.58	72.18
Junc 4	638	5	5	808.79	74
Junc 5	632	20.8	20.8	805.3	75.09
Junc 6	620	12	12	793.89	75.35
Junc 7	650	20.2	20.2	753.9	45.02
Junc 8	572	10.4	10.4	761.49	82.1
Junc 9	580	10.6	10.6	777.57	85.61
Junc 10	622	4	4	803.95	78.84
Junc 11	642	9.2	9.2	803.67	70.05
Junc 12	690	19.4	19.4	803.18	49.04
Junc 13	760	12.4	12.4	806.92	20.33
Junc 14	750	9.8	9.8	810.06	26.02
Junc 15	738	14.4	14.4	811.35	31.78
Junc 16	724	17.6	17.6	795.99	31.19
Junc 17	680	12.6	12.6	794.51	49.62
Junc 18	646	14.4	14.4	793.41	63.87
Junc 19	614	15	15	792.53	77.36
Junc 20	590	10.6	10.6	791.75	87.42
Junc 21	610	25.4	25.4	787.68	76.99
Junc 23	582	12.6	12.6	784.5	87.74
Junc 24	592	26.6	26.6	787.58	84.74
Junc 26	642	6.4	6.4	789.85	64.06
Junc 27	606	10	10	789.84	79.66
Junc 28	548	5.6	5.6	742.32	84.2
Junc 29	540	6	6	740.58	86.91
Junc 30	532	4.4	4.4	739.71	90
Junc 31	524	19	19	739.7	93.46
Junc 33	618	18.4	18.4	803.51	80.38
Junc 34	765	0	0	874.42	47.41
Junc 36	640	7	7	822.05	78.88
Junc 37	562	3.2	3.2	747.53	80.39
Junc 39	780	32	32	875.62	41.43
Junc 25	765	0	0	875.64	47.94
Junc 40	770	0	0	494.49	-119.38
Junc 41	734	0	0	494.49	-103.78
Junc 42	775	0	0	494.49	-121.54
Junc 45	550	1750	1750	739.1	81.94
Resvr 43	278	#N/A	0	278	0
Resvr 44	331	#N/A	0	331	0

	Elevation	Base Demand	Demand	Head	Pressure
Tank 35	872	#N/A	-1451	880	3.47
Tank 38	821	#N/A	-732	828	3.03

Table 13: Maximum Day with Maximum Flow to Valley Gardens, Links

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
		Link ID	ft	in		GPM	fps	ft/Kft	
2	3	Pipe 1	330	8.55	120	1134.92	6.34	19.37	0.022
3	4	Pipe 2	275	6	140	640.32	7.27	28.32	0.017
3	6	Pipe 3	1460	6.4	120	470.4	4.69	15.54	0.024
5	4	Pipe 4	125	6	140	-635.32	7.21	27.91	0.017
5	33	Pipe 5	420	6	140	230.63	2.62	4.27	0.02
33	20	Pipe 6	1075	6	130	355.73	4.04	10.94	0.022
20	19	Pipe 7	410	6.4	120	-151.04	1.51	1.9	0.029
5	6	Pipe 8	1070	6.4	120	383.89	3.83	10.67	0.025
6	7	Pipe 9	850	6	140	842.29	9.56	47.05	0.017
28	29	Pipe 11	125	6	130	405.21	4.6	13.92	0.021
29	30	Pipe 12	260	8	130	399.21	2.55	3.33	0.022
8	9	Pipe 16	260	6	140	-976.51	11.08	61.87	0.016
9	20	Pipe 17	700	6	130	-496.18	5.63	20.26	0.021
9	23	Pipe 18	400	6	140	-490.93	5.57	17.31	0.018
23	24	Pipe 19	900	6	140	-204.51	2.32	3.42	0.02
24	26	Pipe 21	530	6	140	-231.11	2.62	4.29	0.02
26	27	Pipe 22	460	6	140	10	0.11	0.01	0.032
16	17	Pipe 24	520	6.4	120	187.91	1.87	2.84	0.028
17	18	Pipe 25	440	6.4	120	175.31	1.75	2.5	0.028
18	19	Pipe 26	390	6.4	120	166.04	1.66	2.26	0.028
23	21	Pipe 27	460	6	140	-299.03	3.39	6.91	0.019
21	18	Pipe 29	713	6	140	-324.43	3.68	8.04	0.019
15	14	Pipe 31	235	6	140	264.58	3	5.51	0.02
14	13	Pipe 32	610	6	140	254.78	2.89	5.14	0.02
12	11	Pipe 35	480	6	140	-106.58	1.21	1.02	0.023
11	10	Pipe 36	240	6	140	-115.78	1.31	1.19	0.022
33	10	Pipe 37	250	6	140	-143.5	1.63	1.77	0.022
2	34	Pipe 40	1690	8	140	-1419	9.06	30.44	0.016
36	2	Pipe 42	650	8	140	-270.28	1.73	1.41	0.02
7	37	Pipe 43	510	6	140	411.28	4.67	12.47	0.018
37	8	Pipe 44	230	6	140	-966.11	10.96	60.66	0.016
26	16	Pipe 45	1260	6	140	-247.51	2.81	4.87	0.02
16	15	Pipe 30	1030	6	140	-453.02	5.14	14.92	0.018
15	38	Pipe 46	400	6	130	-732	8.31	41.62	0.019
13	12	Pipe 47	800	6	140	242.38	2.75	4.68	0.02

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
12	18	Pipe 48	1180	6	140	329.56	3.74	8.28	0.019
28	7	Pipe 49	930	6	140	-410.81	4.66	12.45	0.018
30	31	Pipe 50	320	6.4	120	19	0.19	0.04	0.039
25	35	Pipe 14	990	12	140	-1451	4.12	4.4	0.017
34	25	Pipe 15	40	8	140	-1419	9.06	30.44	0.016
25	39	Pipe 20	690	8	140	32	0.2	0.03	0.028
42	40	Pipe 33	600	8	130	0	0	0	0
42	40	Pipe 39	600	8	130	0	0	0	0
40	34	Pipe 51	50	8	140	0	0	0	0
37	45	Pipe 54	760	10	130	1374.19	5.61	11.1	0.019
45	30	Pipe 55	610	10	130	-375.81	1.54	1.01	0.023
36	10	Pipe 13	460	4	140	263.28	6.72	39.35	0.019
43	41	Pump 52	#N/A	#N/A	#N/A	0	0	0	0
44	42	Pump 53	#N/A	#N/A	#N/A	0	0	0	0

Table 14: MDD with Fire Flow and Planned Capital Improvements, Nodes

	Elevation	Base Demand	Demand	Head	Pressure
Node ID	ft	GPM	GPM	ft	psi
Junc 2	665	13.8	13.8	812.38	63.86
Junc 3	650	24.2	24.2	807.96	68.44
Junc 4	638	5	5	803.86	71.87
Junc 5	632	20.8	20.8	802.04	73.68
Junc 6	620	12	12	786.8	72.27
Junc 7	650	20.2	20.2	742.53	40.1
Junc 8	572	10.4	10.4	752.44	78.18
Junc 9	580	10.6	10.6	771.8	83.11
Junc 10	622	4	4	805.32	79.43
Junc 11	642	9.2	9.2	804.67	70.49
Junc 12	690	19.4	19.4	803.5	49.18
Junc 13	760	12.4	12.4	806.83	20.29
Junc 14	750	9.8	9.8	809.63	25.84
Junc 15	738	14.4	14.4	810.8	31.54
Junc 16	724	17.6	17.6	793.63	30.17
Junc 17	680	12.6	12.6	792.04	48.55
Junc 18	646	14.4	14.4	790.86	62.77
Junc 19	614	15	15	789.73	76.14
Junc 20	590	10.6	10.6	788.7	86.1
Junc 21	610	25.4	25.4	784.02	75.4
Junc 23	582	12.6	12.6	780.17	85.87
Junc 24	592	26.6	26.6	783.85	83.13
Junc 26	642	6.4	6.4	786.51	62.62
Junc 27	606	10	10	786.51	78.21
Junc 28	548	5.6	5.6	729.42	78.61
Junc 29	540	6	6	727.45	81.22
Junc 30	532	4.4	4.4	726.46	84.26
Junc 31	524	19	19	726.45	87.72
Junc 33	618	18.4	18.4	802.06	79.75
Junc 34	765	0	0	873.4	46.97
Junc 36	640	7	7	808.21	72.89
Junc 37	562	3.2	3.2	735.62	75.23
Junc 39	780	32	32	874.83	41.09
Junc 25	765	0	0	874.85	47.6
Junc 40	770	0	0	494.1	-119.55
Junc 41	734	0	0	494.1	-103.95
Junc 42	775	0	0	494.1	-121.72
Junc 45	550	1900	1900	725.76	76.16
Resvr 43	278	#N/A	0	278	0
Resvr 44	331	#N/A	0	331	0

	Elevation	Base Demand	Demand	Head	Pressure
Tank 35	872	#N/A	-1587.94	880	3.47
Tank 38	821	#N/A	-745.06	828	3.03

Table 15: MDD with Fire Flow and Planned Capital Improvement, Links

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
		Link ID	ft	in		GPM	fps	ft/Kft	
2	3	Pipe 1	330	8.55	120	929.96	5.2	13.4	0.023
3	4	Pipe 2	275	6	140	452.75	5.14	14.9	0.018
3	6	Pipe 3	1460	6.4	120	453.01	4.52	14.49	0.024
5	4	Pipe 4	125	6	140	-447.75	5.08	14.6	0.018
5	33	Pipe 5	420	6	140	-21.78	0.25	0.05	0.028
33	20	Pipe 6	1075	6	130	381.09	4.32	12.42	0.021
20	19	Pipe 7	410	6.4	120	-175.16	1.75	2.49	0.028
5	6	Pipe 8	1070	6.4	120	448.72	4.48	14.24	0.024
6	7	Pipe 9	850	6	140	889.73	10.1	52.08	0.016
28	29	Pipe 11	125	6	130	433.84	4.92	15.8	0.021
29	30	Pipe 12	260	8	130	427.84	2.73	3.79	0.022
8	9	Pipe 16	260	6	140	-1079.07	12.24	74.44	0.016
9	20	Pipe 17	700	6	130	-545.65	6.19	24.15	0.02
9	23	Pipe 18	400	6	140	-544.02	6.17	20.94	0.018
23	24	Pipe 19	900	6	140	-225.13	2.55	4.09	0.02
24	26	Pipe 21	530	6	140	-251.73	2.86	5.03	0.02
26	27	Pipe 22	460	6	140	10	0.11	0.01	0.032
16	17	Pipe 24	520	6.4	120	195.23	1.95	3.05	0.028
17	18	Pipe 25	440	6.4	120	182.63	1.82	2.69	0.028
18	19	Pipe 26	390	6.4	120	190.16	1.9	2.9	0.028
23	21	Pipe 27	460	6	140	-331.48	3.76	8.37	0.019
21	18	Pipe 29	713	6	140	-356.88	4.05	9.59	0.019
15	14	Pipe 31	235	6	140	249.7	2.83	4.95	0.02
14	13	Pipe 32	610	6	140	239.9	2.72	4.6	0.02
12	11	Pipe 35	480	6	140	-170.71	1.94	2.45	0.021
11	10	Pipe 36	240	6	140	-179.91	2.04	2.7	0.021
33	10	Pipe 37	250	6	140	-421.27	4.78	13.04	0.018
2	34	Pipe 40	1690	8	140	-1555.94	9.93	36.11	0.016
36	2	Pipe 42	650	8	140	-612.18	3.91	6.42	0.018
7	37	Pipe 43	510	6	140	430.1	4.88	13.55	0.018
37	8	Pipe 44	230	6	140	-1068.67	12.13	73.12	0.016
26	16	Pipe 45	1260	6	140	-268.13	3.04	5.65	0.02
16	15	Pipe 30	1030	6	140	-480.96	5.46	16.67	0.018
15	38	Pipe 46	400	6	130	-745.06	8.45	43.01	0.019
13	12	Pipe 47	800	6	140	227.5	2.58	4.17	0.02

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
12	18	Pipe 48	1180	6	140	378.81	4.3	10.71	0.019
28	7	Pipe 49	930	6	140	-439.44	4.99	14.1	0.018
30	31	Pipe 50	320	6.4	120	19	0.19	0.04	0.039
25	35	Pipe 14	990	12	140	-1587.94	4.5	5.2	0.017
34	25	Pipe 15	40	8	140	-1555.94	9.93	36.11	0.016
25	39	Pipe 20	690	8	140	32	0.2	0.03	0.028
42	40	Pipe 33	600	8	130	0	0	0	0
42	40	Pipe 39	600	8	130	0	0	0	0
40	34	Pipe 51	50	8	140	0	0	0	0
37	45	Pipe 54	760	10	130	1495.56	6.11	12.98	0.019
45	30	Pipe 55	610	10	130	-404.44	1.65	1.15	0.023
36	10	Pipe 13	460	8	140	605.18	3.86	6.28	0.018
43	41	Pump 52	#N/A	#N/A	#N/A	0	0	0	0
44	42	Pump 53	#N/A	#N/A	#N/A	0	0	0	0

Table 16, MDD with Fire Flow and SVWD Inter-tie, Nodes

	Elevation	Base Demand	Demand	Head	Pressure
Node ID	ft	GPM	GPM	ft	psi
Junc 2	665	13.8	13.8	825.28	69.45
Junc 3	650	24.2	24.2	818.6	73.06
Junc 4	638	5	5	810.39	74.7
Junc 5	632	20.8	20.8	806.71	75.7
Junc 6	620	12	12	795.19	75.91
Junc 7	650	20.2	20.2	754.32	45.2
Junc 8	572	10.4	10.4	761.03	81.91
Junc 9	580	10.6	10.6	777.62	85.63
Junc 10	622	4	4	805.07	79.32
Junc 11	642	9.2	9.2	804.71	70.5
Junc 12	690	19.4	19.4	804.07	49.43
Junc 13	760	12.4	12.4	807.58	20.62
Junc 14	750	9.8	9.8	810.52	26.22
Junc 15	738	14.4	14.4	811.74	31.95
Junc 16	724	17.6	17.6	796.42	31.38
Junc 17	680	12.6	12.6	794.99	49.82
Junc 18	646	14.4	14.4	793.92	64.09
Junc 19	614	15	15	793.05	77.58
Junc 20	590	10.6	10.6	792.28	87.65
Junc 21	610	25.4	25.4	788.02	77.14
Junc 23	582	12.6	12.6	784.74	87.85
Junc 24	592	26.6	26.6	787.87	84.87
Junc 26	642	6.4	6.4	790.19	64.21
Junc 27	606	10	10	790.18	79.81
Junc 28	548	5.6	5.6	744.47	85.13
Junc 29	540	6	6	742.99	87.96
Junc 30	532	4.4	4.4	742.26	91.1
Junc 31	524	19	19	754.79	100
Junc 33	618	18.4	18.4	804.66	80.88
Junc 34	765	0	0	879.14	49.46
Junc 36	640	7	7	824.3	79.86
Junc 37	562	3.2	3.2	746.64	80
Junc 39	780	32	32	879.74	43.22
Junc 25	765	0	0	879.76	49.72
Junc 40	770	0	0	879.34	47.38
Junc 41	734	0	0	880.9	63.65
Junc 42	775	0	0	879.57	45.31
Junc 45	550	2570	2570	737.5	81.25
Junc 22	530	0	0	818.76	125.12
Junc 32	530	0	0	818.76	125.12

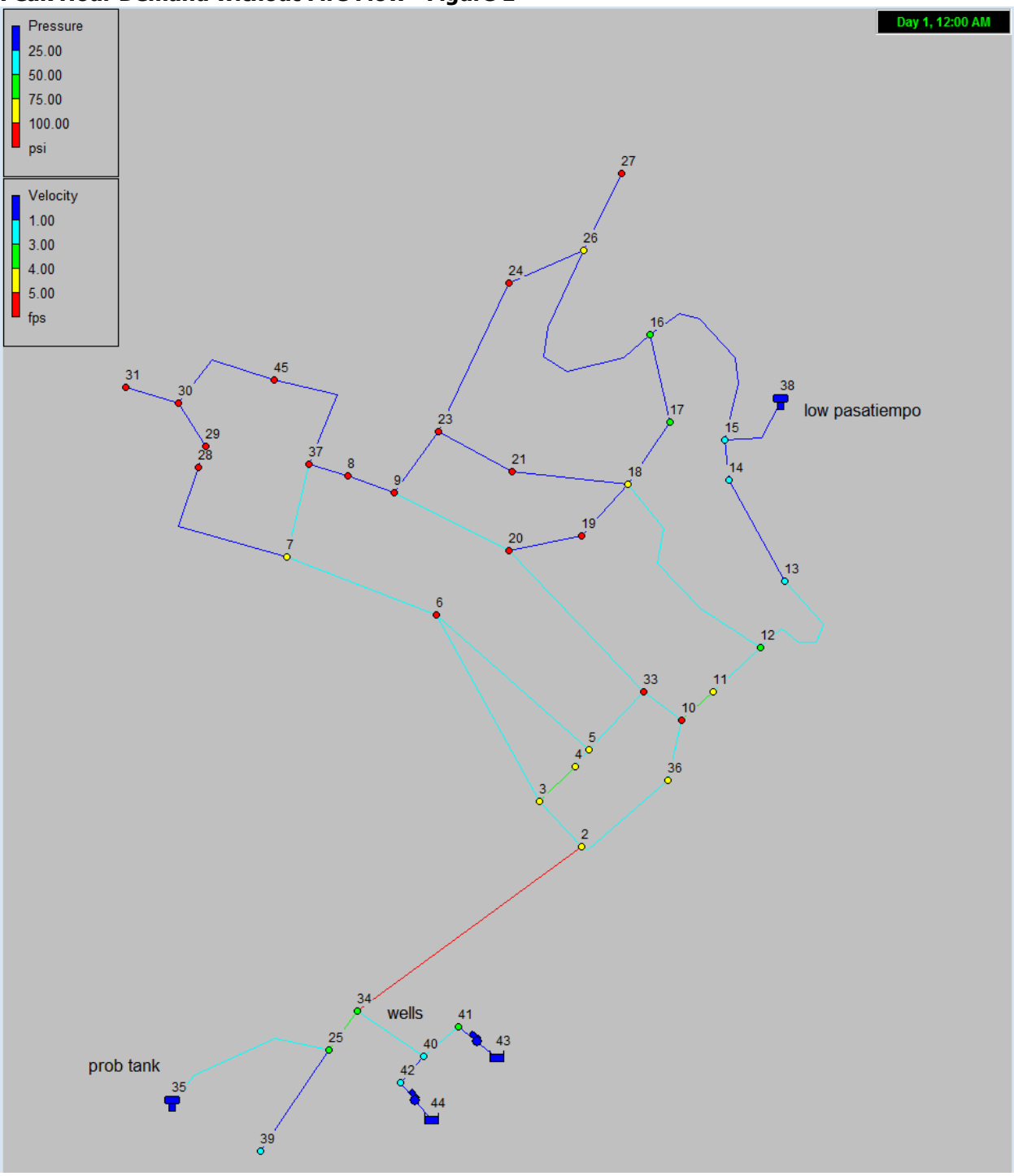
	Elevation	Base Demand	Demand	Head	Pressure
Junc 46	530	0	0	812.53	122.42
Resvr 43	278	#N/A	-349.21	278	0
Resvr 44	331	#N/A	-123.62	331	0
Resvr 1	820	#N/A	-793.75	820	0
Tank 35	872	#N/A	-1013.71	882	4.33
Tank 38	821	#N/A	-722.71	828	3.03

Table 17, MDD with Fire Flow and SVWD Inter-tie, Links

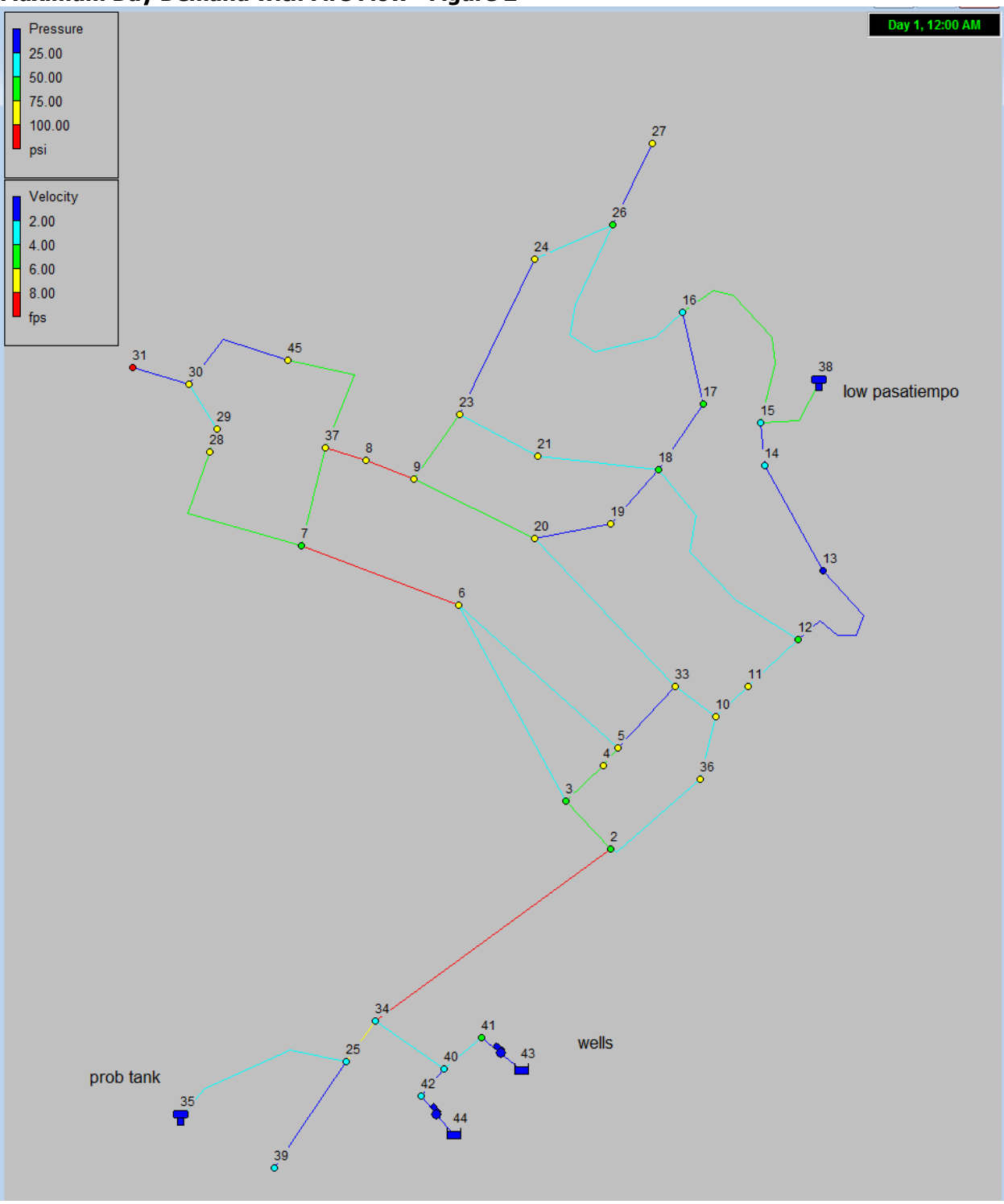
Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
		Link ID	ft	in		GPM	fps	ft/Kft	
2	3	Pipe 1	330	8.55	120	1161.68	6.49	20.23	0.022
3	4	Pipe 2	275	6	140	659.05	7.48	29.87	0.017
3	6	Pipe 3	1460	6.4	120	478.43	4.77	16.04	0.024
5	4	Pipe 4	125	6	140	-654.05	7.42	29.45	0.017
5	33	Pipe 5	420	6	140	247.48	2.81	4.87	0.02
33	20	Pipe 6	1075	6	130	365.8	4.15	11.52	0.022
20	19	Pipe 7	410	6.4	120	-150.03	1.5	1.87	0.029
5	6	Pipe 8	1070	6.4	120	385.76	3.85	10.76	0.025
6	7	Pipe 9	850	6	140	852.19	9.67	48.08	0.017
28	29	Pipe 11	125	6	130	370.97	4.21	11.82	0.021
29	30	Pipe 12	260	8	130	364.97	2.33	2.82	0.022
8	9	Pipe 16	260	6	140	-992.85	11.27	63.8	0.016
9	20	Pipe 17	700	6	130	-505.23	5.73	20.95	0.021
9	23	Pipe 18	400	6	140	-498.22	5.65	17.79	0.018
23	24	Pipe 19	900	6	140	-206.64	2.34	3.49	0.02
24	26	Pipe 21	530	6	140	-233.24	2.65	4.36	0.02
26	27	Pipe 22	460	6	140	10	0.11	0.01	0.032
16	17	Pipe 24	520	6.4	120	185.04	1.85	2.76	0.028
17	18	Pipe 25	440	6.4	120	172.44	1.72	2.42	0.028
18	19	Pipe 26	390	6.4	120	165.03	1.65	2.23	0.028
23	21	Pipe 27	460	6	140	-304.18	3.45	7.13	0.019
21	18	Pipe 29	713	6	140	-329.58	3.74	8.28	0.019
15	14	Pipe 31	235	6	140	256.03	2.91	5.19	0.02
14	13	Pipe 32	610	6	140	246.23	2.79	4.82	0.02
12	11	Pipe 35	480	6	140	-122.15	1.39	1.32	0.022
11	10	Pipe 36	240	6	140	-131.35	1.49	1.51	0.022
33	10	Pipe 37	250	6	140	-136.72	1.55	1.62	0.022
2	34	Pipe 40	1690	8	140	-1454.54	9.28	31.87	0.016
36	2	Pipe 42	650	8	140	-279.06	1.78	1.5	0.02
7	37	Pipe 43	510	6	140	455.42	5.17	15.07	0.018
37	8	Pipe 44	230	6	140	-982.45	11.15	62.57	0.016

Start Node	End Node		Length	Diameter	Roughness	Flow	Velocity	Unit Headloss	Friction Factor
26	16	Pipe 45	1260	6	140	-249.64	2.83	4.95	0.02
16	15	Pipe 30	1030	6	140	-452.28	5.13	14.87	0.018
15	38	Pipe 46	400	6	130	-722.71	8.2	40.65	0.019
13	12	Pipe 47	800	6	140	233.83	2.65	4.38	0.02
12	18	Pipe 48	1180	6	140	336.57	3.82	8.61	0.019
28	7	Pipe 49	930	6	140	-376.57	4.27	10.59	0.019
30	31	Pipe 50	320	6.4	120	-774.75	7.73	39.16	0.023
25	35	Pipe 14	990	12	140	-1013.71	2.88	2.27	0.018
34	25	Pipe 15	40	8	140	-981.71	6.27	15.39	0.017
25	39	Pipe 20	690	8	140	32	0.2	0.03	0.028
42	40	Pipe 33	600	8	130	123.62	0.79	0.38	0.026
42	40	Pipe 39	600	8	130	349.21	2.23	2.6	0.022
40	34	Pipe 51	50	8	140	472.83	3.02	3.98	0.019
37	45	Pipe 54	760	10	130	1434.67	5.86	12.02	0.019
45	30	Pipe 55	610	10	130	-1135.33	4.64	7.79	0.019
36	10	Pipe 13	460	4	140	272.06	6.95	41.82	0.019
1	22	Pipe 23	860	12	140	793.75	2.25	1.44	0.018
22	23	Pipe 28	1000	10	9780	793.75	3.24	0	0
32	46	Pipe 34	600	8	140	793.75	5.07	10.38	0.017
43	41	Pump 52	#N/A	#N/A	#N/A	349.21	0	-602.9	0
44	42	Pump 53	#N/A	#N/A	#N/A	123.62	0	-548.57	0
46	31	Valve 10	#N/A	8	#N/A	793.75	5.07	57.74	0

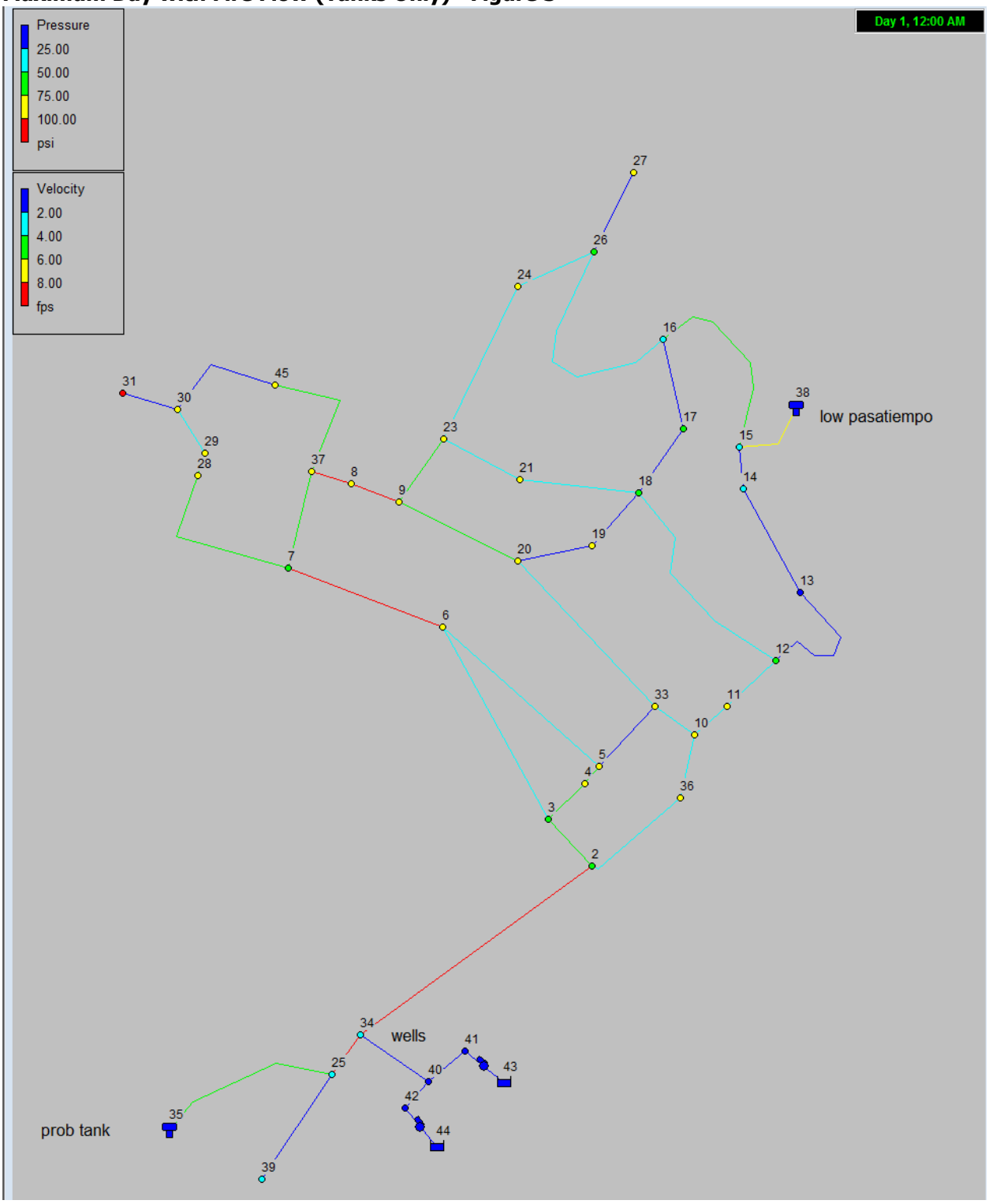
Peak Hour Demand without Fire Flow—Figure 1



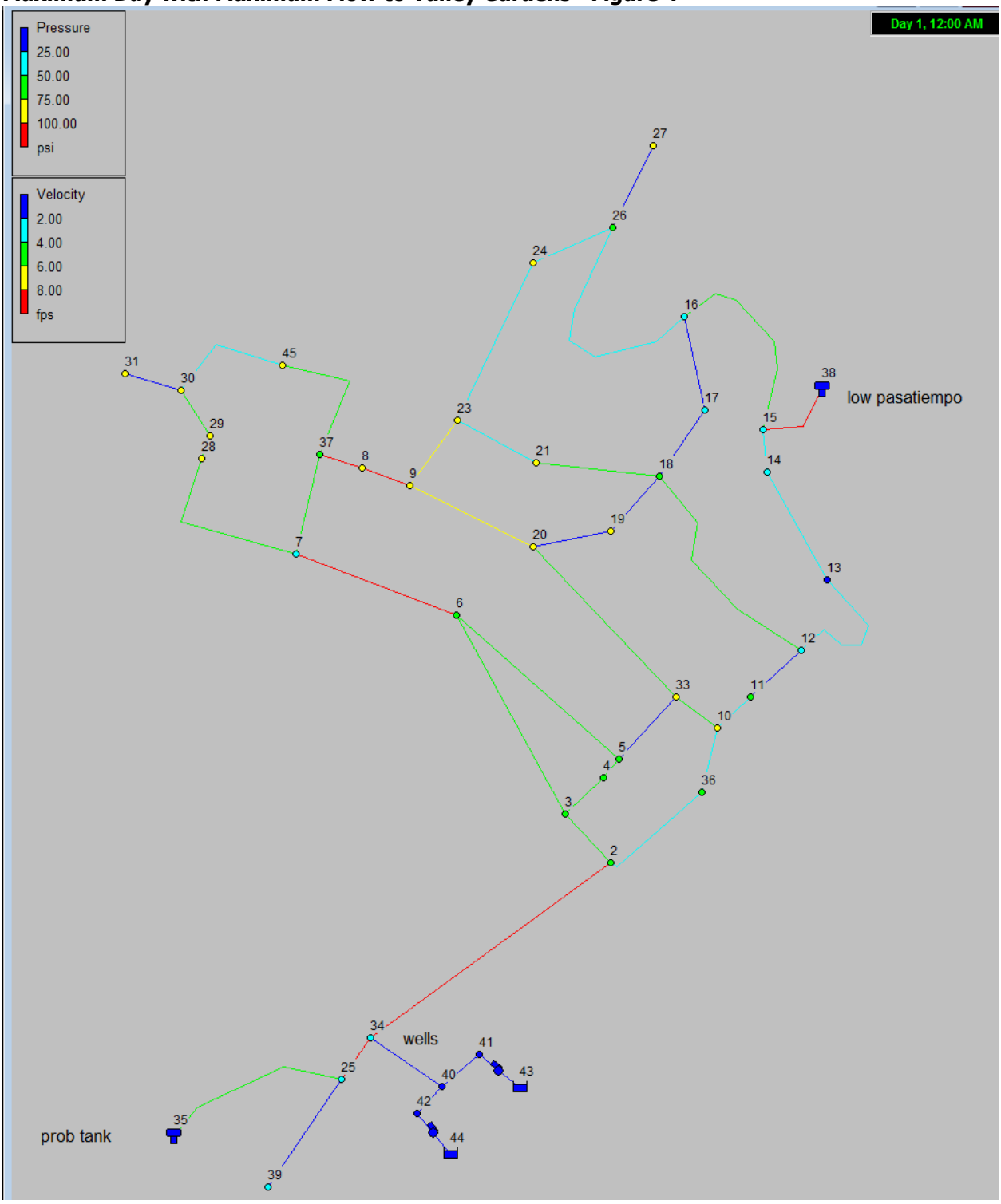
Maximum Day Demand with Fire Flow—Figure 2



Maximum Day with Fire Flow (Tanks Only)—Figure 3



Maximum Day with Maximum Flow to Valley Gardens—Figure 4



NOSSAMAN LLP | Memorandum

TO: Board of Directors,
San Lorenzo Valley Water District

FROM: Gina R. Nicholls, District Counsel

DATE: February 21, 2019

RE: Closed Session Documents

RECOMMENDATION

Continue the District's practice of generally not including in public Board packets the documents that are provided to the District's Board pursuant to a properly agendized closed session meeting.

Alternatively, the Board may decide to release certain closed session materials. Depending on the circumstances, doing so may waive confidentiality and/or privilege, and accordingly, such a decision should be narrow in scope and made only after careful consideration.

For example, rather than making a policy decision that may have presently unforeseeable consequences, the Board could vote in any given closed session meeting to make certain documents available to the public following the closed session. That decision would be announced out of closed session.

BACKGROUND

Not all closed session materials are confidential and/or privileged in and of themselves. For example, a closed session meeting could include review and discussion of the following:

- Newspaper article bearing upon a sensitive personnel matter;
- Motion filed in pending litigation;
- Public report pertaining to litigation;
- MLS database research pertaining to confidential real property negotiations;
- Etc.

These types of documents are "public" in the sense that anyone can get copies of them from sources such as public websites and archives. However, the usual practice of a

California public agency is not to make copies of these types of documents available to the public when its board considers them in closed session.

The Brown Act requires public disclosure of open session materials, while specifically exempting most closed session materials, which also have exemptions from disclosure under the Public Records Act (PRA):[1]

> [W]ritings, when distributed to all, or a majority of all, of the members of a legislative body of a local agency by any person in connection with a matter subject to discussion or consideration at an open meeting of the body, are disclosable public records under the California Public Records Act, and shall be made available upon request without delay. However, this section shall not include any writing exempt from public disclosure under Section 6253.5, 6254, 6254.3, 6254.7, 6254.15, 6254.16, 6254.22, or 6254.26.

(Gov't Code, § 54957.5, emphasis added.)

None of this is meant to imply that an otherwise public document becomes confidential when it is provided to the Board as part of a closed session discussion. A public document remains in the public domain and can be obtained in various ways.

However, an agency typically should not disclose an otherwise public document because it was considered in closed session. The distinction is subtle but important. To illustrate this point, consider the following example:

- If a member of the public requests "newspaper articles about SLVWD in 2019," those records are public. If the District has such records, it should provide copies – **including any articles about SLVWD in 2019 that were considered in closed session**.

- On the other hand, if a member of the public requests "newspaper articles about SLVWD in 2019 that were provided to SLVWD's Board for purposes of closed session," the District should withhold any such documents, assuming of course, that they were provided to the Board pursuant to a properly agendized closed session meeting.

FISCAL IMACT:
N/A

STRATEGIC PLAN:
N/A

[1] Most materials provided to the Board for closed session would be protected under Code of Civil Procedure section 2018.030(b) and the corresponding PRA exemption at Government Code section 6254(k), because the particular materials themselves are privileged, or they were selected and assembled for purposes of providing confidential legal advice. There are some exceptions. For example, submitted claim forms (§ 54956.9(e)(3)) and final versions of settlement agreements adopted in closed session must be disclosed. (§ 54957.1(b).)

MEMO

TO: Board of Directors

FROM: District Manager

DATE: February 21, 2019

SUBJECT: Environmental Committee Meeting Suspension

RECOMMENDATION:

It is recommended that the Board of Directors review this memo and provide direction to staff regarding the status of the Environmental Committee pending appointment of a public member (or members).

BACKGROUND AND OVERVIEW:

The Board Policy manual provides for five (5) standing committees. The standing Committees are advisory to the Board with regard to matters within their respective areas of responsibility. The five District standing committees are as follows: Administrative, Budget & Finance, Engineering, Environmental and Lompico Oversight. Standing Committees shall hold meetings at such times, frequency and locations as deemed necessary by consensus of the committee members. Committees are encouraged to meet at least monthly.

Administrative, Budget & Finance, Engineering, Environmental Committees may have no more than two Board Members and at least one Public Member. Currently there are no public members on the Environmental Committee. Board Chair has requested Environmental Committee meetings be suspended until a public member(s) are appointed by the Board. Currently applications are being solicited with filing deadline of February 26, 2019. At this time the District has received two applications and will be agendizing the Environmental Committee appointment(s) on the March 7, 2019 Board of Directors meeting.

MEMO

TO: Board of Directors

FROM: District Manager

DATE: February 21, 2019

SUBJECT: Education Program Grants Suspension of Funding Fiscal Year 2018-19

RECOMMENDATION:

It is recommended that the Board of Directors review this memo and provide direction to staff regarding the status of the District's Education Program Advisory Commission, Education Program Grants Classic Watershed Education Grants, and Data Collection & Restoration Grants for Fiscal Year 2018-19.

BACKGROUND AND OVERVIEW:

On June 5, 2003 the Board of Directors of the San Lorenzo Valley Water District adopted Ordinance No. 100 which established an Education Program Advisory Commission. The duties of the Commissioners are to advise the Board of Directors of the San Lorenzo Valley Water District regarding the selection and allocation of education program grants and/or scholarships, to adopt such rules and regulations for their own guidance as deemed necessary, and to perform such other duties as may be directed by the Board of Directors.

The Education Program Advisory Commission consists of five (5) members. Each member is a registered voter of the San Lorenzo Valley Water District and maintains residency within the geographic boundaries of the San Lorenzo Valley Water District.

The Districts 2018-19 Fiscal Budget provides funding as follows:

Watershed Grants & Data Collection	$15,000
Education Program	$17,000 ($1,100 spent)

Currently there are three (3) vacancies on the commission. If the Board wishes to continue the program, it is recommended that the appointment process be reviewed and the vacancies be filled and the program be implemented per District Ordinance No. 100.

BOARD OF DIRECTORS
PUBLIC EDUCATION FORUM
SAN LORENZO VALLEY WATER DISTRICT
BOULDER CREEK, CALIFORNIA

January 9, 2003

A Public Education Forum of the San Lorenzo Valley Water District was called to order by Dir. Rapoza on Thursday, January 9, 2003 in the District's Operations Building, 13057 Highway 9, Boulder Creek, California at 7:06 p.m.

ROLL CALL:

Roll call showed Dirs. Rapoza, Nelson, Prather, Ross and Vierra present. District Manager Mueller was also present.

APPEARANCE OF INTERESTED CITIZENS: None

NEW BUSINESS:

a. Discussion Regarding the Establishment of Program Policies and Desirable Environmental Educational Activities

Dir. Rapoza asked all individuals in the audience to introduce themselves. The following individuals were present:

1) Fred Mc Phearson, Boulder Creek (long time resident and teacher)
2) Nancy Macy, Boulder Creek (Valley Women's Club Environmental Committee)
3) John Vallen (California State Parks)
4) Alice Townsend (County Office of Education)
5) Tod Landis, Ben Lomond (interested citizen)
6) Skip Matthes, Boulder Creek (interested citizen)
7) Lisa Rudnick, Ben Lomond (Waterman Gap Citizens Advisory Committee)
8) John Armstrong, Felton (San Lorenzo Valley High School)
9) Don Alley (Alley and Associates)
10) Terry Umstead, Felton (San Lorenzo Valley High School Watershed Academy)
11) Kevin Collins, Ben Lomond (Department of Fish and Game Commission)
12) Mary Jo Walker (Valley Women's Club)

Dir. Rapoza informed the audience that the District is holding this Public Education Forum to collect public input regarding the establishment of program policies and desirable environmental educational activities within the community. Dir. Rapoza indicated that the Board would like to implement a program that does not take an enormous amount of staff time.

Dir. Vierra stated that he would like to move forward with implementing a program and not wait another year.

Dir. Nelson agreed with Dir. Vierra and would like to quickly develop some form of pilot project to get off the ground, even if all questions have not been answered. Dir. Nelson would like some questions answered regarding the administration process. Dir. Nelson reminded everyone of the District's Mission Statement. Dir. Nelson felt that environmental education leads to appreciating the roll ecology plays with humans and would support our economy. In addition, Dir. Nelson stated that restoration leads to environmental education and would improve habitat.

Dir. Prather explained the process the Board is considering. The Board is looking for input regarding the program framework that would have a minimum impact on the Board, possibly by appointing a Sub-Committee or Commission. The framework should include eligibility criteria and funding. Dir. Prather would like to receive input from the community on these issues.

Dir. Ross stated that this Board is unanimous with the decision to get something done and have it environmentally effective to our community. Dir. Ross believes that the decisions made should be within the parameter of the District's Mission Statement.

Dir. Rapoza would also like input on things that the District should not consider when establishing an Education Program. Dir. Rapoza read the Mission Statement to the audience.

Terry Umstead would like to have consistent access to available funds. There are many educational and community needs. The main objective would be educating people in the Valley (adults, children and students alike).

Nancy Macy indicated that the program needs to be a community-based effort and agreed with the idea of restoration. Some ideas would be to run ads, advertise at movie theatres, news broadcasts, monthly mailers, utilize CAB for non-native plant removal, hold movie nights and watch videos related to watershed, educate business owners, provide food composts for businesses, provide barriers for turnouts (Cal Trans), have artists and artisans involved in producing plays, help get the word out for free things people can do like

dispose of tires refrigerators, set up a program for best before and after award (clean-up), inform people on the natural history of watershed, provide information on septic tanks, provide people with small scale logging options, implement a live fish cam for biology of creeks, website creative and interactive, radio announcements (young people to create spots), sponsor series of town hall meetings on environmental issues, science camp is great for 6th graders (do it for teenagers and adults). The Valley Women's Club would be available to implement programs and involve people.

John Armstrong stated that he has some very gifted teachers that are good at writing grants; however, he would like to avoid alot of paper work and make it simple for the kids to participate. Mr. Armstrong felt that keeping the projects small would result in a tremendous return.

Don Alley stated that project applications would need to be prioritized. Someone will need to oversee the projects. The Watershed Resources Coordinator will need to be involved to accomplish this task. The money that is being offered has to be spent in a positive way and the criterion used has to be balanced. Mr. Alley liked the idea about the website and the live fish cam.

Fred Mc Phearson stated that education is a very broad subject and the money should be used for educating people in the District. The more people that know about our watershed the better off were going to be. Mr. Mc Phearson agrees with the idea of having ongoing funding. Mr. Mc Phearson stated felt that education needs to be spread throughout the community and he supports the annual Watershed Festival.

Kevin Collins felt strongly about three (3) issues; water conservation during drought periods, educating homeowners about erosion control and educating people regarding debris in the streams. Removing wood from the streams is extremely destructive.

Alice Townsend offered her time and resources for the Education Advisory Committee. Ms. Townsend would like the Board to consider scholarships for children interested in ongoing education and careers in environmental studies.

Lisa Rudnick agreed with Don Alley's concept. Ms. Rudnick indicated that she has tried to interact with Valley Women's Club on various issues and cautioned the Board to be careful. Ms. Rudnick felt that it would be a crime to use Waterman Gap funds for the purpose of educational activities. Ms. Rudnick indicated that she did not trust the Board or the Valley Women's Club and was very frustrated regarding what came of the Waterman Gap property fiasco.

Skip Matthes felt that someone should be responsible for prioritizing the projects. Mr. Matthes disagreed with the concept of the Watershed Resources Coordinator overseeing this program. In addition, he felt that smaller grants were safer than larger grants. Mr. Matthes does not agree that the schools are a safe place to place funding. The institution of public education (schools) is not a safe place and should not be used as a catchall for this funding.

Dir. Vierra suggested that an Education Advisory Committee be appointed by the Board of Directors with each Board member choosing one person to sit on the Committee.

Dir. Rapoza directed staff to agendize this issue for the January 16, 2003 Board of Director's meeting and each Board member should be prepared to appoint one person to sit on the Education Advisory Committee. In addition, the Advisory Committee would then meet with the Education Committee to design the program framework for a Commission and present to the full Board for further discussion.

Dir. Prather would like to keep Board level participation to a minimum.

Lisa Rudnick requested information on how the concept of Education Forum came up. Ms. Rudnick stated that there is a clear conflict of interest between the Board and the Valley Women's Club.

Manager Mueller stated that conflict of interest is clearly defined by Government Code.

ADJOURNMENT:

The Education Forum was adjourned at 9:05 p.m.

Kelly Stephens
District Secretary

BOARD OF DIRECTORS
SAN LORENZO VALLEY WATER DISTRICT
BOULDER CREEK, CALIFORNIA

January 16, 2003

The regular meeting of the Board of Directors of the San Lorenzo Valley Water District was called to order by Dir. Rapoza on Thursday, January 16, 2003 in the District's Operations Building, 13057 Highway 9, Boulder Creek, California at 7:30 p.m.

ROLL CALL:

Roll call showed Dirs. Rapoza, Prather, Ross and Vierra present. Dir. Nelson arrived at 7:32 p.m. District Manager Mueller, Watershed Resources Coordinator Haynes and Counsel Hynes were also present.

MINUTES:

a. Minutes of the Regular Meeting of January 2, 2003

Motion was made by Dir. Ross to approve the Minutes of the Regular Meeting of January 2, 2003.

ROLL CALL:

Ayes:	Ross, Nelson, Prather, Vierra, Rapoza
Noes:	None
Absent:	Nelson

CHANGE IN AGENDA: None

APPEARANCE OF INTERESTED CITIZENS:

Jane Hyde was present to inform the Board that she received a 48-Hour Notice, which one of her goats ate. Ms. Hyde indicated that receiving such a notice, and the thought of being without water, was very upsetting. Jim Hyde presented the Board with a prepared statement regarding past due notification. Mr. Hyde indicated that without water, a house becomes inhabitable and believes San Lorenzo Valley Water District's policy is flawed. Mr. Hyde suggested that the San Lorenzo Valley Water District adopt a policy to personally advise customers of past due notices by a phone call or face to face contact. In addition, Mr. Hyde felt that turning off water is too harsh for many circumstances. Mr. Hyde felt that the only condition to warrant a shut off is if the customer is knowingly delinquent and refuses to pay the bill.

Manager Mueller gave an overview of tagging, billing and collection procedures of the San Lorenzo Valley Water District. In addition, Manager Mueller stated that the District does make payment arrangements on an individual basis and customers are given liberal amounts of time to pay the delinquencies.

Elizabeth Nights asked the Board if the District had the discretion to turn off the water even if people are willing to pay, but can't. Dir Ross indicated that the District does take steps to provide information to delinquent customers on where they can receive help in the event of hardship. Dir. Ross does not want to get into the business of adjudicating if the customer can or cannot pay their bill.

Janet Laidlaw asked the Board who would be responsible if a fire occurs and the water is shut off for non-payment. Legal Counsel Hynes responded that if proper procedures have been followed there would not be a liability on the District.

Gordon Stewart stated that the District is dealing with a small problem for some people and larger for others and a documented procedure should be established.

Pat Dugan stated that a responsible individual should know that they have used water and that a bill is due.

Dir. Nelson stated that he could not perceive a clear problem with the process but a due hardship with individuals within the District. The District could talk to individuals within the community to see if there are programs available that the District could work with within the community. These agencies could be invited to discuss various options and a program can be implemented.

Janet Laidlaw asked the Board to refer to the Mission Statement, "Outstanding Customer Service" and set some boundaries.

Skip Matthes asked the Board to interface with different agencies within the community and develop a Lifeline Program. If customers know that the District is willing to work with them, they may be proactive.

Dir. Vierra is satisfied with the District's procedure as it stands. In addition, the Customer Service Department needs to be refreshed periodically on the standard policy procedures.

Dir. Rapoza stated that this is not an agendized item, but various agencies could be invited to a future meeting to address the hardship needs of the District's customers.

<u>CORRESPONDENCE:</u> None

<u>CONSENT AGENDA:</u> None

UNFINISHED BUSINESS:

a. Education Forum

Manager Mueller stated that the Education Program Citizens Advisory Committee would work with the Education Committee of the Board of Directors to develop recommendations regarding the institutional framework, program eligibility criteria and other such matters relative to the proposed Education Program.

Dir. Ross nominated Hank Helbush to serve on the Education Program Citizens Advisory Committee. Mr. Helbush is an environmental teacher for U. C. Berkeley and is interested in children's knowledge of the environment.

Dir. Vierra nominated Carson Brown to serve on the Education Program Citizens Advisory Committee. Mr. Brown is a special education teacher.

Dir. Prather nominated Tai Stills to serve on the Education Program Citizens Advisory Committee. Ms. Stills is a grant writer by profession with background in watershed and stream issues and environmental restoration.

Dir. Nelson nominated Terry Umstead to serve on the Education Program Citizens Advisory Committee. Mr. Umstead is a teacher for the San Lorenzo Valley High School Watershed Academy.

Dir. Rapoza nominated Connie Benton to serve on the Education Citizens Advisory Committee. Ms. Benton is the Assistant Superintendent for Educational Services with the Santa Cruz County Office of Education.

Lisa Rudnick informed the Board that she did not receive an invitation to the Education Forum. In addition, she reported that one other Waterman Gap Citizens Advisory Committee Member did not receive an invitation. Ms. Rudnick felt that funding education was not good use of District assets.

Elizabeth Knights commented that funding education is a poor way to spend money, expensive and not necessary.

Gordon Stewart commented that the District is not experienced in the education business. Dir. Ross commented that the process was to come up with a funding mechanism and not to be in the education business.

Skip Matthes felt that the money was going to the school system and felt that if the District could afford to give away money it should be given back to customers within the District.

Bruce Oneto commented that the people involved with the referendum on the sale of the Waterman Gap Property wanted to use the property as a schoolyard for restoration, etc. When the property sold, the Board made a decision to put some of the money toward education. The Board is keeping to its commitment to fund activities and education to preserve and upgrade our resources. This region will stand or fall on the health of the watershed.

Dir. Ross felt that investing in people's education is a sensible use of money to promote Water District aims.

Pat Dugan stated that the ratepayers keep the District in business and education should come to the District. The District's business is to supply water, not educate people. Mr. Dugan recommended using the District's Annual Newsletter to educate the public. Mr. Dugan felt that using the funds for education would be misappropriating funds. Mr. Dugan urged the Board not put ratepayer money into a program that the District has no idea how to manage.

Nick Vrolyk reported that alot of programs have potential problems. It is important to have opposite points of view on the Education Program Citizens Advisory Committee for balance. In addition, logging issues need to be taught to children so they do not form an unbiased opinion.

Joel Pettenissi urged the Board to forget putting the money into education, as there is much better use for the money. The Water District has no business being in the education business. Mr. Pettenissi stated that the educational system in this country sucks.

Gordon Stewart urged the Board to bring the educational funding issues to the voters and ratepayers and prove to the people that this Board will give the citizens a vote on the Board’s decisions.

Mr. Hyde made an observation that only one nominee for the Education Program Citizens Advisory Committee was present and left before public input. Mr. Hyde would hope that the nominees would at the least read the minutes from this meeting before they meet.

Ms. Rudnick repeated that the proposed education program is a misuse of District funds. The Waterman Gap Citizens Advisory Committee wanted to maintain management of the property and felt that a majority of this Board

has a political agenda. Ms. Rudnick urged the Board not to proceed with the proposed education program. Ms. Rudnick does not like the idea of the Water Board of political leanings having any control over any school functions. Ms. Rudnick stated that this Board took away peoples property rights and has seen people very hurt because decisions this Board has made.

Daniel Beckett stated that it would be logical to have a rebate to ratepayers if excess funds are available.

Mr. Pettenissi asked if the customers could amend the District's Board Minutes. Legal Counsel Hynes stated that customers could not amend the District's Board Minutes. Mr. Pettenissi would like the record to show that he doesn't agree that customers are not allowed to make changes to the District's Board Minutes. In addition, Mr. Vrolyk would like the record to show that he would like to have a copy of the tape recorded minutes. Legal Counsel Hynes informed Mr. Vrolyk that there would be a charge.

Dir. Rapoza directed staff to contact all members and schedule a meeting with the Education Program Citizens Advisory Committee and the Board of Director's Education Committee.

Dir. Vierra stated that he was not comfortable moving forward with this Education Program if the people in the community do not want it. Dir. Vierra commented that everyone in the audience has been negative about a good thing that the Board is trying to do.

Janet Laidlaw asked the Board to put it to the people if this is the type of program they want.

Skip Matthes is concerned that the educational community are the only individuals involved in this program. If these are the same individuals appointed to the Commission it would be a one sided program.

Elizabeth Knights reported that education is a noble goal; however, the groups that have submitted information foremost are not to educate individuals but to politically motivate individuals.

Dir. Vierra felt that the two (2) committees were not ready to meet. This is not a positive environment to bring in an Education Program Citizens Advisory Committee. Since there is no support tonight, the issue needs to be posed to the public more. Dir. Vierra withdrew his committee member nomination.

Dir. Rapoza is ready to move forward with the Education Program Citizens Advisory Committee. Dir. Ross stated that the Board has seen the radical extreme of the political spectrum from both meetings and is also ready to move forward with the Education Citizens Advisory Committee. Mr. Dugan requested that the Board Minutes show Dir. Ross' comment.

Ms. Rudnick felt that Board members at this meeting and last weeks meeting were verbally abusive. Ms. Rudnick felt that the Board should not be verbally abusive or belittle persons that are in the audience to make their point of view known.

Motion was made by Dir. Ross to appoint Hank Helbush, Carson Brown, Tai Stills, Terry Umstead and Connie Benton to the Education Program Citizens Advisory Committee:
ROLL CALL:

Ayes:	Ross, Nelson, Prather, Rapoza
Noes:	None
Abstain:	Vierra

NEW BUSINESS:

a. Nomination for Special District LAFCO Representation

Manager Mueller stated that LAFCO is calling for nominations to fill two (2) special district terms on LAFCO. Dir. Rapoza would appreciate the Board's reelection to fill this term from May 5, 2003 through May 7, 2007.

Motion was made by Dir. Ross to appoint Dir. James Rapoza for Special District LAFCO Representation.
ROLL CALL:

Ayes:	Ross, Nelson, Prather, Vierra, Rapoza
Noes:	None
Absent:	None

Dir. Rapoza stated that a meeting has been scheduled for March 24, 2003 for LAFCO nominations and a Board member needs to be elected to cast the vote. Dir. Rapoza directed staff to put on the agenda for the first meeting in March 2003.

REPORTS:

a. Manager

(1) Bill List through January 16, 2003

Motion was made by Dir. Vierra to approve the Bill List in the amount of $116,682.34.

ROLL CALL:

Ayes:	Vierra, Nelson, Prather, Ross, Rapoza
Noes:	None
Absent:	None

(2) Cash Flow, December 2002

The Board received the Cash Flow, December 2002.

(3) Investment Report

The Board received the Investment Report.

(4) One Time Leak Adjustment Status report
October 1, 2002 - December 31, 2002

The Board received the One Time Leak Adjustment Status Report October 1, 2002 - December 31, 2002.

(5) Department Status Reports

The Board received the Department Status Reports.

(6) Committee/Director Reports (Oral)

Manager Mueller, Dir. Rapoza and Dir. Ross met with Supervisor Almquist regarding Cal-Am. It was determined that that Felton customer's cannot legally vote without forming some form of legal entity. Alternative options are being explored to form a CSA. The deadline to get on the next ballot would be June 6, 2003. Another meeting will be scheduled with Supervisor Almquist to discuss formation of a CSA.

Two (2) PUC Rate Case Hearings will be heard on January 29, 2003 in Felton.

INFORMATIONAL MATERIAL:

a. AB 1945 Ralph M. Brown Act Amendment

The Board received AB 1945 Ralph M. Brown Act Amendment.

ADJOURNMENT TO CLOSED SESSION:

Dir. Rapoza adjourned the meeting to closed session at 10:21 p.m. to approve the Minutes of the Closed Session Meeting of January 2, 2003 and to confer with Legal Counsel - Anticipated Litigation, Significant Exposure to Litigation Pursuant to Subdivision (c) of Government Code Section 54956.9-One (1) Potential Case and to Confer with Real Property Negotiator, Property: APN 81-361-02, Negotiating Parties: James Mueller, District Manager and Ikey Little, Under Negotiation: Price and Payment Terms.

RECONVENE TO OPEN SESSION TO REPORT ACTIONS TAKEN:

a. Minutes of the Closed Session Meeting of January 2, 2003

Motion was made by Dir. Rapoza to approve the Minutes of the Closed Session Meeting of January 2, 2003.

ROLL CALL:

Ayes:	Rapoza, Nelson, Prather, Ross, Vierra
Noes:	None
Absent:	None

b. CONFERENCE WITH LEGAL COUNSEL - ANTICIPATED LITIGATION
Significant Exposure to Litigation Pursuant to Subdivision (c) of Government Code Section 54956.9:
One (1) Potential Case

No reportable action.

c. CONFERENCE WITH REAL PROPERTY NEGOTIATOR
Property: APN 81-361-02
Negotiating Parties: James Mueller, District Manager and Ikey Little
Under Negotiation: Price and Payment Terms

No reportable action.

ADJOURNMENT:

The meeting was adjourned at 11:50 p.m.

Kelly Stephens
District Secretary

MEMO

To: Board of Directors

From: District Manager

Date February 21, 2019

Subject: San Lorenzo Valley Water District Strategic Plan Review

RECOMMENDATION:

It is recommended that the Board of Directors review this memo and the attached San Lorenzo Valley Water District Strategic Plan and discuss updating the plan and provide staff direction.

BACKGROUND AND OVERVIEW:

Strategic plan serves as a framework and basis for decision making and detailed planning over an extended period of time. As a top level planning document, a strategic plan confirms the overall mission for an organization, affirms the vision by looking out into the future, assesses core values as how an organization will do business, and creates a roadmap of actions and activities to best position for continued mission success.

The Districts current 2016 strategic plan was approved December 2016. The strategic elements in this plan are as follows;

1. Water Management
2. Watershed Stewardship
3. Capital Facilities
4. Wastewater Management
5. Fiscal Planning
6. Public Affairs
7. Strategic Partners
8. Organizational Health/Personnel
9. Administrative Management

The strategic plan has not been reviewed since approved and review and update is recommended. The majority of the Board members have changed since the plan was adopted in 2016. Lompico consolidation and Santa Margarita Groundwater Agency are not included in the plan. Progress has been made in several areas, including the completion of the North South Intertie.

In the past the District has used a consultant to facilitate the planning and development process in revision of the strategic plan. This included community meetings to gather input from the public, meetings with individual Board Members and staff. The 2015 revision was completed at a cost of approximately $7,500.

It is recommended that the Board of Directors review this memo, attachments and discuss updating the San Lorenzo Valley Water District's Strategic Plan and provide staff direction.

San Lorenzo Valley Water District

2016 Strategic Plan
Approved 12/01/2016

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 watershed; and to ensure the fiscal vitality of the San Lorenzo Valley Water District.

Introduction

Acknowledgements

This Strategic Plan is a collaborative effort involving many individuals; Directors, public, staff and consultants. A most prominent 'Thank You" goes out from the District to Mr. Brent Ives, BHI Consulting. Mr. Ives provided key guidance during the creation of the 2015 Strategic Plan, the strong foundation of our District's future efforts.

What is a Strategic Plan?

A Strategic Plan is the top level planning document for an organization to set clear direction over all operational aspects of its mission. It serves as a framework for decision making over a rolling five-year period. It is a disciplined effort to produce fundamental decisions that shape what a District intends to accomplish by selecting a rational and balanced course of action. At its highest level, this Strategic Plan seeks to strengthen and build upon opportunities while addressing areas of concern all aimed toward forecasting an optimized future condition. A large part of its intended use is to clarify the future for the Board, Staff, and the public.

The District has made a conscientious decision to actively review and adjust its Strategic Plan on a yearly basis. Each year the Board of Directors will review and update the Strategic Plan, where new items may be added and prioritized, completed work will be acknowledged and archived, and items may be removed or re-prioritized. The District recognizes that there are many plans and projects that will require more than five years to accomplish.

The District is committed to conducting the work of prioritizing, planning and implementing Strategic Plan projects in an inclusive and transparent manner. We welcome and encourage input from the entire San Lorenzo Valley Water District community.

This document will introduce each important strategic goal, actions and initiatives in each of the strategic elements.

Introduction

Strategic Elements

Strategic Elements represent the vital areas of the District's operation and management. Thorough analysis of each area assures that implementation fully supports the Mission and Vision in a comprehensive way, properly covering the District in all areas. As such, Strategic Elements are supportive of the foundational Mission and Vision statements of the District.

The Strategic Elements are as follows:

1. Water Management
2. Watershed Stewardship
3. Capital Facilities
4. Wastewater Management
5. Fiscal Planning
6. Public Affairs
7. Strategic Partners
8. Organizational Health/Personnel
9. Administrative Management

Introduction

Board Vision Statement

The San Lorenzo Valley Water District has committed to the following courses of action:

Every December 31st we will have:

- Completed a review of our 5-year Capital Improvement Program.
- Successfully connected with our communities.
- Cooperated with other agencies.
- Remained successful in watershed stewardship.

By December 31, 2016 we will have:

- Achieved water conservation levels such that we are in the top 10% of California Water Districts for conservation as a percentage of 2013 consumption levels,
- A Staffing Plan that will achieve appropriate service and maintenance levels by 2020.
- A Capital Improvement Program that is flexible and achievable, detailing projects and milestones.
- Successfully implemented a Water Audit and Loss Control Program reducing water loss through leakage

By December 31, 2017 we will have:

- A balanced budget that reflects Mission needs,
- A rate study of our wastewater system and a plan to fully fund required operations and maintenance. or we have transferred our wastewater responsibilities to another agency or JPA.

By December 31, 2018 we will have:

- We have completed the Probation Tank Replacement Project,

By December 31, 2019 we will have:

- Reduced our carbon footprint as well as maintained our commitment to compliance with AB-32.

By December 31, 2020 we will have:

- Completing environmental review, design, finance planning and construction-ready plans for utilizing Loch Lomond water.
- Adequate staffing at all levels as defined by the 2016 Staffing Plan.
- A redundant Quail Hollow Well Project.

Introduction

Accomplishments

In 2015 we:

- Achieved a yearly 24.9% reduction in water consumption compared to 2013 levels, placing SLVWD above the 90th percentile for state water district's conservation efforts in 2015.
- Reviewed our Capital Improvement Program, establishing prioritization of planned projects
- Reviewed and Re-Codified Ordinance 8 into four documents:
    - Rules and Regulations
    - Policies and Procedures
    - Schedule of Rates and Charges
    - Definitions
- Successfully connected with our communities through public budget meetings, CIP public meetings, workshops and symposiums, Social Media and Newsletters, and a variety of published opinion pieces and guest articles in local papers.
- Cooperated with other agencies through joint meetings with Scotts Valley Water District, collaborative efforts with the Fall watershed symposium, among others.
- Successfully implemented a water audit and loss control program, reducing our water loss through leakage by 60,000 gallons

In 2016 we:

- Completed the North-South Intertie Project.
- Completed both the 2010 the 2015 Urban Water Management Plans.
- Successfully transitioned Lompico County Water District into the District service area.
- Funded educational projects that enhance the understanding of the San Lorenzo River watershed or improve the watershed's environmental health.
- Collaborated with other agencies and local stakeholders on large landscape and water resource stewardship efforts across the San Lorenzo Watershed

1.0 Water Supply Management

Objective

To ensure water supplies of high quality and quantities are available for existing and future customers. We will do this by responsibly managing all water and watershed resources under the District's control, developing a diversified water supply, and by partnering with and/or influencing agencies that have an impact on the quantity and quality of current and supplemental water supplies available to the District.

5-Year Strategic Goals:

1.1 North - South Intertie
1.2 Redundant Quail Hollow Well
1.3 Water Sources
1.4 Water Audit and Loss Control Program
1.5 Felton Infrastructure and Source Water

1.0 Water Supply Management

1.1 North/South Intertie

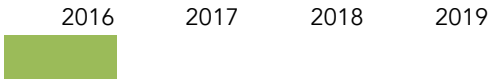
Currently, the District is comprised of three totally independent water systems: the Northern Distribution System located in the San Lorenzo Valley (Boulder Creek, Brookdale, Ben Lomond, Lompico and Zayante), the Southern Distribution System located in the Scotts Valley area, and the Felton System located in Felton. These three independent water supply and distribution systems are interconnected through intertie pump stations. Currently, the pump stations are available for emergencies only. Free interconnection of the systems would allow for increased reliability and allow the South Distribution System to utilize surplus surface water from the Northern Distribution System during the winter months of normal rainfall years, managing the District's groundwater aquifers through conjunctive-use

Within five years, the District will undertake a CEQA review to utilize the North/South Intertie for enhanced water resource management activities such as the utilization of surface water as a water supply source in the Southern Distribution System for in-lieu groundwater aquifer recharge.

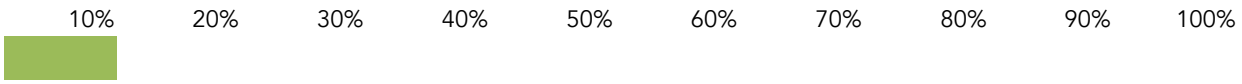
SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: 2018

START DATE: 2016 COMPLETION DATE:

Schedule:



Progress:



STATUS:

03/07/2016 – District staff is preparing budget costs for inclusion in the 16/17 budget year. District staff is analyzing water budgets for each of the three water systems to develop conceptual conjunctive use water transfer quantities.

Summer 2016 – District staff submitted a grant application, in conjunction with the County of Santa Cruz, to conduct appropriate CEQA Study required to lift 'emergency' restriction from intertie use.

1.2 Redundant Quail Hollow Well

1.0 Water Supply Management

The District always strives to properly manage the groundwater aquifers from which it draws. The District operates and maintains two (2) groundwater wells in the Quail Hollow area (Quail Hollow Well No. 4A and Quail Hollow Well No. 5A) of the District's Northern Distribution System. It is assumed that all work activities associated with the Quail Hollow Redundant Well Project would be funded as a budgeted capital outlay project in a future District Annual Budget. At this time, this project is assumed to be a "pay-as-you go" project funded by ongoing revenues received from District water sales and other fees and charges. It is estimated that it would take approximately 36 months to complete the proposed Quail Well Project (Design, CEQA, Permitting, and Construction).

SCHEDULED START YEAR: 2017 EST. COMPLETION YEAR: 2020

START DATE: COMPLETION DATE:

Schedule:

2017 2018 2019 2020

Progress:

10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

STATUS:

Not Started

1.0 Water Supply Management

1.3 Water Sources

The District owns source water rights on multiple streams within San Lorenzo Valley. Additionally, the District has an historical contractual allocation to purchase up to 313 acre-feet per year of raw water from Loch Lomond Reservoir which is owned and operated by the City of Santa Cruz. The District has not utilized Loch Lomond as a source of supply since the late 1970's. A number of project alternatives and accompanying steps exist to revitalize this source of water supply.

The District also owns and operates multiple wells within local groundwater basins. Historically, the groundwater basins utilized by the District have experienced overdraft and the current groundwater levels remain below historical norms.

Groundwater represents the District's only long-term water storage. Reduced groundwater levels cripple the District's ability to withstand prolonged drought events. Environmentally, lower groundwater levels inhibit groundwater contributions to stream flows.

The District desires to utilize winter flows from available stream diversions and available Loch Lomond water in a conjunctive fashion with available groundwater.

Short Term Goal: Diverting winter flows/Loch Lomond water for use in areas normally reliant on groundwater (South Zone and Manana Woods) provides in-lieu recharge of the groundwater basin.

Long Term Goal: Treatment and storage of available winter/Loch Lomond water in local groundwater basins.

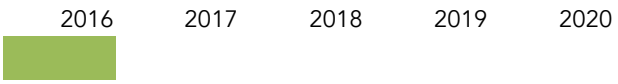
Within the scope of this five-year plan, the District anticipates starting a conjunctive use project to achieve the short-term goal of in-lieu recharge, with steps such as environmental review, design, finance planning and completion of construction ready plans.

1.0 Water Supply Management

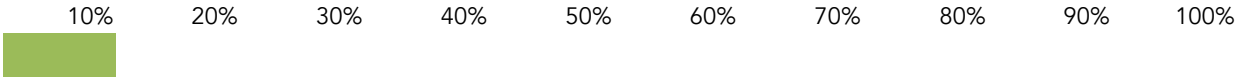
SCHEDULED START YEAR: 2016 EST. COMPLETION YEAR: 2020

START DATE: 2016 COMPLETION DATE:

Schedule:



Progress:



STATUS:

03/09/2016 - District staff is preparing budget costs for inclusion in the 16/17 budget year. District staff is analyzing water budgets for each of the three water systems to develop conceptual conjunctive use water transfer quantities.

Summer 2016 – In collaboration with the County Water Resources Department, staff has applied for grant funding to fund a conjunctive use plan which would include utilization of Loch Lomond to enhance stream flow in Fall Creek.

Fall 2016 – District staff is engaged in discussions with the City of Santa Cruz, Scotts Valley Water District and Soquel Creek Water District to discuss local projects viewed through a regional lens. District's use of Loch Lomond water is a part of the discussions.

1.0 Water Supply Management

1.4 Water Audit and Loss Control Program

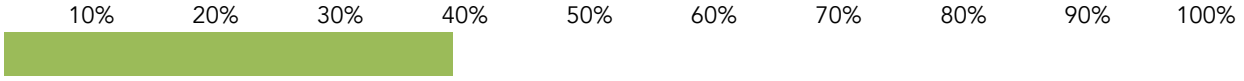
To provide water service to customers the District conveys water through approximately 150 miles of various sizes and ages of water mains. Water loss through mainline leakage can be as high as 20 percent of total water production in an older distribution system such as the District's. To ensure that the District is using its water supplies efficiently, the District will implement a Water Audit and Loss Control program over the next five years that will, conduct a water audit to assess the efficiency of the water distribution system, perform leak detection, identify leaks throughout the distribution system and facilitate repairs, control apparent losses in metering and billing to recover missed revenues and develop approaches for short-term and long-term goal setting for the loss control program.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: 2020

START DATE: 2016 COMPLETION DATE:

Schedule:

Progress:



STATUS:

03/09/2016 – District conducted first round of leak detection in 2015. District inspected 150 miles of pipeline and repaired 59 previously unknown leaks totaling an estimated 111 gpm (58 MGY). Staff is anticipating a second round of leak detection in the 2017-18 budget year.

1.0 Water Supply Management

1.5 Infrastructure and Source Water

The District conveys water through approximately180 miles of various sizes and ages of water pipe and appurtenant facilities, including stream/spring diversions, wells and potable water treatment plants.

District infrastructure and water sources are constrained and restricted due to age and deferred maintenance.

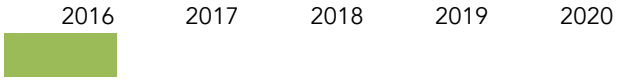
Within the next five years the District would like to develop an Infrastructure Master Plan Area that addresses replacement of infrastructure that has reached the end of its useful life.

Within the next five years the District would like to develop a Source Water Master Plan that provides clear goals and objectives to ensure safe and reliable sources of.

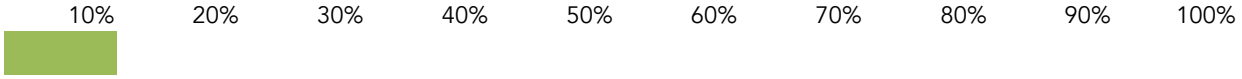
SCHEDULED START YEAR: 2016 EST. COMPLETION YEAR: 2020

START DATE: 2016 COMPLETION DATE:

Schedule:



Progress:



STATUS:

03/09/2016 – District staff is preparing budget costs for inclusion in the 16/17 budget year.

2.0 Watershed Stewardship

Objective:

To manage and protect the environmental health of the local aquifers and watersheds.

Summary of 5-year strategic goals:

2.1 Watershed Management Plan
2.2 Environmental Review of Impacts to San Lorenzo River Watershed
2.3 Climate Action Plan
2.4 Education Program

2.0 Watershed Stewardship

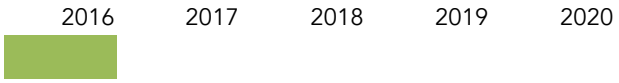
2.1 Watershed Management Plan

In 2006 the District began to prepare an update to the existing Watershed Management Plan from 1985 including changes in the districts land ownership and service area, changes in watershed conditions, advances in watershed science and habitat restoration, and changes in regulatory requirements. Over the next five years staff will evaluate and identify data gaps and complete the districts Watershed Management Plan.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: 2020

START DATE: 2016 COMPLETION DATE:

Schedule:



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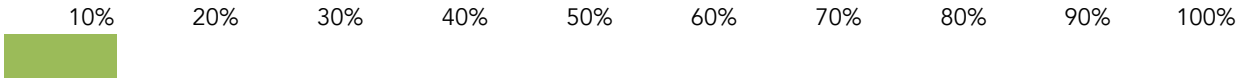


STATUS:

Summer 2016- Completed the Plan to Control Invasive Broom and Acacia on the Olympia Watershed

2.0 Watershed Stewardship

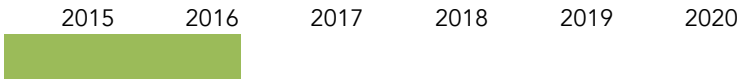
2.2 Environmental Review of Potential Impacts to the San Lorenzo River Watershed

Human-induced disturbances in the San Lorenzo River Watershed have altered hydrologic processes by increasing the magnitude and frequency of peak discharges and reducing summer base flows. Urban and rural development is a major source of erosion and sedimentation. Many current and historic human-induced impacts in the San Lorenzo River watershed cause or exacerbate erosion and sedimentation. These impacts to the San Lorenzo River watershed directly impact the San Lorenzo Valley Water District and its community. The District has a long history of watershed stewardship, providing environmental review and comments to proposed projects and plans, which impact the watershed. In the next five years, the District will continue to conduct environmental review on timber harvest, agriculture and development projects that impact the District's water sources and the San Lorenzo River Watershed.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:



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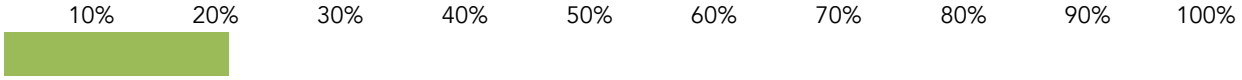


STATUS: 2016 – District has actively engaged in public discussions regarding the Mount Herman Activity Bike Park and the County Cannabis Cultivation Ordinance creation, timber harvest operations that impact District water resources.

2.0 Watershed Stewardship

2.3 Climate Action Plan

In 2008 the District Board approved a climate change resolution committing itself to meeting greenhouse gas emissions to AB32 standards. In addition, the resolution committed the District to addressing potential impacts of climate change in all of its planning documents.

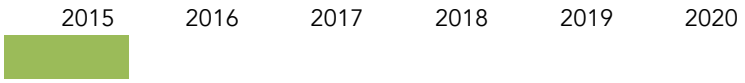
In addition to maintaining the District's participation in the Climate Action Registry through regular emissions inventory reporting, the District will include consideration of additional climate change mitigation and adaptation measures in its ongoing operations, including such actions as: energy efficiency, fuel efficiency, encouraging water conservation, use or purchase of renewable energy generation, carbon sequestration, ongoing watershed stewardship and improved water supply resiliency.

Within five years, the District will have: evaluated the potential for and economic viability of additional renewable energy generation on District property, evaluated the potential costs and benefits of becoming 'carbon neutral' or 'carbon free' and if feasible, bringing forward a proposal to reach that goal. Within five years the District will have consulted with local and state experts on climate change impacts and will have incorporated appropriate adaptation considerations into our Watershed Management Plans.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:



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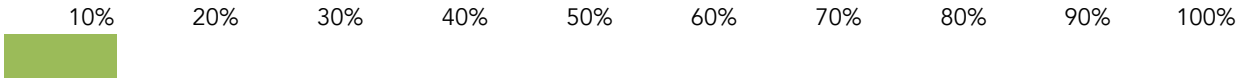


STATUS: 2016 – District has begun reviewing alternative energy options for the Bull/Bennett Pipeline. Staff has begun reviewing battery storage options to offset peak usage and reduce carbon footprint.

2.0 Watershed Stewardship

2.4 Education Program

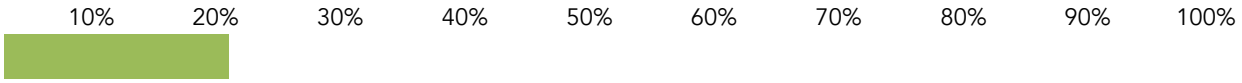
To protect the District's water resources over the long term, it is important to raise awareness of water conservation, and watershed protection and stewardship among residents of and visitors to the San Lorenzo Valley River watershed. The mission of the District's Education Program is to provide funding for educational and other projects that enhance the understanding of the San Lorenzo River watershed or improve the watershed's environmental health. Over the next five years, the District will continue to implement both of the education grant programs: the "classic" program and the "data gaps" program, refining them as necessary. Additionally, the District and its Mission has a fascinating history, one that is relevant to today and the future. As such, it is important to share that story.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:

Progress:



STATUS:

2016 - Six Classic Watershed Education Grants are funded annually. Community members, teachers, and nonprofits received grants to fund educational programs which have successfully reached students in every public school in the San Lorenzo Valley.

Monthly newsletters with articles regarding water conservation, watershed stewardship and environmental activities and announcements are distributed to the community via email

3.0 Capital Facilities

Objective:

Properly managing our infrastructure through appropriate maintenance, yearly system condition review and assessment and timely replacement of facilities that have reached or exceeded the end of their service life.

Summary of 5-Year Strategic Goals:

3.1 Capital Improvement Program

3.0 Capital Facilities

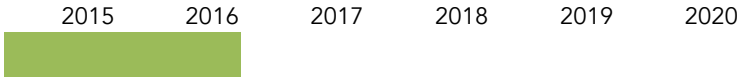
3.1 Capital Improvement Program

The District has an ongoing Capital Improvement Program. The project planning and development process of the Capital Improvement Program was established to provide and orderly procedure for the identification, evaluation and prioritization or current and future capital needs of the San Lorenzo Valley Water District. The Capital Improvement Program has been utilized to guide the District's long and short-range planning process by matching identified needs, desired priorities and major capital expenditures. The 2010 Capital Improvement Program lists $27,455,000 dollars of needed improvements. Over the next five years The 2010 Capital Improvement Program will be updated and progress will be published on the District's website describing the schedules for individual projects by activity, processing time frame and estimated costs for each of the on the projects that are anticipated to be completed over the five years.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:



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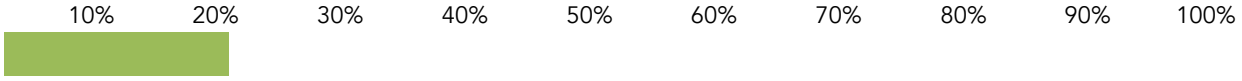


STATUS: 2016 – District published a ten-year Capital Improvement Plan, including project descriptions and individual project budgets.

4.0 Wastewater Management

Objective:

Properly managing our wastewater operation until the successful transition to a more appropriate entity is achieved. We will work with our wastewater customers and potential successor entities to find a beneficial solution.

Summary of 5-Year Strategic Goals:

4.1 Bear Creek Wastewater Collection and Treatment System

4.0 Wastewater Management

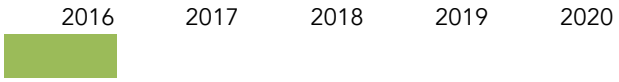
4.1 Bear Creek Wastewater Collection and Treatment System

The District currently owns and operates the Bear Creek Estates Wastewater System which provides wastewater collection and treatment service to approximately 54 single family residences. The District desires to transfer ownership and operation of the wastewater system to a more appropriate agency, such as the County of Santa Cruz, which could operate the system more efficiently. The District will continue to seek resolution of this matter with the County. In the next five years, specific steps toward this goal could include: conducting a rate-study that will establish operational and capital needs of the wastewater system, conduct a Proposition 218 rate increase process that will set rates appropriate to the operational and capital needs of the system, establishing a community dialog with Bear Creek Estates residents, meeting with County representatives on a regular basis to discuss and move this idea forward, and collaboratively establishing a plan with a schedule and key milestones.

SCHEDULED START YEAR: 2016 EST. COMPLETION YEAR: 2020

START DATE: 2016 COMPLETION DATE:

Schedule:



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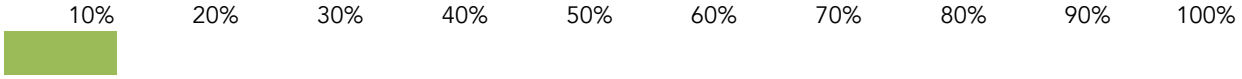


STATUS:

2016 – District is completing a wastewater cost-of-service study.

5.0 Fiscal Planning

Objective:

To ensure the short and long-term fiscal vitality of the District. The District will forecast and plan income, reserves and expenditures and provide financial resources sufficient to fund on-going operations and the capital improvement program (CIP).

Summary of 5-Year Strategic Goals:

5.1 Fiscal Plan for Support of Strategy
5.2 Funding Infrastructure Replacement
5.3 Provide Support for Applying for and Securing Grants
5.4 Obtain the Comprehensive Annual Financial Report (CAFR) Award
5.5 Annual Review of the Reserve Fund Policy
5.6 Fiscal Transparency

5.0 Fiscal Planning

5.1 Fiscal Plan for support of Strategy

The District will continue to prepare and adopt annual balanced budgets, which reflect the mission of the District. The maintenance of this Strategic Plan will be integrated into the annual budgeting process. Additionally, it is anticipated that those goals, actions and/or initiatives outlined within this Plan will be reviewed and considered for funding as each annual budget is developed.

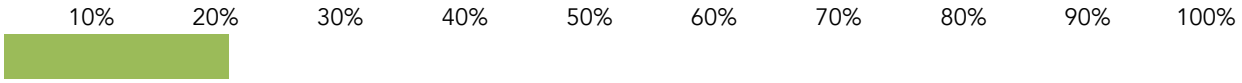
The District will conduct a multi-year rate study that will take into consideration as a minimum: continued fiscal impact of the drought, projected operational and staffing needs, conservation incentives, fixed rates vs. commodity rates, capital funding needs, and reserves.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:

Progress:



STATUS:

2016 – District is completing a cost-of-service study.

5.0 Fiscal Planning

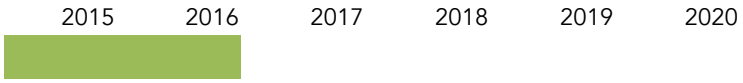
5.2 Funding Infrastructure Replacement

The District's ongoing fiscal planning activities will include periodic comprehensive analysis of the infrastructure needs of the District. These are generally outlined in the Capital Improvement Program (CIP). Each year during the budget development process, the capital improvement needs will be considered for inclusion within the upcoming budget for either full or incremental funding.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:



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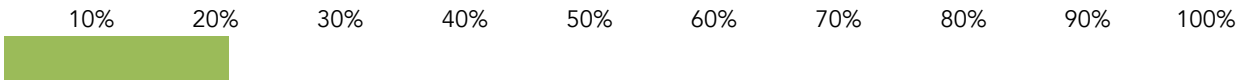


STATUS:

2016 – CIP projects were included in District's budget for the next fiscal year. District applied for two State Revolving Fund loans; one for Probation Tank Replacement project and one for Swim Tank Replacement project.

5.0 Fiscal Planning

5.3 Provide Fiscal Support for Applying for and Securing Grants

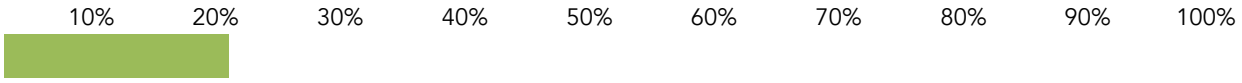
Securing grants for various projects within the District is a best practice and leverages District monies, and thus protects rates. The District will determine proper funding and assistance necessary to support an organized effort to seek out and secure grants as project specific revenues for the District.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:

Progress:



STATUS:

2016 – District applied for two grants; one to conduct an analysis and to plan to conjunctively utilize water resources through the intertie project, to reduce aquifer overdraft and increase stream flow in Fall Creek and the San Lorenzo River during dry periods. The 2nd grant is a collaborative effort to enhance fish habitat in the San Lorenzo River. It includes provisions that would fund the Fall Creek Fish Ladder project, and a large wood project on District and City of Santa Cruz Watershed Property in the Upper Zayante Watershed. Staff anticipates an answer in November 2016.

5.0 Fiscal Planning

5.4 Obtain the Comprehensive Annual Financial Report (CAFR) Award

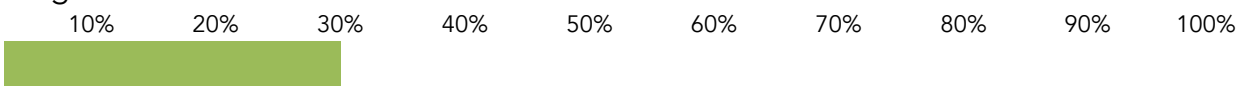
A Comprehensive Annual Financial Report is a set of financial statements comprising the financial report of the District that complies with the accounting requirements promulgated by the Governmental Accounting Standards Board (GASB). The CAFR may be considered a more thorough review of the District yearly budget. The Government Finance Officers Association (GFAO) provides a CAFR Award which is the highest form of recognition in the area of governmental accounting and financial reporting. The District's CAFR is evaluated and judged by an impartial panel of the GFOA to meet the high standards of the program including demonstrating a constructive "spirit of full disclosure" to clearly communicate its financial story to its users. Within the next five years the District will earn the CAFR Award.

SCHEDULED START YEAR: 2017 EST. COMPLETION YEAR: 2017

START DATE: 2016 COMPLETION DATE:

Schedule:

Progress:



STATUS:

Fall 2016 – District has begun incorporating necessary changes to audit and budget process & documents for near-future CAFR.

5.0 Fiscal Planning

5.5 Annual Review of the Reserve Fund Policy

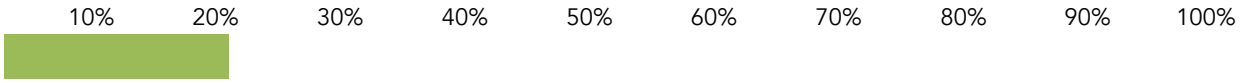
Adequate reserves for the District operations ensure that customers experience both stable rates for service and the security that the District can respond to emergencies, especially regarding water and wastewater quality issues. Adequate reserves ensure that the District will at all times have sufficient funding available to meet its operating, capital and debt service cost obligations, together with future debt or capital obligations, as well as any unfunded mandates, including costly regulatory requirements. The Reserve Fund Policy should be developed to clearly identify specific designated reserve funds, to clearly identify both reserve fund categories and purposes, and set target levels for reserves that are consistent with the District's mission statement, the uniqueness of the District, and the philosophy of the District's Board.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:

Progress:



STATUS:

2016 – District reviewed and updated its Reserve Fund Policy.

5.0 Fiscal Planning

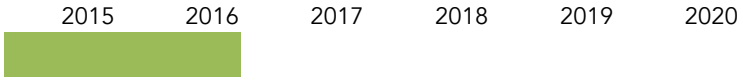
5.6 Fiscal Transparency

Fiscal transparency is a bulwark ensuring appropriate governing and managing of a public agency. Rate payers have a right to review the financial transactions of the District. Within the next five years the District will adopt a Policy detailing the steps and actions the District will undertake to ensure fiscal transparency is available to the rate payers.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2016 COMPLETION DATE:

Schedule:



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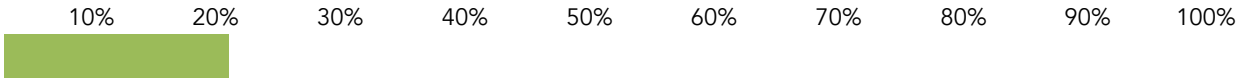


STATUS: Not started yet.

6.0 Public Affairs

Objective:

To show solid planning, long-range outlook and overall value to our customers. We will do this by being completely transparent and open in our business and decisions. We will identify and employ effective ways to receive input, educate and inform the public and proactively engage with a variety of local media outlets.

Summary of 5-Year Strategic Goals:

6.1 Survey Stakeholder Expectations and Understanding of District Issues
6.2 Increase Civic Understanding and Engagement
6.3 Technology Plan
6.4 SDLF Certificate of Transparency

6.0 Public Affairs

6.1 Survey Stakeholder Expectations and Understanding of District Issues

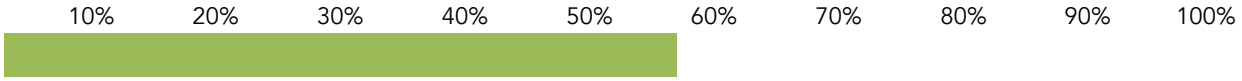
It is important to gauge stakeholder perceptions of the District on a regular basis, to determine how and if perceptions are changing, to improve our service and/or communications and to identify areas where our message is not getting through clearly. Every five years the District will conduct a customer survey such as it did in 2010 to determine what areas of information our customers were interested in and how they would like to receive the information and ask how we might be able to best serve them.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: 2020

START DATE: 2015 COMPLETION DATE:

Schedule:

Progress:



STATUS:

2015 – District conducted on-line/mail-in poll.

6.0 Public Affairs

6.2 Increase Civic Understanding and Engagement

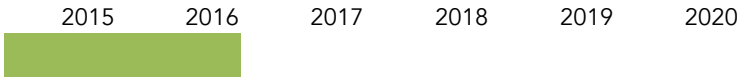
It is critical that the public, especially our ratepayers, understand the issues that public water agencies face on both the global and local scale. Starting a conversation with ratepayers is a good way to engage them in understanding and solving problems. The Public Relations committee is intended to accomplish this. The outcome and advice of this committee will be considered by the Board of Directors for implementation.

Starting in fiscal 2015/16 the District will conduct a 'State-of-the-District' town hall meeting, presenting to the ratepayers in a concise and engaging manor the current issues impacting the District.

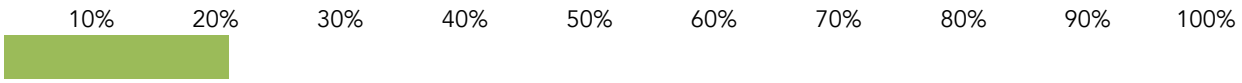
SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:



Progress:



STATUS:

2015 – District conducted a State-of-the-District meeting in October.

6.0 Public Affairs

6.3 Technology Plan

The District will prepare a Technology Plan that will outline procedures and policies the District will use to continue managing and refining its website (including such features as a calendar function, search capability, and providing more documentation and information resources) and its internet presence (such as Facebook, Twitter, etc.) to facilitate transparency, availability of information, open communications channels and providing useful information to District residents. Additionally, the Technology Plan will incorporate a replacement schedule to keep the District's electronic equipment (office computers, SCADA equipment, and radios) up to date.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2017 COMPLETION DATE:

Schedule:

Progress:

STATUS: Not yet started.

6.0 Public Affairs

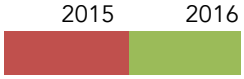
6.4 SDLF Certificate of Transparency

Within the next five years the District will obtain the Special District Leadership Foundation 'Certificate of Transparency' as a way to help ensure the public that the District is functioning in as transparent a manner as possible.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: 2015

START DATE: 2015 COMPLETION DATE: 2016

Schedule:



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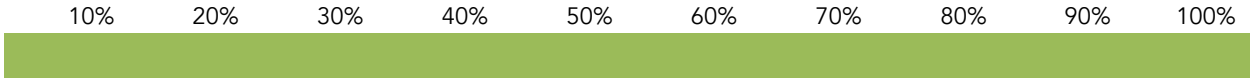


STATUS:
June 16, 2016 – District received the SDLF Certificate of Transparency in June 2016.

7.0 Strategic Partners

Objectives:

To foster beneficial relationships with strategic partners to accomplish the goals of the District. We will do this by embracing strategic ties with other organizations, the legislature and agencies, working closely with regulators and participating in professional associations.

Summary of 5-Year Strategic Goals:

7.1 Develop Strategic Partnerships with Other Agencies
7.2 Through Active Participation, Establish Strong Ties with Regional Planning Groups
7.3 Work with Neighboring Agencies and Impacted Private Well Owners to develop a Groundwater Sustainability Agency (GSA)

7.0 Strategic Partners

7.1 Develop Strategic Partnerships with Other agencies

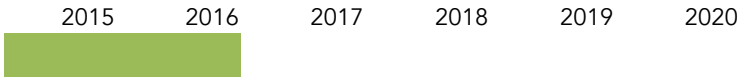
The San Lorenzo River Watershed is a shared resource. Various public agencies oversee how the resource is managed. As such, partnerships and our relations with these other agencies are important. The District will cultivate supportive and positive relationships with other agencies that may impact the District's operations and watershed stewardship efforts.

The Board President and District Manager will meet on a semi-regular basis with representatives from local agencies (including Scotts Valley, City of Santa Cruz, and County of Santa Cruz) to discuss topics of regional concern.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:



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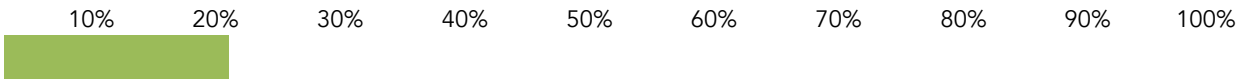


STATUS:

2016 – District has engaged in regional discussion with representatives from local agencies to discuss topics of regional concern. District has jointly applied with the County on two grant applications. District has met with SVWD and City of Santa Cruz to discuss rate setting process.

Staff is actively collaborating with many groups and agencies to strategize and implement projects and plans which enhance environmental health, sustainability and stewardship in the San Lorenzo Valley. Those groups include but are not limited to:

7.0 Strategic Partners

- Santa Margarita Groundwater Sustainability Agency - Multi Agency Stakeholder group which oversees the sustainable management of our shared aquifer.
- Santa Cruz Mountains Stewardship Network – A multi-agency networks working together to enhance stewardship of large landscapes in the Santa Cruz Mountains
- Water Conservation Coalition- Collaboration of all water districts in Santa Cruz County and the County Water Resources, and Non-Profits to reduce water consumption regionally.
- San Lorenzo 2025- Multi-agency effort to enhance fish habitat in the San Lorenzo River.
- Santa Cruz Mountains Bioregional Council- Dedicated to the preservation and enhancement of regional biodiversity over time through education and dissemination of accurate scientific information and assistance in the planning and coordination and implementation of conservation efforts.
- Felton Library Friends – Community group planning the construction of the new Felton Library and the adjacent Nature Connection Play Area.

7.0 Strategic Partners

7.2 Through Active Participation, Establish Strong Ties with Regional Planning Groups

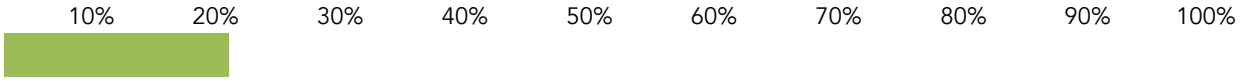
The District shares the water challenges and opportunities with other public agencies in the region and beyond. This makes the need for positive relations with regional planning groups important to the District. We will proactively seek to play an active role in such activities. Within the next five years the District will join and actively participate in various regional organizations or groups that meet on a semi-regular basis to discuss water related issues and topics of concern to the District.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:

Progress:



STATUS:

2016 – District has participated in a number of regional group discussions, including:

- Santa Cruz Integrated Regional Water Management Group
- Santa Margarita Groundwater Advisory Group and Sustainable Groundwater Management Act (SGMA) Joint Powers Agency (JPA) formation sub-group.
- Regional Managers water source project review and collaboration summit.
- Regional Managers internship program collaboration summit.

7.0 Strategic Partners

7.3 Work with Neighboring Agencies and Impacted Private Well Owners to develop a Groundwater Sustainability Agency (GSA)

The District shares responsibility for managing the Santa Margarita Groundwater Basin with the County of Santa Cruz, the Scotts Valley Water District and private well owners within the Santa Margarita Groundwater Basin (SMGB). Since the State adoption of the Sustainable Groundwater Management Act (SGMA), the District has started work with our neighbors on developing a Groundwater Sustainability Agency (GSA).

The Sate defines a GSA as, "One or more local agencies that implement the provisions of SGMA."

The first step in developing a GSA occurred when the District partnered with the County and Scotts Valley Water District to submit a request to the State of California to redefine the boundaries of the SMGB. Prior to our request the State did not recognize SMGB as a medium or high priority basin due to what we believe are clerical errors in the State's defined boundary for the SMGB.

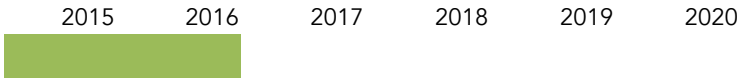
Further accelerated coordination between the District and our partners will be required if the State accepts our request to redefine the SMGB boundaries and adopts the SMGB as a medium priority basin. The formation of a GSA for State identified medium-priority basins is required by June 30, 2017, or two years from basin boundary adjustment, whichever comes later.

Within the next year and a half the District would like to finalize the formation of a GSA with our neighboring agencies and private well owners within the Santa Margarita Groundwater Basin.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

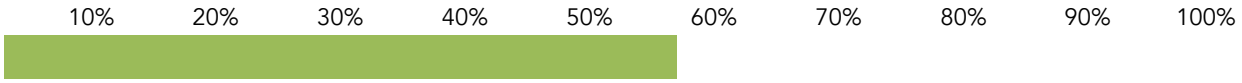
START DATE: 2015 COMPLETION DATE:

Schedule:



7.0 Strategic Partners

Progress:



STATUS:

2015 – District has begun working with Scotts Valley Water District and County of Santa Cruz in drafting the formation documents for future GSA Joint Powers Agency (JPA) for compliance with SGMA and management of our shared groundwater basin.

8.0 Organizational Health/ Personnel

Objectives:

To employ and retain a high quality, motivated workforce. We will do this by utilizing sound policies and personnel practices, offering competitive compensation and benefits, providing opportunities for training, development and professional growth, while ensuring a safe and secure workplace.

Summary of Strategic Goals:

8.1 Staffing Plan
8.2 Compensation and Benefits Benchmarking
8.3 FLSA Audit

8.0 Organizational Health/ Personnel

8.1 Staffing Plan

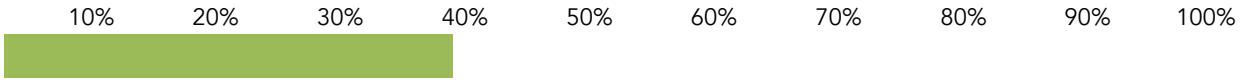
As the District grows and considers taking on a larger role in water stewardship within the Valley, staffing will need to be thoroughly considered and factored into the budgeting process. Management will assess the staffing needs of the District annually during the budget development process and as the need presents itself.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:

Progress:



STATUS:

2016 – Proposed staffing plan has been completed.

8.0 Organizational Health/ Personnel

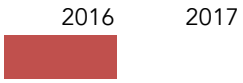
8.2 Compensation and Benefits Benchmarking

Proper consideration for the total compensation for District employees is an important aspect of being effective and efficient with the public funds. The District will perform a comprehensive salary and benefits study to assure a proper baseline of compensation for District employees. It is anticipated that this study will be conducted by a qualified consulting firm.

SCHEDULED START YEAR: 2016 EST. COMPLETION YEAR: 2017

START DATE: 2015 COMPLETION DATE:

Schedule:



Progress:

STATUS: Not yet started.

8.0 Organizational Health/ Personnel

8.3 FLSA Audit

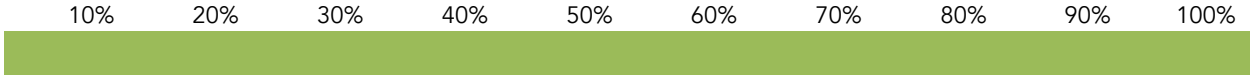
Every five years the District will conduct a Fair Labor Standards Act Audit to ensure that the District is remaining compliant with FLSA rules and regulations.

SCHEDULED START YEAR: 2016 EST. COMPLETION YEAR: 2016

START DATE: 2015 COMPLETION DATE: 2016

Schedule:

Progress:



STATUS:

2016 – Staff, working in conjunction with Paychex (our payroll and HR consultant), conducted an internal FLSA Audit. Determination was that only one position (Board Secretary) was incorrectly assigned per FLSA rules and regulations.

9.0 Administrative Management

Objectives:

Our objective is to create, maintain and implement policies and procedures to ensure sound and efficient management of the District. We will conduct periodic review, refine and implement policies and procedures to ensure that the District Manager and Board have the tools necessary for successfully carrying out the Mission of the District.

Summary of Strategic Goals:

9.1 Update Ordinance 8
9.2 Board Development
9.3 Review Strategic Plan on an Annual Schedule

9.0 Administrative Management

9.1 Update Ordinance 8

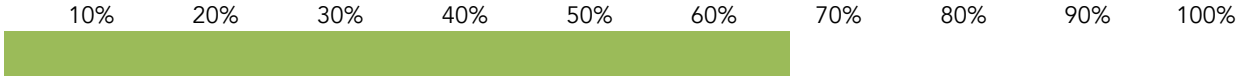
Ordinance 8 is the primary source of the District's rules and regulations. Ordinance 8, originally adopted in 1970, has been amended and augmented on numerous occasions by various ordinances and resolutions since the date of adoption. The District will update Ordinance 8, either through a comprehensive review, rewrite and codification or by 'starting fresh', in order to ensure consistency and clear communication between District Board and staff and our customers. Due to the scope and breadth of this project, the District may engage an outside firm to assist with this effort.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: 2018

START DATE: 2015 COMPLETION DATE:

Schedule:

Progress:



STATUS:

2016 – Ord 8 was repealed and replaced with four new documents; Rules and Regulations, Policies and Procedures, Standard Rates and Charges and Definitions. District has begun the process of review and updating individual components of these four documents.

9.0 Administrative Management

9.2 Board Development

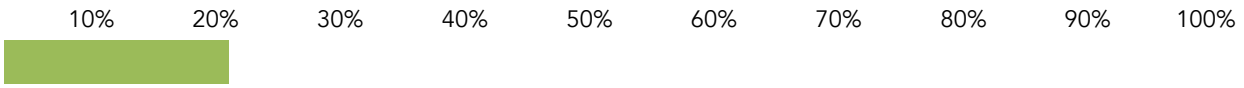
It is a best practice of Boards to address their own development and to adopt best practices in their public role. As such, the Board will adopt clear training and orientation methods each year and plan an annualized calendar for Board development and for individual Board members. The Board will also consider and improve its Board Policies and Procedures Manual.

SCHEDULED START YEAR: 2015 EST. COMPLETION YEAR: annually

START DATE: 2015 COMPLETION DATE:

Schedule:

Progress:



STATUS:

2016 – Board members have attended local and regional water issues and professional development events such as those presented by ACWA. Board rescinded Ord 8, replacing it with four documents; Policies & Procedures, Rules & Regulations, Standard Rates & Charges and Definitions. Board updated the Board Policy Manual.

9.0 Administrative Management

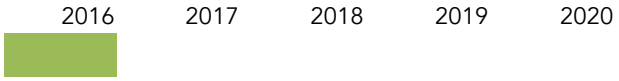
9.3 Review Strategic Plan on an Annual Schedule.

To properly demonstrate commitment of the District in meeting its mission and vision, we will update this strategic plan annually, usually in February of each year.

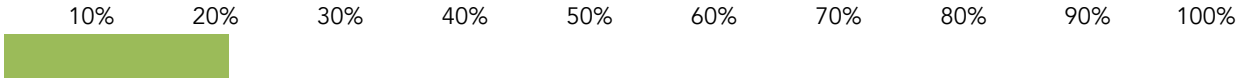
SCHEDULED START YEAR: 2016 EST. COMPLETION YEAR: 2020

START DATE: 2016 COMPLETION DATE:

Schedule:



Progress:



STATUS:

2016 – Strategic Plan was reviewed and a final 2016 document was approved at the December 1, 2016 Regular Board Meeting.

San Lorenzo Valley Water District

Element	Start Year	Completion Year
1.0 Water Supply Management		
1.1 North/South Intertie	2015	2018
1.2 Redundant Quail Hollow Well	2017	2020
1.3 Loch Lomond Water	2016	2020
1.4 Water Audit and Loss Control Program	2015	2020
1.5 Felton Infrastructure and Source Water	2016	2020
2.0 Watershed Stewardship		
2.1 Watershed Management Plan	2015	2020
2.2 Environmental Review of Impacts to San Lorenzo River Watershed	2015	annually
2.3 Climate Action Plan	2015	annually
2.4 Education Program	2015	annually
3.0 Capital Facilities		
3.1 Capital Improvement Program	2015	annually
4.0 Wastewater Management		
4.1 Bear Creek Wastewater Change of Ownership	2016	2020
5.0 Fiscal Planning		
5.1 Fiscal Plan for support of Strategy	2015	annually
5.2 Funding Infrastructure Replacement	2015	annually
5.3 Provide Support for Applying for and Securing Grants	2015	annually
5.4 Obtain the Comprehensive Annual Financial Report (CAFR) Award	2017	2017
5.5 Annual Review of Reserve Fund Policy	2015	Annually
5.6 Fiscal Transparency	2016	On-going
6.0 Public Affairs		
6.1 Survey Stakeholders Expectations and Understanding of District Issues	2015 / 2020	2015/ 2020
6.2 Increase Civic Understanding and Engagement	2015	annually
6.3 Technology Plan	2015	annually
6.4 SDLF Certificate of Transparency	2015	2015
7.0 Strategic Partners		
7.1 Develop Strategic Partnerships with Other Agencies	2015	annually
7.2 Through Active Participation, Establish Strong Ties with Regional Planning Groups	2015	Annually
7.3 Work with Neighboring Agencies and Impacted Private Well Owners to develop a Groundwater Sustainability Agency (GSA)	2015	2017
8.0 Organizational Health/Personnel		
8.1 Staffing Plan	2015	annually
8.2 Compensation and Benefits Benchmarking	2016	2017
8.3 FLSA Audit	2016	2016
9.0 Administrative Management		
9.1 Update Ordinance 8	2015	2018

9.2 Board Development	2015	annually
9.3 Review Strategic Plan on a Regular Schedule	2015	annually

MEMO

TO: Board of Directors

FROM: District Manager

SUBJECT: STRATEGIC PLAN

DATE: April 15, 2011

RECOMMENDATION:

It is recommended that the Board of Directors review this memo and approve the attached resolution which authorizes the waiver of formal bidding procedures for the procurement of professional services relative to a strategic plan.

BACKGROUND:

On January 27, 2011 your Board reviewed a video presentation and discussed the development and implementation of a strategic plan for the District. The purpose of a strategic plan is to establish and set written future direction for the District (i.e. five (5) year roadmap). At the conclusion of the January 27, 2011 meeting your Board directed staff to facilitate a presentation from Brent Ives, BHI Management Consulting regarding strategic plans.

On February 27, 2011 Mr. Ives delivered a presentation to your Board regarding the development of a strategic plan for the District. Following discussion and consideration, your Board directed staff to request a proposal for professional services from BHI Management for the preparation of a comprehensive District Strategic Plan. The District has received the attached proposal in the sum of $22,095.00 for development and preparation of a District Strategic Plan. See Attachment 1. The proposal identifies and outlines the work elements and specific tasks related to the project.

It is recommended that the Board of Directors review this memo and approve the attached resolution which authorizes the waiver of formal bidding procedures for the procurement of professional services relative to a strategic plan.

James A. Mueller
District Manager

JAM/bsb

SAN LORENZO VALLEY WATER DISTRICT

RESOLUTION NO. (10-11)

SUBJECT: AUTHORIZATION TO PROCURE PROFESSIONAL SERVICES FOR PREPARATION OF A DISTRICT STRATEGIC PLAN; WAIVER OF FORMAL BIDDING PROCEDURES

WHEREAS, the District desires to develop and prepare a District Strategic Plan; and

WHEREAS, the District desires to procure professional services for the development and preparation of said plan; and

WHEREAS, the District has received a proposal from BHI Management Consulting, Tracy, California for the development and preparation of a District Strategic Plan and

WHEREAS, District Ordinance 8, Article 18 provides for purchases to be on a competitive basis; and

WHEREAS, District Ordinance 8, Article 18.10 provides for the waiver of competitive procurement procedures relative to professional and specialized services; and

WHEREAS, District Ordinance 8, Article 18.8 provides that the Board of Directors by four-fifths vote may waive as to an individual purchase competitive bidding requirements;

NOW, THEREFORE BE IT RESOLVED by the Board of Directors of the San Lorenzo Valley Water District that the District Manager is hereby authorized and directed to enter into an agreement with BHI Management Consulting for the development and preparation of a District Strategic Plan.

PASSED AND ADOPTED by the Board of Directors of San Lorenzo Valley Water District, County of Santa Cruz, State of California, on the 21st day of April, 2011 by the following vote of the members thereof:

AYES:
NOES:
ABSTAIN:
ABSENT:

B. Barchi
District Secretary

-- Proposal --
Professional Services for a
Strategic Plan
for the
San Lorenzo Valley Water District
Boulder Creek, CA
April 2011

BHI Management Consulting
2459 Neptune Ct., Suite 110
Tracy, Ca.
(209) 740-6779
brent@bhiconsulting.com

Overview of Amendment and Scope of Project:
The objective of this proposal is to outline professional services to the San Lorenzo Valley Water District (District) for assistance in the preparation of a comprehensive District Strategic Plan (Plan). Brent Ives (Consultant), Principal of BHI Management Consulting, will be the primary consultant on this project. BHI will also propose limited use of associate consultants and editorial assistance for the effort in order to reduce costs. Details are outlined in the Task/Cost/Expense table below.
BHI has successfully completed dozens of strategic plans for public agencies in California and is currently involved with three other District plans in the State at various stages of completion.

Strategic Planning Overview:
Strategic Planning utilizing the action-oriented model proposed herein offers a number of benefits for a public District. The term "action-oriented" means that the big picture direction from the Board, in terms of Mission and Vision, are clearly laid out in the Plan with actions and initiatives that support the Board's direction. This is a clear and important role of the elected Board. Our planning model involves members of the elected Board of Directors to deliberately engage by providing critical direction and guidance in the form of Board generated Mission, Vision and Values. Training for all roles of public District work is incorporated within each meeting and session. This planning approach carefully involves the Board in setting clear and thoughtful big-picture direction for the District as expressed in the strategic plan.

Also crucial to any practical planning effort is a clearly delineated workplan in the form of projects, initiatives and actions that result from the document. In this case, a specific workplan will be forthcoming as part of the published Plan. The workplan is derived

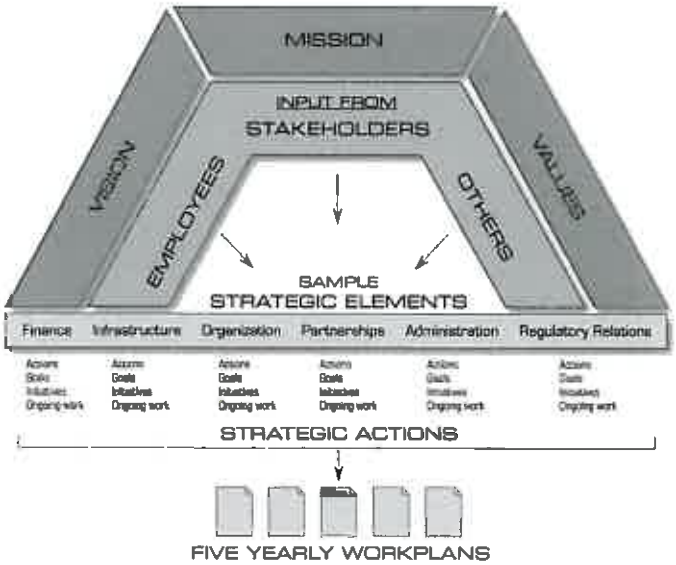
from and seeks to meet the overall direction of the Board with the application of the professional perspective of the Staff. Thus, our approach also allows for professional staff to do what they do best, organize and implement positive and productive work programs that make reality from the Vision of the Board. In this way the staff is allowed to show how they can meet the Vision and intentions of the Board by applying their professional judgment and expertise to the direction of the District.

Top-to-Bottom planning creates important clarity for all involved by articulating the District's future then laying out a clear roadmap for achieving that future. Any reader of the resultant Plan can see a succinct plan for where the District is going, why it's important, what the strategy is and how it intends to get there, and how it will be prioritized and measured. The Plan becomes the "*way we plan here*", for agencies that fully implement its annual maintenance and integrate it into the daily District administration of the District. This type of Plan is usually about 20-30 pages long and contains an integrated overview table that shows the plan for each operational element of the District, what will be done and when. This serves as the Executive Overview Strategy Table. Since the Plan articulates a clear view into the future, it eliminates many of the issues facing public agencies today. Included in the planning process and Plan itself are clear performance metrics, as benchmarks, and a plan for maintaining a realistic and useful Plan for the District.

Specific Task Detail and Options:

The work outlined herein is generally divided into 3 basic stages, with sub-parts:

1. Information Gathering
2. Board Strategic Planning Workshop
3. Document Development



Stage 1- Information Gathering –
1a. Consultant will conduct initial meetings with General Manager and staff to discuss background, develop specific approach to the various planning events and tasks, and discuss key coverage areas for inclusion in the Plan.

1b. Conduct meetings with District employees to gather their thoughts and perspectives regarding future District-wide vision, initiatives and strategy, while allowing their integration into the planning process. This allows the employees the opportunity to feed the Board with their future perspective for consideration in the Plan.

1c. Consultant will conduct meetings with the public to gather valuable perspectives on the future for the Board to consider (2 meetings). These meetings allow the public the opportunity to provide input in the various areas of the Plan including Mission, Vision, Values and important future considerations for the Board to consider.

1d. Consultant and District senior staff will meet with nearby partner agencies to allow for them to discuss the future in the context of this effort and provide any perspective they may have for the Board to consider.

Stage 2 - Board of Directors Workshop and preparation –
2a. Consultant will interview each Board member to gather their thoughts and perspectives regarding the status and future of the District and collect their individual visions for the future. This allows for the Board members and Consultant to meet one another, share thoughts regarding planning and for the consultant to hear important background information. The interviews also allow for the best utilization of time at the workshop by properly focusing the discussions.

2b. Consultant will facilitate the Strategic Planning workshop (estimated 6-8 hours, if desired 2 meetings could be scheduled to accommodate the Board) with the Board including the following elements.

- Re-visit, refine, clarify any current, or write new Mission Statement, develop a Vision Statement and Core Values of the District Board.
- Overview clear roles and why the Board plays a major and crucial role in visioning the future for the District.
- Organize the future by determining the key strategic elements of District operations and management under which the workplan will be organized (see Sample Strategic Elements in graphic above). The Board will then craft an objective and strategy statement for each strategic element. This statement provides clear and specific direction to staff as they assemble a five-year workplan that meets the Board's Vision. The assembled group will also briefly

consider an overview of initial workplan strategies for each of the "strategic elements" to begin setting the five-year workplan.

Stage 3 - Strategic Plan Document Development –
3a. The Consultant will work with senior staff to produce progressive stages of the plan through to final draft phase. The Consultant will assist staff in this writing assignment, guiding construction, consistency and intentions of each section and piece of strategy. The Consultant will begin by preparing a draft from which he and staff will work. The final Plan will include prioritized actions and projects that will support the Board's Vision as well as means for measuring progress of the Plan. This is anticipated to comprise 3-4 meetings (both face-to-face and on-line video meetings) of this group (Document Delivery Team), generally on a bi-monthly frequency. It is understood that SLVWD staff has much written material already completed which may be easily modified for this purpose. The resultant estimate of hours is reduced in this area. On-line video review meetings of the progressive stages of the document will also be utilized for cost reduction purposes.

3b. Consultant will make a briefing presentation of the initial draft to the Board for "tone-check" to assure that the Plan is headed in the direction expected by the Board.

3c. Consultant will provide a briefing presentation of the final draft for Staff to present to the Board.

3d. Consultant will print and provide 25 bound copies of final Plan to the District along with electronic version on CD in Microsoft Word and .PDF formats.

Note: (BHI Management Consulting may use associate consultants to assist during planning sessions and steering committee work. Brent Ives, Principal of BHI will be the primary consultant for the project and attend most meetings and all workshops.)

Preliminary Schedule (dates approximate):

Engagement begins approximately two – four weeks from receipt of this signed agreement. The work outlined in the table below is also divided into 3 stages:

1. Information Gathering
2. Board Strategic Planning Workshop
3. Document Development

The estimated schedule of these three phases is broken down below. Schedule depends heavily on ability to schedule meeting times and the availability of Board and Staff at the times proposed.

Task Set Schedule:

1. Initial meetings with Sr. Staff and input stage	(Week 2-6)
2. Board interviews	(Week 5-7)
2. Conduct strategic planning workshop (Board/Sr. Staff)	(Week 8-10)
3. Meet with Document Delivery Team to draft the plan	(Weeks 11-16)
3. "Tone-check" meeting with the Board	(Week 16-17)
3. Presentation delivered to staff of final plan to Board for approval	(Week 18-20
3. Publish Plan	(Week 22-24)

Terms and Conditions:

BHI Management Consulting shall perform above services as agreed under authorized signature amendment of the District. Consultant shall not begin work until receipt of signed agreement. Billing shall be monthly. The estimated costs per stage below are an estimated spread of hourly costs across the BHI organization. The cost for the three stages will generally be broken down as follows:

1.	Information Gathering	35%
2.	Workshop	25%
3.	Plan Development	40%

Effort will be spread not to exceed the agreed amendment amount. Signature lines are provided below.

Costs and Rates:

The total estimated cost of the effort to support the work scope described is estimated at $20,695.00 as outlined in Table 1 below. Expenses are estimated and listed separately in the table. Options are listed below the table and priced by fixed price listed.

Table 1 – Task Cost Breakdown

Additional tasks, not covered specifically by this amendment may be added by contract addendum. The undersigned parties agree to the terms and conditions of the workscope as described in this amendment.

SAN LORENZO VALLEY WATER DISTRICT Estimated Effort Costs	Principal (ives) @$250/hr.	Sr. Consultant @$110/hr.	Editor @$65/hr.	LaborHours/task Total	Task Cost	Comment
Task Set	Hours	Hours	Hours	Hours		
1a. Initial Meetings	4	0	0	4	$ 1,000.00	Visit number 1
1.b. Employee meetings	6	0	0	6	$ 1,500.00	Accomplished on visit number 2
1.c. Public Meetings	6	0	0	6	$ 1,500.00	Accomplished on visit number 2
1.d Partner agency meetings	3	0	0	3	$ 750.00	Accomplished on visit number 2
2a.. Board input interviews	6	0	0	6	$ 1,500.00	Accomplished on visit number 3
2b. Board Workshop	12	9	0	21	$ 3,990.00	Visit number 4
3a. Document Development	26	0	6	32	$ 6,890.00	Assumes 3-4 meetings to meet with Staff for the Principal at least two being face-to-face
3b. Board "Tone Check" meeting	7	0	0	7	$ 1,750.00	
3c. Final Board approval briefing	4	0	1	5	$ 1,065.00	
3d. Publish approved Plan	3	0	0	3	$ 750.00	
TOTAL PLAN	77	9	7	93	$ 20,695.00	

Estimated Expenses

	Time or Expense	Cost per	Cost		Cost Total	
Travel expenses	Travel expense for in-District visits	6 visits	1100		$ 1,100.00	Trips estimated herein at times include both Principal and associate. Thus can vary.
Reproduction	-	-	200		$ 200.00	
Office Supplies and telephone costs	-	-	100		$ 100.00	
TOTAL ESTIMATED EXPENSES	0	0	1400	0	$ 1,400.00	

Authorization:

Mr. Jim Mueller, District Manager Date Brent H. Ives, Principal Date

San Lorenzo Valley Water District
Boulder Creek, CA

BHI Management Consulting
Tracy

About the Firm and Primary Consultants:
BHI Management Consulting brings unique qualifications to this project by a dual perspective approach to the process of optimizing Board relations and Strategic Planning. The firm is owned and operated by Brent Ives and is located in Tracy, CA. It was begun in 1996 and has focused on providing for the organizational health issues of Special Districts since 1999. The firm carries Brent as the Principal and four associates, Mr. Jim Raymond, Sr. Consultant, Dr. Nick Pinhey, Sr. Consultant, Mr. Andrew Ives, Associate Consultant and Ms. Lynda Ives, Editor/Facilitating assistant. Other associates are contracted as projects demand relative to the engagement and/or District specific needs. While Mr. Brent Ives will be the primary project manager, others may act as facilitating assistant for the workshop without additional cost. BHI is currently working on 5 Strategic Plans and updates across the state with different agencies, as well as two other similar projects for District board needing to enhance their means of evaluating their General Manager's performance.

Mr. Brent Ives has worked with numerous special Districts and cities across the state dealing with organizational issues, primarily in optimizing operational approach for each District as needed. BHI is currently engaged with four similar projects with California special Districts on strategic planning and teambuilding. Brent also serves as a faculty member on the Special Districts Governance Academy for Special District Board members, teaching classes in the "Foundations of Governance", "Teambuilding", "Setting Direction and Community Leadership" and "The Board's Role in Human Resources". Brent has taught representative board members and staff from well over 100 Districts across the state and Oregon. He is the Chapter Ambassador for the CSDA and teaches his own curriculum on Strategic Planning for Association sponsored classes across California. He is educated in Organizational Behavior at the University of San Francisco, has 25 years experience as a technical manager for the Lawrence Livermore National Laboratory and 14 years as a City Council Member in the City of Tracy, California. He is currently the directly elected Mayor of Tracy, a member of the Altamont Commuter Express (commute rail service) Commission, a member of the South County Fire Protection Authority in San Joaquin County, and is member of the Board of the San Joaquin Council of Governments.

Brent and the BHI team bring unique perspective to the organizational processes that differentiate them from other firms. As an experienced elected official, Brent knows how boards must function to best fulfill their public trust. He is an experienced manager who has led groups of engineers and technicians on complex multi-million dollar projects for the Department of Energy at the Lawrence Livermore National Laboratory and can understand the needs of staffs for clarity. His education in Organizations allows him to apply that experience to your situation for your needs.

This broad experience in organizational effectiveness is captured by the District when they commission BHI along with Brent's valuable experience and expertise. Brent is known for establishing a sincere and knowledgeable relationship with both the Board

members and staff. Brent's time and experience as an elected official allow him unique perspective that helps him to "see" it from their points of view which assists in capturing the Board's perspective in moving forward. Brent will lead the District through a solid, proven strategic planning process and develop a solid and enduring process for GM evaluation that will be realistic, honest, fair, broad and integrated.

SIMILAR ENGAGEMENTS AND REFERENCE CONTACTS (partial list):

Jurupa Community Services District (Water and Sanitary Sewer services), (Mr. Eldon Horst, General Manager, ehorst@jcsd.us, (951-727-3527). Project included the development of a comprehensive **five-year Strategic Plan** for the District. The Plan includes sections for both water and sanitary sewer services, along with Park and Recreation and Street Lighting. All public, employee and partner agencies had provided their input to the Plan through workshops.

California Special District's Association, (Mr. Neil McCormick), Executive Director, 916-442-7887, neilm@csda.net. Facilitated the associations 19 member Board and assisted staff in the development of their 2009/10 Strategic Plan.

Palmdale Water District (Mr. Raul Figueroa, Board President, Mr. Dennis LaMoreaux, General Manager, (661-947-4111). Performed numerous organizational services including a full five-year **Strategic Plan**, employee survey, organizational review, supervisory training, and employee performance appraisal rework.

Mt. View Sanitary District (Mr. Mike Roe, General Manager, (925-228-5635, x-32) Performed organizational analysis, reworked job descriptions, created a comprehensive five-year **Strategic Plan** for the District.

Conejo Recreation and Park District (Mr. Jim Friedl, General Manager, 805-381-1239), Led Board and staff through comprehensive **five-year strategic planning process**. Plan was done on time and within the original budget. Manager states he uses the plan every day, in developing an agenda and with every Board meeting agenda.

Tuolumne Utilities District, (Water and Sanitary Services) (Mr. Pete Kampa, General Manager, (pkampa@tuolumneutilities.com), 209-536-6485 – Project included the development a comprehensive five-year **Strategic Plan** for the District. The nature of the Tuolumne Utilities area in light of this effort created significant visibility with public and partner agencies. The Plan includes sections for both water and sanitary services. All public, employee and partner agencies have provided their input to the Plan through meetings.

Orange County Sanitation District (Mr. Bob Ghirelli, Assistant General Manager, (rghirelli@OCSD.com), 714-593-7400 - BHI was engaged to assist them with a **Strategic**

Plan for this prestigious organization (2.5 million served with sanitation services, nearly all of Orange County, California). Brent has worked with the Board of Directors in a series of 4 workshops consisting of 25 members from various member agencies (Mayors, Council Members and County Supervisors), along with leading the Executive Management Team of the District to complete its multi-year Strategic Plan. Brent is the Principal consultant for this project. The Plan is now in its second year revision process.

Dublin San Ramon Services District, (Water and Sanitary Services) (Mr. Bert Michalczyk, General Manager, (michalczyk@dsrsd.com), 925-828-0515 – Developed a five-year **Strategic Plan** for the District. The District provides water and sanitary sewer services for 120,000 in the Dublin-San Ramon Valley in Northern California. Brent is the Principal consultant for this project.

Las Gallinas Valley Sanitary District, Mr. Mark Williams, General Manager, (mwilliams@lgvsd.org), 415-472-1734, - Worked with Board and staff to develop a five-year **Strategic Plan** for this District.

SPECIAL
BOARD OF DIRECTORS
SAN LORENZO VALLEY WATER DISTRICT
MINUTES
January 23, 2019

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.

Wednesday, January 23, 2019 at 5:30 p.m., Highlands Park Senior Center, 8500 Hwy. 9, Ben Lomond, CA 95005.

MINUTES

1. Convene Meeting 5:37 p.m.
   Roll Call: Dir. Fultz and Pres. Henry – no quorum, continued as a Community Meeting

BROWN ACT & ETHICS TRAINING

Presentation by D. Timoney, SDRMA Chief Risk Officer.

BROWN ACT

Presented by

Dennis Timoney, ARM
SDRMA Chief Risk Officer

Currently there are 508 members participating in the Property/Liability Program and 442 members participating in the Workers Compensation Program.

Dennis supervises the Claims Management and Loss Prevention Programs for SDRMA.

BROWN ACT

This is the minimum standard, any Board can agree to more.

Two key parts of the Brown Act have not changed since its adoption in 1953. One is the Brown Act's initial section, declaring the Legislature's intent:

"In enacting this chapter, the Legislature finds and declares that the public commissions, boards and councils and the other public agencies in this State exist to aid in the conduct of the people's business.
It is the intent of the law that their actions be taken openly and that their deliberations be conducted openly." Transparency.
"The people of this State do not yield their sovereignty to the agencies which serve them. The people, in delegating authority, do not give their public servants the right to decide what is good for the people to know and what is not good for them to know.
The people insist on remaining informed so that they may retain control over the instruments they have created."

The regularly scheduled meeting is the Board's job.

BROWN ACT

Broad coverage

The Brown Act covers members of virtually every type of local government body, elected or appointed, decision-making or advisory.

Some types of private organizations are covered, as are newly-elected members of a legislative body, even before they take office.

Similarly, meetings subject to the Brown Act are not limited to face-to-face gatherings. They also include any communication medium or device through which a majority of a legislative body discusses, deliberates or takes action on an item of business outside of a noticed meeting.

They include meetings held from remote locations by teleconference.

Communication must be in the open.

Public Records Act requests extends to emails + texts.

BROWN ACT

Public participation in meetings

In addition to requiring the public's business to be conducted in open, noticed meetings, the Brown Act also extends to the public the right to participate in meetings. Individuals, lobbyists, and members of the news media possess the right to attend, record, broadcast, and participate in public meetings. Minutes must be action minutes at the minimum.

The public's participation is further enhanced by the Brown Act's requirement that a meaningful agenda be posted in advance of meetings, by limiting discussion and action to matters listed on the agenda, and by requiring that meeting materials be made available.

Beginning in 2020 the website, agendas & minutes must be ADA compliant.

BROWN ACT

Legislative bodies may, however, adopt reasonable regulations on public testimony and the conduct of public meetings, including measures to address disruptive conduct and irrelevant speech.

Brown Act Minimum

20 minutes total Oral Communication
3 minutes per speaker
Cannot yield speaking time to another
speak once per item

BROWN ACT

What is a "legislative body" of a local agency?

A "legislative body" includes:

The Governing Body of a local agency or other local body created by state or federal statute. This includes city councils, boards of supervisors, school boards and boards of trustees of special districts. A "local agency" is any city, county, city and county, school district, municipal corporation, successor agency to a redevelopment agency, district, political subdivision or other local public agency.

Entities created pursuant to joint powers agreements are also local agencies within the meaning of
the Brown Act.

BROWN ACT

Newly-elected members of a legislative body who have not yet assumed office must conform to the requirements of the Brown Act as if already in office. Thus, meetings between incumbents and newly-elected members of a legislative body, such as a meeting between two outgoing members and a member-elect of a five-member body, could violate the Brown Act.

A new member becomes a member as soon as the election is certified by the elections department.

A new member cannot vote or speak until sworn in.

BROWN ACT

Standing committees of a legislative body, irrespective of their composition, which have either: (1) a continuing subject matter jurisdiction; or (2) a meeting schedule fixed by charter, ordinance, resolution, or formal action of a legislative body. Even if it comprises less than a quorum of the governing body, a standing committee is subject to the Brown Act.

For example, if a governing body creates long-term committees on budget and finance or on public safety, those are standing committees subject to the Brown Act.

Standing committees must have a fixed time, place + location. These committees are for recommendations only and have no legislative standing.

BROWN ACT

A temporary advisory committee composed **solely of less than a quorum** of the legislative body that serves a limited or single purpose, that is not perpetual, and that will be dissolved once its specific task is completed is not subject to the Brown Act.

Temporary committees are sometimes called *ad hoc* committees, a term not used in the Brown Act. Examples include an advisory committee composed of less than a quorum created to interview candidates for a vacant position or to meet with representatives of other entities to exchange information on a matter of concern to the agency.

Also called an Ad Hoc Committee. It's a temporary advisory committee for limited purpose.

BROWN ACT

Brown Act meetings

Brown Act meetings include a legislative body's regular meetings, special meetings, emergency meetings, and adjourned meetings.

- Regular Meetings" are meetings occurring at the dates, times, and location set by resolution, ordinance, or other formal action by the legislative body and are subject to 72- hour posting requirements.
- "Special Meetings" are meetings called by the presiding officer or majority of the legislative body to discuss only discrete items on the agenda under the Brown Act's notice requirements for special meetings and are subject to 24-hour posting requirements.

BROWN ACT

- "Emergency meetings" are a limited class of meetings held when prompt action is needed due to actual or threatened disruption of public facilities and are held on little notice.
- "Adjourned Meetings" are regular or special meetings that have been adjourned or re-adjourned to a time and place specified in the order of adjournment, with no agenda required for regular meetings adjourned for less than five calendar days as long as no additional business is transacted.

BROWN ACT

The Brown Act creates six exceptions to the meeting definition:

Individual Contacts

The first exception involves individual contacts between a member of the legislative body and any other person. The Brown Act does not limit a legislative body member acting on his or her own. This exception recognizes the right to confer with constituents, advocates, consultants, news reporters, local agency staff, or a colleague.

Board members can travel in pairs.
3 Board members can meet as long as they are not talking about District.

Conferences

The second exception allows a legislative body majority to attend a conference or similar gathering open to the public that addresses issues of general interest to the public or to public agencies of the type represented by the legislative body.

Don't discuss District business.

BROWN ACT

Community Meetings

The third exception allows a legislative body majority to attend an open and publicized meeting held by another organization to address a topic of local community concern. A majority cannot discuss among themselves, other than as part of the scheduled program, business of a specific nature that is within the legislative body's subject matter jurisdiction.

Other Legislative Bodies

The fourth exception allows a majority of a legislative body to attend an open and publicized meeting of: (1) another body of the local agency; and (2) a legislative body of another local agency. Again, the majority cannot discuss among themselves, other than as part of the scheduled meeting, business of a specific nature that is within their subject matter jurisdiction.

BROWN ACT

Standing Committees

The fifth exception authorizes the attendance of a majority at an open and noticed meeting of a standing committee of the legislative body, provided that the legislative body members who are not members of the standing committee attend only as observers (meaning that they cannot speak or otherwise participate in the meeting).

Social or Ceremonial Events

The final exception permits a majority of a legislative body to attend a purely social or ceremonial occasion. Once again, a majority cannot discuss business among themselves of a specific nature that is within the subject matter jurisdiction of the legislative body.

BROWN ACT

Serial meetings

One of the most frequently asked questions about the Brown Act involves serial meetings. At any one time, such meetings involve only a portion of a legislative body, but eventually involve a majority. The Brown Act provides that "[a] majority of the members of a legislative body shall not, outside a meeting … use a series of communications of any kind, directly or through intermediaries, to discuss, deliberate, or take action on any item of business that is within the subject matter jurisdiction of the legislative body.

BROWN ACT

Location of meetings

The Brown Act generally requires all regular and special meetings of a legislative body, including retreats and workshops, to be held within the boundaries of the territory over which the local agency exercises jurisdiction.

An open and publicized meeting of a legislative body may be held outside of agency boundaries if the purpose of the meeting is one of the following:

Comply with state or federal law or a court order, or attend a judicial conference or administrative proceeding in which the local agency is a party;

Inspect real or personal property that cannot be conveniently brought into the local agency's territory, provided the meeting is limited to items relating to that real or personal property;

BROWN ACT

Agendas for regular meetings

Every regular meeting of a legislative body of a local agency — including advisory committees, commissions, or boards, as well as standing committees of legislative bodies — must be preceded by a posted agenda that advises the public of the meeting and the matters to be transacted or discussed.

The agenda must be posted at least 72 hours before the regular meeting in a location "freely accessible to members of the public.

The agenda must state the meeting time and place and must contain "a brief general description of each item of business to be transacted or discussed at the meeting, including items to be discussed in closed session

BROWN ACT

Mailed agenda upon written request

The legislative body, or its designee, must mail a copy of the agenda or, if requested, the entire agenda packet, to any person who has filed a written request for such materials.

Notice requirements for special meetings

The special meeting notice must also be posted at least 24 hours prior to the special meeting using the same methods as posting an agenda for a regular meeting: (1) at a site that is freely accessible to the public, and (2) on the agency's website if: (1) the local agency has a website; and (2) the legislative body whose meeting is the subject of the agenda is either (a) a governing body, or (b) has members that are compensated, with one or more members that are also members of a governing body.

BROWN ACT

Non-agenda items

The Brown Act generally prohibits any action or discussion of items not on the posted agenda.

However, there are three specific situations in which a legislative body can act on an item not on the agenda;

When a majority decides there is an “emergency situation” (as defined for emergency meetings);

When two-thirds of the members present (or all members if less than two-thirds are present) determine there is a need for immediate action and the need to take action “came to the attention of the local agency subsequent to the agenda being posted.”

This

exception requires a degree of urgency. Further, an item cannot be considered under this

provision if the legislative body or the staff knew about the need to take

BROWN ACT

This exception requires a degree of urgency. Further, an item cannot be considered under this provision if the legislative body or the staff knew about the need to take immediate action before the agenda was posted.

A new need does not arise because staff forgot to put an item on the agenda or because an applicant missed a deadline; or

When an item appeared on the agenda of, and was continued from, a meeting held not more than five days earlier.

BROWN ACT

The right to attend and observe meetings

A number of Brown Act provisions protect the public's right to attend, observe, and participate in meetings.

Members of the public cannot be required to register their names, provide other information, complete a questionnaire, or otherwise "fulfill any condition precedent" to attending a meeting.

Any attendance list, questionnaire, or similar document posted at or near the entrance to the meeting room or circulated at a meeting must clearly state that its completion is voluntary and that all persons may attend whether or not they fill it out.

BROWN ACT

No meeting can be held in a facility that prohibits attendance based on race, religion, color, national origin, ethnic group identification, age, sex, sexual orientation, or disability, or that is inaccessible to the disabled. Nor can a meeting be held where the public must make a payment or purchase in order to be present.

This does not mean, however, that the public is entitled to free entry to a conference attended by a majority of the legislative body

BROWN ACT

Records and recordings

The public has the right to review agendas and other writings distributed by any person to a majority of the legislative body in connection with a matter subject to discussion or consideration at a meeting.

Except for privileged documents, those materials are public records and must be made available upon request without delay. A fee or deposit as permitted by the California Public Records Act may be charged for a copy of a public record.

A writing distributed during a meeting must be made public:
At the meeting if prepared by the local agency or a member of its legislative body; or After the meeting if prepared by some other person.

BROWN ACT

The public's place on the agenda

Every agenda for a regular meeting must allow members of the public to speak on any item of interest, so long as the item is within the subject matter jurisdiction of the legislative body.

Further, the public must be allowed to speak on a specific item of business before or during the legislative body's consideration of it.

Moreover, the legislative body cannot prohibit public criticism of policies, procedures, programs, or services of the agency or the acts or omissions of the legislative body itself. But the Brown Act provides no immunity for defamatory statements

Personal meeting notes are not a public document.
The public cannot complain about staff.

BROWN ACT

Closed Sessions

A closed session is a meeting of a legislative body conducted in private without the attendance of the public or press. A legislative body is authorized to meet in closed session only to the extent expressly authorized by the Brown Act.

Agendas and reports

Closed session items must be briefly described on the posted agenda and the description must state the specific statutory exemption. An item that appears on the open meeting portion of the agenda may not be taken into closed session until it has been properly agendized as a closed session item or unless it is properly added as a closed session item by a two-thirds vote of the body after making the appropriate urgency findings

BROWN ACT

Following a closed session, the legislative body must provide an oral or written report on certain actions taken and the vote of every elected member present. The timing and content of the report varies according to the reason for the closed session and the action taken.
The announcements may be made at the site of the closed session, so long as the public is allowed to be present to hear them.

If there is a standing or written request for documentation, any copies of contracts, settlement agreements, or other documents finally approved or adopted in closed session must be provided to the requestor(s) after the closed session

BROWN ACT

The California Attorney General has opined that if the agency's attorney is not a participant, a litigation closed session cannot be held. In any event, local agency officials should always consult the agency's attorney before placing this type of closed session on the agenda in order to be certain that it is being done properly.

Before holding a closed session under the pending litigation exception, the legislative body must publicly state the basis for the closed session by identifying one of the following three types of matters: existing litigation, anticipated exposure to litigation, or anticipated initiation of litigation.

BROWN ACT

Closed Sessions
Real Estate Negotiations;
Labor Negotiations;
Public Employment;
The Brown Act authorizes a closed session "to consider the appointment, employment, evaluation of performance, discipline, or dismissal of a public employee or to hear complaints or charges brought against the employee." The purpose of this exception — commonly referred to as the "personnel exception" — is to avoid undue publicity or embarrassment for an employee or applicant for employment and to allow full and candid discussion by the legislative body; thus, it is restricted to discussing individuals, not general personnel policies.

BROWN ACT

The body must possess the power to appoint, evaluate, or dismiss the employee to hold a closed session under this exception. That authority may be delegated to a subsidiary appointed body.

BROWN ACT

The confidentiality of closed session discussions

The Brown Act explicitly prohibits the unauthorized disclosure of confidential information acquired in a closed session by any person present, and offers various remedies to address breaches of confidentiality. It is incumbent upon all those attending lawful closed sessions to protect the confidentiality of those discussions. One court has held that members of a legislative body cannot be compelled to divulge the content of closed session discussions through the discovery process.

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 the entire body can decide to waive the privilege.

BROWN ACT

Invalidation

Any interested person, including the district attorney, may seek to invalidate certain actions of a legislative body on the ground that they violate the Brown Act.

Before filing a court action seeking invalidation, a person who believes that a violation has occurred must send a written "cure or correct" demand to the legislative body. This demand must clearly describe the challenged action and the nature of the claimed violation. This demand must be sent within 90 days of the alleged violation or 30 days if the action was taken in open session but in violation of Section 54954.2, which requires (subject to specific exceptions) that only properly agendized items are acted on by the governing body during a meeting.

BROWN ACT

The legislative body then has up to 30 days to cure and correct its action. If it does not act, any lawsuit must be filed within the next 15 days. The purpose of this requirement is to offer the body an opportunity to consider whether a violation has occurred and to weigh its options before litigation is filed.

BROWN ACT

Costs and attorney's fees

Someone who successfully invalidates an action taken in violation of the Brown Act or who successfully enforces one of the Brown Act's civil remedies may seek court costs and reasonable attorney's fees. Courts have held that attorney's fees must be awarded to a successful plaintiff unless special circumstances exist that would make a fee award against the public agency unjust

BOARD OF DIRECTORS
SAN LORENZO VALLEY WATER DISTRICT
MINUTES
February 7, 2019

Thursday, February 7, 2019 at 5:30 p.m., SLVWD, 13057 Highway 9, Boulder Creek, CA 95006.

1. Convene Meeting 5:35 PM
   Roll Call: Dir. Swan, Dir. Smallman, Pres. Henry, Dir. Fultz, Dir. Bruce
   Staff: Dist. Mgr. Rogers, Environmental Programs Mgr. Michelsen, Dist. Secretary Hossack

2. Additions and Deletions to Closed Session Agenda: None

3. Oral Communications Regarding Items in Closed Session: None

4. Adjournment to Closed Session 5:37 PM

5. Convene to Open Session at 6:30 p.m.
   Roll Call: Dir. Swan, Pres. Henry, Dir. Smallman, Dir. Fultz, Dir. Bruce
   Staff: Rogers, Michelsen, Hossack, Director of Finance & Business Services Hill, Director of Operations Furtado.

6. Report of Actions Taken in Closed Session: None

7. Additions and Deletions to Open Session Agenda: None

8. Oral Communications:
   Tina To-Boulder Creek addressed the Board to introduce herself as a candidate for the Environmental Committee.

9. Unfinished Business:
   a. SLVWD COMMITTEE MEETINGS
      Pres. Henry introduced this item.
      Dir. Bruce said the Environmental 3rd Tuesday 10:00
      Dir Smallman wants to have meetings on Tuesday but at 4:00 and 5:00. If he can't attend meetings at that time, he'd rather not be on the Committee. That's for both Environmental and Engineering Committee meetings.
      DM Rogers said the meeting cannot be meetings in the Ops Building at 4:00 or 5:00 because that is when Ops crews are ending their day. He suggested that we look into a different location. Staff already has to attend a lot of afterhours meetings.
      Dir. Smallman said he feels that if the Boardroom needs to be treated as a locker room maybe the cartoon of hillbillies applies

Dir. Bruce questioned if there are alternative locations that can be used.
DM Rogers there are other locations and the room size is much smaller for committees. The boardroom is a multi-purpose room. The word hillbilly was uncalled for.
Dir. Smallman apologized for the comment he made. He doesn't want to discuss this anymore. Take him off of the committee.
Dir. Fultz said that people that serve on the Board and Committees have jobs too. Perhaps staff can arrange to attend only one Board meeting per month. Accommodations need to be made for Board Members.
DM Rogers questioned if the committees have to meet monthly.
Dir. Bruce suggested quarterly or bi-monthly meetings. She also like the idea of an alternative location.
Pres. Henry said she doesn't know why committee meetings have to be every month.
Dir. Bruce questioned if that can be left to staff. Special meetings can be called if necessary.
Dir. Swan asked if the scheduling can be left to the members of the committee.
Dir. Bruce thinks where is important to disclosure. Meetings need to be scheduled ahead of time.
Dir. Fultz said he thinks the Environmental Comm could be held quarterly but the Engineering Comm should be held once a month for a while. And we need to be looking at our inventory of our system that we are need to do. He also has opinions about Budget & Admin
DM Rogers said that's worth looking into.
Pres. Henry clarified what she heard is staff will look into another site
DM Rogers the Dist. has used the library before.
Fultz questioned if Rick has keys to every public meeting building in town.
DM Rogers staff will look into alternate meeting locations.
Pres. Henry there won't be a decision on that tonight.
DM Rogers said we'll see what will work for the committees and staff.
Dir. Fultz questioned if the fire hall in Zayante is okay at night.
DM Rogers said that the LADOC decided to meet quarterly at the Ops Bldg. and to have special meetings at the Zayante Fire Station
Pres. Henry said that leaves Budget & Finance and Admin committees.
Dir. Fultz said he thinks the B & F meetings need to be monthly and 9:00 am is his preference.
Pres. Henry would like the B & F meeting to be on Tuesday or Wednesday.
Dir. of Ops Furtado said Wednesday mornings are not good because staff has Safety Meetings every Wednesday.
Dir. of Finance Hill said that the public member said afternoons were better.
Dir. Fultz said 2:00 to 4:00 will not work for him. It has to be in the morning or at night. He has been advocating for moving the Board meetings to the Felton Library when it's ready. Do we want to make another run at Board Policies or other policies?
Pres. Henry asked if there was anyone there that is on the Admin Comm.

Dist. Sec. Hossack suggested that a first meeting be scheduled and then the entire committee discuss availability as a group.
Pres. Henry stated that there is a B & F meeting scheduled for February 20th at 2:00 pm. Schedule an Admin Comm for 9:00 on a Tuesday and see who comes.
D. Loewen-Lompico said that she wants to accommodate people that work.
C. Baughman-Boulder Creek quoted from Smallman's posts.
Dir. Fultz asked to poll public members for availability
DM Rogers noted that there are contradictory statements in the Board Policy Manual. It should read that the Dist. Sec. should record the minutes and not the Committee Chair.
Dir. Fultz agreed, it must have been a bad redline.
Pres. Henry asked if any Board members have any additions to the Committees discussion.
Dir. Fultz said that he would work on the changes.

b. BOARD POLICY MANUAL UPDATE
Dir. Fultz introduced this item.
Dir. Smallman said the first item was that the Dist. Sec. would take the minutes of Board and Committee meetings.
Unidentified woman asked for clarification about a remark that Dir. Smallman made. Did he say that he didn't want anyone on the committees that didn't have his same beliefs about glyphosate?
Dir. Smallman said that he wants glyphosate banned. As a Director he can vote or not vote for somebody to get on the Environmental Committee. Personally, if he knows they are in favor of using glyphosate he would not vote for them.
Dist. Counsel Nicholls jumped in to end this discussion because this is not related to the current discussion.
Henry said that she wants the Board to cut their stipend to $50 per meeting.
Dir. Smallman wants to continue the $100 per meeting.
Dir. Fultz offered a compromise. He'd like to take this item to the Board budget discussion.
Pres. Henry doesn't believe that anyone runs for the Board to make $100. She thinks the Board needs to cut their expenses.
Dir. Fultz said that can be dealt with at the budget meeting and the Board Policy Manual can be changed.
Pres. Henry said she totally disagrees with him. This is Board Policy, it is not budget.
Dir. Smallman said he agrees it should go to the public budget.
Dir. Bruce said that she prefers to take this to the Budget Committee.
Pres. Henry said that she wants to set an example that the Board is willing to cut their budget.
Dir. Swan said that he would like to cut the stipend and he is willing to debate it at a budget discussion.
Pres. Henry said that a member of the public shall serve on no more than one standing committee.

Dir. Fultz said that the edits he made did make it into the document but not in redline form.
DC Nicholls said that she was confused. She thought that the redline from the last meeting was adopted.
Dir. Fultz said they were adopted but he added new redlines, 2 additions, one deletion but the redlines didn't get into document as redlines.
DC Nicholls said that shouldn't be a problem as long as it was clear what the Board was voting on.
Dir. Fultz said that they were things that were talked about at the last meeting, he brought them back as a proposal to discuss
DM Rogers asked to clarify. Public Committee Members shall end their term as of December 31st but can be reappointed
Dir. Bruce questioned if it would be of value to have some additional instructions that applications for reappointment shall happen in October so that in January we have a slate of applications to select from.
DM Rogers said that would be good to spell it out.
Dir. Bruce reiterated that the Board shall work with staff to describe committee appointment opportunities for publication in October.
DM Rogers clarified that the existing committee members would reapply.
Dir. Fultz clarified, so that candidates can be appointed or reappointed in January.
C. Finnie clarified the amount of savings with the reduction in stipends.
Pres. Henry said it would be a savings for $6000/year.
Dir. Smallman it was set at $100 per month and now we're having 2 meetings a month.
DF Hill it will keep it on par with last year's budget
N. Macy-Boulder Creek questioned the rationale for limiting the number of committees an individual can serve on.
Pres. Henry said that a lot of people applied for committees and there are only so many they can deal with and we feel like other people should have an opportunity.
T. To-Boulder Creek questioned why limit yourself for a long period of time, maybe there won't be a lot of applicants in the future.
Pres. Henry said it was limiting before because there was only one public member of a committee.
M. Lee-Ben Lomond agreed that a public committee member only serve on one committee. That way they have more time to concentrate on that one committee.
J. Mosher-questioned when staff was asked to make cuts to their budgets.
Pres. Henry said that the 3 new board members ran on a cost cutting slate.
Dir. Fultz said that over the last 2 years the Board has only had one meeting a month, effectively they wound up having two, with special meetings. The budget discussion is going to be a big one coming up soon.
D. Loewen asked for LADOC strike "no more than 5 members" should be "shall consist of 5 members". Form 700 not required as members of the public and needs to be changed on the Board Policy Manual.
Dir. Fultz read the section in question. He questioned if she wanted the whole paragraph removed.

D. Loewen continued regarding the LADOC ethics policy. She likes the idea of only allowing one committee for an individual.
C. Finnie questioned if there was a report of actions in closed session. The answer was yes.
T. To agreed that the stipend discussion should go to the Budget Committee.
Dir. Fultz consulted Dist. Counsel regarding the committee members' obligations under Form 700 and the Conflict of Interest Code.
DC Nicholls said that the language in the Board Policy Manual is inoperable until the Conflict of Interest Code and is approved by the County.
Dir. Bruce referenced page 19 conflicts with the minutes.
Dir. Fultz to summarized the changes.
C. Baughman questioned only one committee per person. He thinks Jenni Gomez is being singled out.
Pres. Henry questioned if Mr. Baughman is trustworthy.
C. Baughman said that personal attacks on members of the public is probably illegal under the first amendment.
V. Champlin said that comment was disingenuous. More importantly it is exactly stacking the committees with people the Board wants is something we need to avoid. Diversity is a way to combat that.
G. Lyons said he doesn't object to appoint just one person to a committee. The comments about specialization makes sense. But why a policy that ties your hands when you can just make it your preference.
M. Lee said he thinks the Board has to try to keep it neutral and non-political.
Dir. Smallman said he is against glyphosate and that's his position. He said he would to see Jenni back on the Environmental Committee.
Dir. Bruce suggested a modification to say that the Board shall have a preference that individuals not serve on more than one committee but if qualified may.
Dir. Fultz made a motion to adopt Resolution No. 27 (18-19) approval of Board Policy Manual 2019 with the changes that we have described earlier.
Dir. Swan seconded.
All present voted in favor of the motion. Motion passed.

10. New Business:
    a. SLVWD-SVWD JOINT BOARDS RETREAT
    Henry introduced.
    DM Rogers said that since this item was posted to the agenda, the General Manager of SVWD, Piret Harmon, has offered to host this meeting at their expense and limit it to the Directors and management staff of SLVWD and SVWD and not include the SMGWMA Board. It is a 6-hour retreat with a lunch in the middle. Dates suggested were March 25th and March 27th.
    Dir. Smallman requested that this occur on the weekend and if not that it be videotaped.
    Dir. Fultz said the generosity of the SVWD is very moving. He asked what is the agenda, objective and goals?

DM Rogers said it is a team building to get to know one another. In the past these 2 Districts would get together for an annual dinner to keep communications open.
Dir. Swan questioned the need for 6 hours.
Pres. Henry asked if there will be facilitators.
Dir. Fultz questioned if it is just the presentation.
DM Rogers said he is hearing that the Board is interested but would prefer a weekend.
Dir. Fultz said he would like to start with just a dinner.
Dir. Bruce said she thinks it has to be noticed.
Dir. Fultz questioned if that means if somebody shows up Scotts Valley will buy their dinner.
DM Rogers said he would see if the time of the retreat can be cut.
D. Loewen agreed with Fultz that a dinner is a good idea.

b. SLVWD WATER SUPPLY OUTLOOK AND ENVIRONMENTAL DEPARTMENT WORKSHOP
Presentation by J. Michelsen, Environmental Programs Manager on the Environmental Action plan for the District. Discussion by Board, staff and public at the end of the presentation.

Here is a link to the presentation:
slvwd.com/workshop/Env%20Dept%20Workshop%20V6%20Final.pdf

c. WATER AVAILABILTY ASSESSMENT FOR SAN LORENZO RIVER WATERSHED CONJUNCTIVE USE PLAN
This item was continued to the next meeting.
Discussion by the Board and staff regarding the Water Availability Assessment for San Lorenzo River Watershed Conjunctive Use Plan.

11. Consent Agenda:
    a. MINUTES FROM BOARD OF DIRECTORS MEETING JANUARY 17, 2019
    Consideration and possible action by the Board to approve minutes from the January 17, 2019 BoD meeting.
    Dir. Fultz made a motion to accept the minutes and Dir. Smallman seconded. All present voted in favor of accepting the minutes.

12. Written Communication:
    - Email from B. Holloway
    - Email from M. Lee-Lake Nacimeinto
    - Email from M. Lee-Santa Clara Water
    - Letter from D. Cox

13. Informational Material:
    - Letter from CSDA with Board Member Handbook & SDLA Conference

14. Adjournment 10:07 pm

MEMO

To: Board of Directors

From: District Manager

Subject: January 2019 Administration Department Monthly Report

Date February 21, 2019,

Recommendation

It is recommended that the Board of Directors review and file the Administration Department Monthly Report for January 2019.

PROBATION TANK REPLACEMENT

The Probation Tank Construction project is continuing. During the reporting period the contractor is still submitting material submittals and has moved equipment on site. Construction activities at the site started the week of December 10, 2018. Project completion date is September 27, 2019.

LOMPICO ASSESSMENT DISTRICT PROJECT

Sealed bids have been received for the replacement of the six (6) PRV stations in Lompico and will be reviewed by the Board of Directors at the January 21st meeting. Staff has been working with engineering consultants on the design of the water storage tanks and PRV replacement projects. Six redwood tanks and six PRV's are being replaced as part of the consolidation assessment district. The draft engineering report will be submitted to the Engineering Committee for comment at the March 5, 2019 meeting.

BEAR CREEK WASTEWATER

Staff is reviewing the draft Request for Proposal for a Capital Improvement Study and will have for review at the March 5, 2019 Engineering Committee. Staff is working with the County of Santa Cruz with an application to the Regional Water Quality Board for a Technical Assistance Grant in the amount of $900,000 dollars for design/construction regarding modifications to the Bear Creek Estates Wastewater Facility.

The District may be eligible for the small community wastewater program which is funded through Prop 1 and could also potentially help with implementation. We will need to do an income survey to get those funds, which would be less competitive. There is funding in Prop 1 that can pay for the income survey, as well as technical assistance of various types. The first step is to submit an application and it has just been submitted by the County.

BOARD OF DIRECTORS MEETING SUBJECT CALENDAR

Staff is moving forward with a Board of Directors meeting agenda schedule. The calendar will have a schedule of board and committee meeting dates and topics that will assist staff and the Board in planning and work in conjunction with the Strategic Plan.

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: February 21, 2019

RECOMMENDATION:

It is recommended that the Board of Directors review and file the Finance & Business Services Department Status Report.

BACKGROUND:

BUDGET
The next Budget & Finance Committee meeting we will go over the FY1718 Budget vs. Actual results. This will also be part of the Financial review for the full Board at the first meeting in March 2019.

Part of the Budget vs. Actual review helps prepare for the next FY budget as well. We are also compiling the Q2 results, which give us a 6 month look at the current year to also assist in budgeting.

LOANS – FEMA, USDA & OTHER LOANS
USDA: The District received the formal Letter of Conditions from the USDA. This officially allocates the $8.8M funding needed for the listing of projects. This is only the first steps, there is still a long road ahead for getting these projects going, bridge financing and all the terms for USDA. These projects include the Swim Tanks replacement and 5 separate water pipeline projects.

Loans: The District did receive the funding for the $2M loan to cover the Probation Tank project. The project should be well on its way in the upcoming months.

CUSTOMER SERVICE SUPPORT
Customer Service stats and information is included in this status report for review.

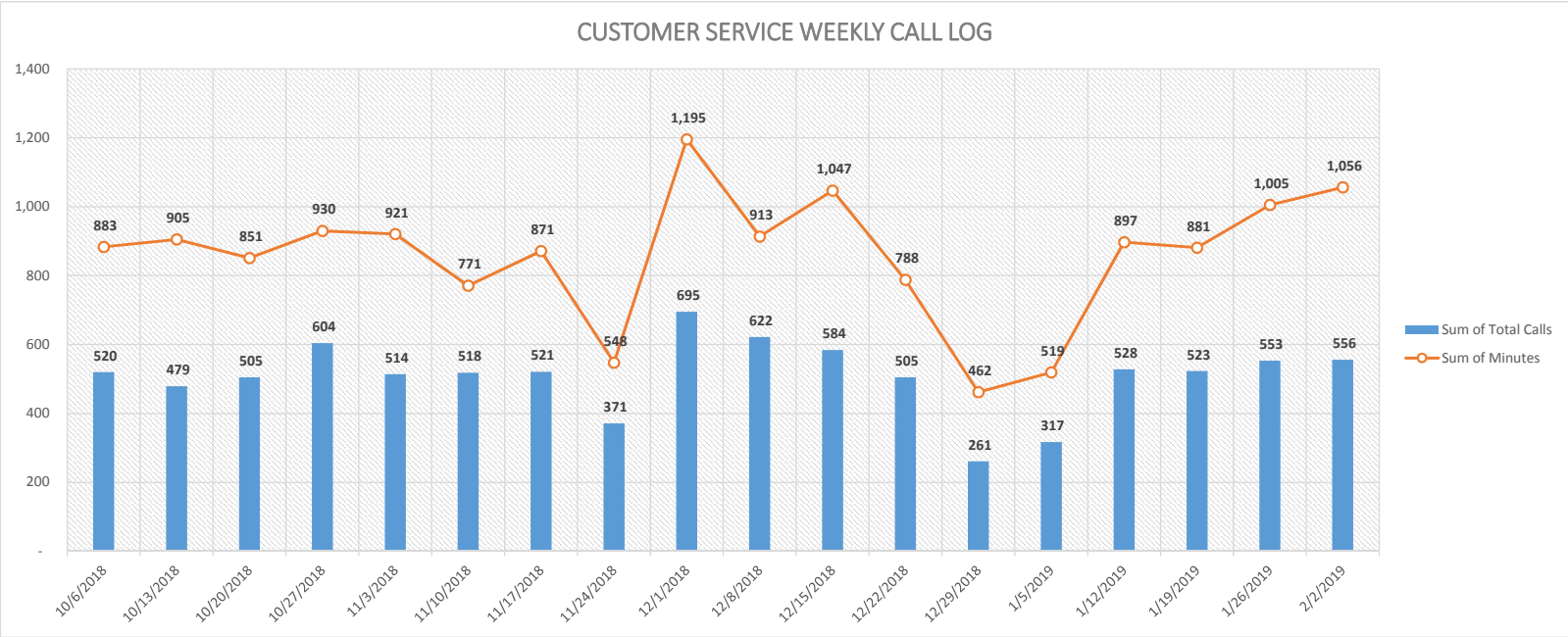
BILL LIST
The Bill List is included in this status report for review.

FINANCIAL SUMMARY
The Q2 FY1819 and the December 2018 results are herein.

In summary, revenue is tracking slightly higher than budget. Thus far customers have not made significant reductions in consumption with the shift of consumption charges. Expenses are tracking slightly better than budget.

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 December, 2018 consumption, the cumulative consumption is 3% above the baseline. There are no triggers identified per the revenue stabilization rate policy.

QUARTERLY LEAK ADJUSTMENT REPORT
This packet contains the quarterly leak adjustment report. Q2 totals were $5,680, bringing YTD to $15,628.



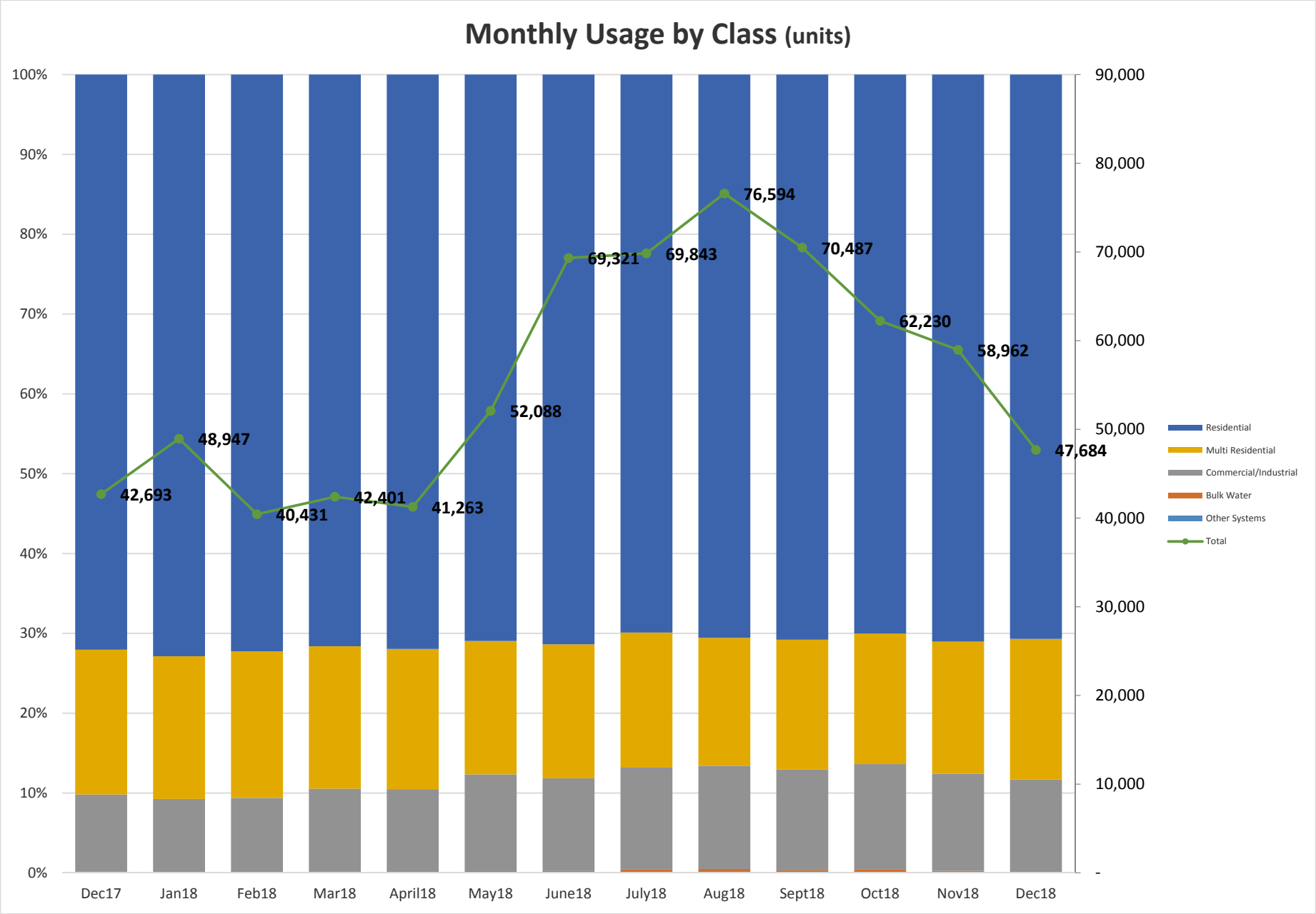
	Incoming Calls		Outgoing Calls		Total Calls		Weekly Notes
Week Ending	# Calls	Minutes	# Calls	Minutes	# Calls	Minutes	
10/6/2018	309	711	211	172	520	883	Turn offs, Main Break: 18674 HWY 9 & Sylvan, Igo Way
10/13/2018	307	675	172	230	479	905	Main Breaks: 10065 East Zayante Rd, 150 Pike dr, Lost Acre Dr,
10/20/2018	303	675	202	176	505	851	Tags, Main Breaks:10820 Westwood Rd, 14070 West Park Ave, 313 Madrone Ave,Whispering Pines, 10820 Westwood, 9795 Central Ave,190 Willowbrook, Bar King Rd,Kings Creek Rd,
10/27/2018	348	774	256	156	604	930	Turn Offs, Main Breaks:260 Riverside Park Dr, 13515 West Park Ave, 560 River Dr, 15840 Kings Creek Rd,615 Wente St, Love Creek and Sunnyside, End of Balch Wy, Old County Rd,
11/3/2018	329	731	185	190	514	921	Tags, Main Breaks: 8050 Hermosa, 200 Buena Vista,
11/10/2018	312	639	206	131	518	771	Turn offs, Main Breaks: 305 Mira Flores
11/17/2018	305	654	216	217	521	871	Main Breaks: 300 Capelli Drive, 182 Russell St - CDF Station, Ridge Dr - twice
11/24/2018	232	437	139	111	371	548	Tags, Main Breaks: 822 Applewood Dr, 409 Hillside, 610 Redwood Dr, 273 Ada Ave, 1463 Two Bar Rd, 184 Madrona Rd, Kessler Dr, 214 Circle Dr, 220 Estates Dr, 219 Bean Ave
12/1/2018	401	889	294	306	695	1,195	Turn offs & Tags, Main Break: Blue Ridge Road, 335 Vista Terrace, 381 Middleton Dr, 1463 Two Bar #5, 9095 Glen Arbor Rd.
12/8/2018	330	618	292	295	622	913	Turn offs, Main Breaks: hwy 9 & Graham Hill Rd., 6630 Hwy 9, 6706 hwy 9, 11247 hwy 9, Lorenzo Ln & Hwy 9, 15610 Hwy 9, 10990 Riverside Rd., California Dr. East Creek Bridge, 261 Main St., 730 Sugar Pine Rd., Sunnyside & Main St., 10405 Lake Blvd.,
12/15/2018	350	757	234	289	584	1,047	Tags, Main Break: 6 Ridgewood Dr.
12/22/2018	288	580	217	208	505	788	Turn offs, Main Breaks: 9460 Sunnyside, 305 Reynolds Dr., Across the St. from 10825 Lake Blvd.
12/29/2018	202	411	59	51	261	462	15965 Kings Creek Rd., 200 Caledonium Ave., 11101 Sequoia Ave., 8937 Glen Arbor Rd. *(closed 2 days)*
1/5/2019	240	449	77	70	317	519	Tags, Main Breaks: 10926 Sequoia Ave. *(closed 2 days)*
1/12/2019	319	679	209	217	528	897	Turn offs, Main Breaks: Quail 4A Well, 8945 Redwood Dr., 8255 Oak Ave., 9695 Live Oak Ave., Road Work; 1090 Pine Drive
1/19/2019	317	704	206	176	523	881	Tags, Main Breaks; 1160 Lakeside Dr., Water Line Replacement.
1/26/2019	314	765	239	240	553	1,005	Turn offs, Main Breaks; 10641 Visitar St., 225 Band Rd.
2/2/2019	318	869	238	186	556	1,056	Tags, (closed 1 day), Main Breaks; 13515 West Park Ave., 334 More Dr., 5765 Hillside Dr., 11844 Sunset Ct., 9545 Central Ave.

CUSTOMER SERVICE DEPT SUMMARY

						**				*	**		
Monthly Stats:	**Jan-19**	**Dec-18**	**Nov-18**	**Oct-18**	**Sep-18**	**Aug-18**	**Jul-18**	**Jun-18**	**May-18**	**Apr-18**	**Mar-18**	**Feb-18**	**Jan-18**
Cut In/Outs	58	34	63	66	59	77	86	59	68	58	30	42	61
Final Bills	56	32	64	74	64	115	40	66	71	42	34	58	57
Tags	210	157	191	158	206	275	176	121	232	72	312	198	194
Turn-offs	38	25	26	42	32	36	22	23	25	29	24	32	26
Online / Going Green [1]													
As of 02/04/2019													
Online Sign-ups	4,078	4,033	3,980	3,938	3,883	3,839	3,779	3,726	3,680	3,636	3,599	3,543	3,499
E-Bills	1,356	1,326	1,302	1,284	1,260	1,238	1,210	1,193	1,174	1,157	1,145	1,120	1,092
Auto Pay	2,716	2,673	2,638	2,603	2,553	2,509	2,492	2,463	2,445	2,427	2,386	2,350	2,316

* Due to timing, only had 1 tag/turn off cycle
** Due to timing, had 3 tag/turn off cycle

[1] Please note these numbers are slightly higher than actuals being utilized. When a person closes their account, they typically leave their online account active for a while for their own personal records. We currently do not have an easy way to break down to only active customers.


Monthly Usage by Class (units)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
-
42,693
48,947
40,431
42,401
41,263
52,088
69,321
69,843
76,594
70,487
62,230
58,962
47,684
Dec17
Jan18
Feb18
Mar18
April18
May18
June18
July18
Aug18
Sept18
Oct18
Nov18
Dec18
Residential
Multi Residential
Commercial/Industrial
Bulk Water
Other Systems
Total

Accounts Payable

Outstanding Invoices

13060 Highway 9
Boulder Creek, CA 95006-9119
(831) 338-2153 phone
(831) 338-7986 fax

User: KendraNegro
Printed: 2/8/2019 - 9:52 AM
Date Type: JE Date
Date Range: 01/09/2019 to 02/08/2019

Vendor / Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
00047 - SOIL CONTROL LAB						
01-800-5202	1/17/2019	1/11/2019	9010056	00148-07-2019	29.00	WATER ANALYSIS_PASO WELL #8
Task Label:		Type:	PO Number:	0000101098		
01-800-5202	1/17/2019	1/11/2019	9010170	00148-07-2019	145.00	WATER ANALYSIS_5 LOCATIONS
Task Label:		Type:	PO Number:	0000101098		
01-800-5202	1/22/2019	1/18/2019	9010024	00186-07-2019	39.00	WATER ANALYSIS_OLY WELL #3
Task Label:		Type:	PO Number:	0000101098		
01-800-5202	1/22/2019	1/18/2019	9010171	00186-07-2019	39.00	WATER ANALYSIS_OLY 2
Task Label:		Type:	PO Number:	0000101098		
01-800-5202	1/22/2019	1/18/2019	9010399	00186-07-2019	145.00	WATER ANALYSIS_5 LOCATIONS
Task Label:		Type:	PO Number:	0000101098		
01-800-5202	1/30/2019	1/28/2019	9010563	00277-07-2019	145.00	WATER ANALYSIS_5 LOCATIONS
Task Label:		Type:	PO Number:	0000101098		
Total for Vendor 00047 - SOIL CONTROL LAB:					542.00	
00265 - COMMUNITY TELEVISION						
01-100-5200	1/22/2019	1/16/2019	2604	00186-07-2019	500.50	REGULAR MEETING COVERAGE_DECEMBER 13TH,2018
Total for Vendor 00265 - COMMUNITY TELEVISION:					500.50	
00329 - GRAINGER						
01-800-5300	1/30/2019	1/24/2019	9067889551	00277-07-2019	392.50	LAB SUPPLIES_WTP
Total for Vendor 00329 - GRAINGER:					392.50	
00343 - ERNIE'S SERVICE CENTER						
01-400-5410	1/30/2019	1/24/2019	74077	00277-07-2019	391.76	AIR COMPRESSOR SERVICE_OPS
01-200-5410	1/30/2019	1/25/2019	74232	00277-07-2019	622.89	POWER STEERING HOSE REPAIR VE-120_WO#97
01-400-5410	1/30/2019	1/24/2019	74265	00277-07-2019	93.67	SERVICE FOR VE-275_OPS
Total for Vendor 00343 - ERNIE'S SERVICE CENTER:					1,108.32	

Vendor / Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
00409 - EASYPERMIT POSTAGE						
01-200-5610	1/24/2019	1/11/2019	011119_409	00200-07-2019	-93.42	FEE CREDIT ADJUSTMENT
Total for Vendor 00409 - EASYPERMIT POSTAGE:					-93.42	
00450 - EUROFINS						
01-800-5202	1/17/2019	1/16/2019	L0432098	00148-07-2019	50.00	WATER ANALYSIS_PASO 7
Task Label:		Type:	PO Number:	0000101092		
01-800-5202	1/30/2019	1/30/2019	L0434198	00277-07-2019	2,805.00	WATER ANALYSIS_PASO WELL #8
Task Label:		Type:	PO Number:	0000101092		
Total for Vendor 00450 - EUROFINS:					2,855.00	
00589 - RONALD RAY GREENLY						
01-800-5200	1/30/2019	1/15/2019	7679	00277-07-2019	300.00	SEPTIC TANK PLUMBING (KIRBY PLANT)
Task Label:		Type:	PO Number:	0000101086		
Total for Vendor 00589 - RONALD RAY GREENLY:					300.00	
00722 - SWRCB - ELAP						
01-800-5320	1/17/2019	12/19/2019	LW-1021255	00151-07-2019	7,242.50	SLV FELTON SYSTEM FEES_WTP
01-800-5320	1/17/2019	12/19/2019	LW-1021260	00151-07-2019	21,736.00	SLV NORTH SOUTH SYSTEM FEES_WTP
Total for Vendor 00722 - SWRCB - ELAP:					28,978.50	
00727 - ULINE SHIPPING SUPPLIES						
01-800-5300	1/30/2019	1/24/2019	105231607	00277-07-2019	382.39	NITRILE GLOVES_WTP
Total for Vendor 00727 - ULINE SHIPPING SUPPLIES:					382.39	
00729 - ALPHA ANALYTICAL LABS						
02-600-5202	1/17/2019	1/16/2019	9012842	00148-07-2019	55.00	LAB FEES-ANALYTICAL SERVICES
Task Label:		Type:	PO Number:	0000101087		
02-600-5202	1/22/2019	1/21/2019	9013234-SLVWD	00186-07-2019	1,132.00	LAB FEES-ANALYTICAL SERVICES
Task Label:		Type:	PO Number:	0000101087		
Total for Vendor 00729 - ALPHA ANALYTICAL LABS:					1,187.00	
10158 - NOSSAMAN, LLP						
01-100-5210	1/30/2019	1/23/2019	491537A	00277-07-2019	18,588.00	FEES FOR PROFESSIONAL SERVICES RENDERED THROUGH 12/31/2018
01-100-5210	1/30/2019	1/23/2019	491537B	00277-07-2019	1,039.96	DISBURSEMENTS MADE TO ACCOUNT THROUGH 12/31/2018

Vendor / Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
Total for Vendor 10158 - NOSSAMAN, LLP:					19,627.96	
UB*00543 - SCOTTS VALLEY PROPERTY MANAGEMENT						
01-000-2100	1/31/2019	1/31/2019		00286-07-2019	33.93	Refund Check
Task Label:		Type:	PO Number:			
Total for Vendor UB*00543 - SCOTTS VALLEY PROPERTY MANAGEMENT:					33.93	
UB*00544 - ERIC CUMMINS						
01-000-2100	2/1/2019	2/4/2019		00006-08-2019	71.31	Refund Check
Task Label:		Type:	PO Number:			
Total for Vendor UB*00544 - ERIC CUMMINS:					71.31	
UB*00545 - M AMOLSCH						
01-000-2100	2/1/2019	2/4/2019		00006-08-2019	8.32	Refund Check
Task Label:		Type:	PO Number:			
Total for Vendor UB*00545 - M AMOLSCH:					8.32	
UB*00546 - Teresa Bell						
01-000-2100	2/1/2019	2/4/2019		00006-08-2019	30.36	Refund Check
Task Label:		Type:	PO Number:			
Total for Vendor UB*00546 - Teresa Bell:					30.36	
UB*00547 - LEON KHAIMOVICH						
01-000-2100	2/1/2019	2/4/2019		00006-08-2019	245.89	Refund Check
Task Label:		Type:	PO Number:			
Total for Vendor UB*00547 - LEON KHAIMOVICH:					245.89	
UB*00548 - David & Joanna Schwarcz						
01-000-2100	2/1/2019	2/4/2019		00006-08-2019	17.14	Refund Check
Task Label:		Type:	PO Number:			
Total for Vendor UB*00548 - David & Joanna Schwarcz:					17.14	
Report Total:					56,187.70	

Accounts Payable

Checks by Date - Detail by Check Number

User: KendraNegro
Printed: 2/8/2019 9:47 AM

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	02/01/2019		
	FEB 2019.1	CALPERS HEALTH			2,367.94
	FEB 2019.2	CALPERS HEALTH			13,756.51
	FEB 2019.3	CALPERS HEALTH			768.25
	FEB 2019.4	CALPERS HEALTH			17,450.26
	FEB 2019.5	CALPERS HEALTH			2,765.70
	FEB 2019.6	CALPERS HEALTH			900.00
	FEB 2019.7	CALPERS HEALTH			9,276.38
	FEB 2019.8	CALPERS HEALTH			122.48
	FEB 2019.9	CALPERS HEALTH			1,821.70
			Total for this ACH Check for Vendor 00178:	0.00	49,229.22
ACH	00054	PACIFIC GAS AND ELECTRIC	01/16/2019		
	0119_2564996928	UTILITIES_1150 REBECCA DRIVE			36.94
	0119_6279346884	UTILITIES_19 SUMMIT AVE			468.29
	0119_7179253583	UTILITIES_LOMPICO			447.14
	0119_9655817646	UTILITIES_140 ELENA COURT			10.47
	DEC_2836470071	UTILITIES_OPS			982.75
	DEC_3658024062A	UTILITIES_ADMIN			544.58
	DEC_3658024062B	UTILITIES_OPS			5,302.57
	DEC_3658024062C	UTILITIES_WTP			19,398.17
	DEC_3658024062D	UTILITIES_BCE WASTEWATER			198.01
	DEC_97544193341	UTILITIES_OPS			82.77
			Total for this ACH Check for Vendor 00054:	0.00	27,471.69
16486	00057	AFSCME COUNCIL 57	01/10/2019		
	122018_57	UNION DUES_DEC 2018			998.66
			Total for Check Number 16486:	0.00	998.66
16487	00760	ANGELO BARTOLOTTA	01/10/2019		
	23654	BUSINESS CARDS_DIRECTOR OF OPERAT			80.80
			Total for Check Number 16487:	0.00	80.80
16488	00055	AT&T	01/10/2019		
	121918_55	PHONE_FELTON ACRES_WTP			141.53
			Total for Check Number 16488:	0.00	141.53
16489	00145	BATTERIES PLUS	01/10/2019		
	74177758	CELL PHONE CASE_WTP			65.39
			Total for Check Number 16489:	0.00	65.39
16490	UB*00537	MICHAEL BROACH	01/10/2019		
		Refund Check			51.90

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
			Total for Check Number 16490:	0.00	51.90
16491	00788	COMCAST	01/10/2019		
	1218_0987198	INTERNET_195 KIRBY			153.29
			Total for Check Number 16491:	0.00	153.29
16492	00505	DELL MARKETING LP	01/10/2019		
	10288492064	NEW MONITOR_FIN			275.33
			Total for Check Number 16492:	0.00	275.33
16493	UB*00533	Marcie & Frank Eryavec	01/10/2019		
		Refund Check			40.09
			Total for Check Number 16493:	0.00	40.09
16494	00204	FEDERAL EXPRESS CORP	01/10/2019		
	4489035202	KIRBY PLANT PUMP_SHIPPING CHARGES			358.21
			Total for Check Number 16494:	0.00	358.21
16495	00589	RONALD RAY GREENLY	01/10/2019		
	7664	SEPTIC TANK PLUMBING (KIRBY PLANT)			300.00
			Total for Check Number 16495:	0.00	300.00
16496	UB*00538	COLLETTA GRUCZELAK	01/10/2019		
		Refund Check			364.48
		Refund Check			191.45
			Total for Check Number 16496:	0.00	555.93
16497	00216	B C AUTO PARTS, KATHLEEN GERRIT	01/10/2019		
	119519	LIGHT BULB_WIPER BLADES_VE 338			26.16
			Total for Check Number 16497:	0.00	26.16
16498	10073	KEN GIROUARD	01/10/2019		
	8	METER REVIEW_APN 079-143-01			195.00
			Total for Check Number 16498:	0.00	195.00
16499	00350	HOWARD OLIPHANT	01/10/2019		
	122718_350	EMPLOYEE REIMBURSEMENT_MEALS			15.00
			Total for Check Number 16499:	0.00	15.00
16500	UB*00484	REDWOOD EMPIRE	01/10/2019		
		Refund Check			75.00
			Total for Check Number 16500:	0.00	75.00
16501	00711	ROBERTS & BRUNE CO.	01/10/2019		
	S1802325.002A	REPAIR CLAMP 3/4" X 6"			90.14
	S1802325.002B	SADDLE DS 2.35-2.56 x 1"			50.45
	S1802325.004A	ELL 90 GALV 3/4"			4.38
	S1802325.004B	NIPPLE GALV 3/4" X 2 1/2"			7.69
	S1802325.004C	NIPPLE BRASS 3/4" X 0"			22.80
	S1802325.004D	VALVE BOX ALIGNER POSI-CAP			70.53
	S1802325.004E	BACKFLOW RED.PRESS.3/4" W/BALL			1,821.06
	S1802325.004F	16 X 125 X1 -TIGERTOOTH SUPERGRIT DIA			905.30

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
	S1802325.005	MTR VLV COPR-MTR STR 1X1X5/8"			823.67
			Total for Check Number 16501:	0.00	3,796.02
16502	UB*00535	DIANA RODROW	01/10/2019		
		Refund Check			6.31
			Total for Check Number 16502:	0.00	6.31
16503	UB*00534	SHELBY SCHEWE	01/10/2019		
		Refund Check			9.18
		Refund Check			10.39
			Total for Check Number 16503:	0.00	19.57
16504	UB*00536	MIKE SCHULTS	01/10/2019		
		Refund Check			8.98
		Refund Check			19.29
			Total for Check Number 16504:	0.00	28.27
16505	00727	ULINE SHIPPING SUPPLIES	01/10/2019		
	104168748	LOCKERS/WALL MOUNTED COAT RACK			916.90
			Total for Check Number 16505:	0.00	916.90
16506	10217	UMPQUA BANK	01/10/2019		
	123118_A	OFFICE SUPPLIES_ADMIN			194.90
	123118_B	EMPLOYEE UNIFORM_WTP			211.52
	123118_C	ADVERTISING			226.00
	123118_D	OFFICE SUPPLIES_WTP			33.27
	123118_E	TECH SUPPORT_ADMIN			173.25
	123118_F	OFFICE SUPPLIES_FIN			31.65
	123118_G	BROWN & CALDWELL_ENG			200.00
	123118_H	SANTA CRUZ JOBS_ENG			304.15
	123118_I	OFFICE SUPPLIES_ADMIN			42.49
	123118_J	TRAINING_ENVIR			135.00
	123118_K	OFFICE SUPPLIES_ADMIN			110.38
	123118_L	EMPLOYEE UNIFORMS_WTP			341.71
	123118_M	HIRE RIGHT_WTP			39.95
	123118_N	LINKEDIN TRAINING_FIN			29.99
	123118_O	WEB NETWORK SOLUTIONS_ADMIN			119.97
	123118_P	EMPLOYEE UNIFORM_WTP			141.03
	123118_Q	ARS RESCUE ROOTER_BCE WASTEWATER			1,500.00
	123118_R	EMPLOYEE UNIFORMS_WTP			526.12
	123118_S	OFFICE SUPPLIES_ADMIN			10.84
	123118_T	ADVERTISING			50.00
	123118_U	OFFICE SUPPLIES_ADMIN			49.78
			Total for Check Number 16506:	0.00	4,472.00
16507	00599	WEX BANK	01/10/2019		
	57217832A	GAS_ADMIN			755.36
	57217832B	OTHER ADJ			326.78
	57217832C	GAS_OPS			2,822.86
	57217832D	GAS_WTP			1,745.19
	57217832E	BANK CHARGE REVERSAL			-342.47
			Total for Check Number 16507:	0.00	5,307.72
16508	10236	ZIP'S TRUCK EQUIPMENT, INC	01/10/2019		
	613712	SHOVEL MOUNTS FOR TRUCKS			193.96

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
	613717	WHEEL CHOCKS FOR VARIOUS VEHICLES			185.64
			Total for Check Number 16508:	0.00	379.60
16509	00342	BRASS KEY LOCKSMITH	01/11/2019		
	950057	DISTRICT LOCKS_SPARK FM KEYS			463.00
			Total for Check Number 16509:	0.00	463.00
16510	00479	THE CLIMATE REGISTRY	01/11/2019		
	CBR6267	ANNUAL CLIMATE REGISTRY MEMBERSH			750.00
			Total for Check Number 16510:	0.00	750.00
16511	00788	COMCAST	01/11/2019		
	0119_0302438	INTERNET_1075 WHISPERING PINES DR			193.38
			Total for Check Number 16511:	0.00	193.38
16512	00788	COMCAST	01/11/2019		
	0119_1236033	INTERNET_215 BLACKSTONE DRIVE			174.79
			Total for Check Number 16512:	0.00	174.79
16513	00703	DATAFLOW BUSINESS SYSTEMS, INC	01/11/2019		
	254675	CONTRACT SERVICES FOR PRINTERS/COF			74.68
	254676	CONTRACT SERVICES FOR PRINTERS/COF			121.75
	254677	CONTRACT SERVICES FOR PRINTERS/COF			79.99
	254678	CONTRACT SERVICES FOR PRINTERS/COF			42.94
	255358	CONTRACT SERVICES FOR PRINTERS/COF			22.55
	255455	CONTRACT SERVICES FOR PRINTERS/COF			16.06
			Total for Check Number 16513:	0.00	357.97
16514	00037	CO. OF SANTA CRUZ DEPT OF PUBLIC	01/11/2019		
	12282018_37	BLANKET ENCROACHMENT PERMIT FEE_			4,642.00
			Total for Check Number 16514:	0.00	4,642.00
16515	00750	FEDAK & BROWN, LLP	01/11/2019		
	122318_750	PROFESSIONAL SERVICES FOR DECEMBE			1,190.00
			Total for Check Number 16515:	0.00	1,190.00
16516	00164	FIRST ALARM	01/11/2019		
	443004	ALARM PROGRAMING_365 MADRONE DR			123.75
	443028	ALARM PROGRAMING_13057 HWY 9			123.75
			Total for Check Number 16516:	0.00	247.50
16517	UB*00522	HARVEY FOX	01/11/2019		
		Refund Check			105.69
		Refund Check			13.66
			Total for Check Number 16517:	0.00	119.35
16518	UB*00300	GARY GARRICK	01/11/2019		
		Refund Check			48.43
			Total for Check Number 16518:	0.00	48.43
16519	00080	GRANITE CONSTRUCTION CO	01/11/2019		
	1517966	BACKFILL_BASE ROCK_OPS			72.26

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
			Total for Check Number 16519:	0.00	72.26
16520	10018	HOLLY HOSSACK	01/11/2019		
	112918_10018	TRAVEL REIMBURSEMENT			14.72
			Total for Check Number 16520:	0.00	14.72
16521	UB*00252	Amalia Laugesen	01/11/2019		
		Refund Check			22.85
		Refund Check			15.81
			Total for Check Number 16521:	0.00	38.66
16522	00082	MID VALLEY SUPPLY	01/11/2019		
	232669	PAPERTOWELS_OPS			73.78
			Total for Check Number 16522:	0.00	73.78
16523	10067	NBS	01/11/2019		
	1218000091A	QUARTERLY FEES			1,125.00
	1218000091B	QUARTERLY FEES			750.00
	1218000091C	REIMBURSABLE EXPENSES			24.43
	1218000091D	REIMBURSABLE EXPENSES			16.29
			Total for Check Number 16523:	0.00	1,915.72
16524	00027	NORTH BAY FORD	01/11/2019		
	330205	SERVICE FOR VE-122			102.23
			Total for Check Number 16524:	0.00	102.23
16525	00695	PAUL JENSEN	01/11/2019		
	111618_695	WELLS ROAD_BOOSTER HYDRO STATION			790.00
			Total for Check Number 16525:	0.00	790.00
16526	00264	RAIN FOR RENT	01/11/2019		
	1293026	PASO WELL #8 DISCHARGE PUMPING			3,065.05
			Total for Check Number 16526:	0.00	3,065.05
16527	10151	OSCAR RODAS	01/11/2019		
	227447	MAINTENANCE_DECEMBER			250.00
			Total for Check Number 16527:	0.00	250.00
16528	00125	SCARBOROUGH LUMBER	01/11/2019		
	326222	MISC SUPPLIES_OLY 2 INSTALL			27.52
	326260	SEWER REPAIR_BCE WASTEWATER			608.33
	326272	SEWER REPAIR_BCE WASTEWATER			39.72
	326273	SAWZALL RETURN_CREDIT			-195.29
	326283	FUSE_LYON PLANT_WTP			11.58
	326343	REPAIRS_BCE WASTEWATER			24.15
	326375	ADMIN BLDG_VEHICLE DAMAGE			13.52
	326376	ADMIN BLDG_VEHICLE DAMAGE			4.71
	326422	PINE BOARD_MEASURE TAPE			38.76
	326940	SUPPLIES_ADMIN			74.62
	326946	GRINDING WHEEL_GLOVES			25.12
	327023	SUPPLIES_RIDGEWOOD SEWER LINE_BCI			81.46
	327145	SHELF LINER FOR TOOL BOX_WO#831			15.44
	327162	MANANA WOODS PLANT_GATE REPAIR			49.29

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
	327208	MEASURING TAPE			16.43
	327237	ADMIN BLDG_LIGHTING REPAIR			28.98
	327248	MITCHELL HYDRO EXPANSION			39.99
	579134	PVC PARTS_SERVICE LINE REPAIR			26.63
	579156	SEWER REPAIR_BCE WASTEWATER			274.27
	579158	SEWER PARTS_BCE WASTEWATER			11.59
	579218	HOUSEHOLD SUPPLIES_LYON PLANT_WT			67.74
	579284	LIQUID BLEACH_OPS			7.51
	579373	TRASH BAGS_SAW BLADES			7.34
	579379	GASKET METERING			6.83
	579380	GASKET RETURN_CREDIT			-5.45
	579399	TOILET SEAT_ADMIN BLDG			49.82
	579593	SET UP NEW SCADA COMPUTERS_WO#97(			64.74
	579648	SHELF LINER FOR TOOL BOX_WO#831			30.89
	579652	ANT BAIT TRAPS			15.45
	579736	MITCHELL HYDRO EXPANSION			27.80
			Total for Check Number 16528:	0.00	1,489.49
16529	00168	SCOTTS VALLEY SPRINKLER	01/11/2019		
	152675	EROSION MATERIAL #6 RIDGEWOOD SEW			129.06
			Total for Check Number 16529:	0.00	129.06
16530	01056	BEAU SIFTON	01/11/2019		
	122718_1056	OT MEAL REIMBURSEMENT			15.00
			Total for Check Number 16530:	0.00	15.00
16531	10184	THATCHER COMPANY, INC	01/11/2019		
	260154	CL2 FOR KWTP			2,280.45
			Total for Check Number 16531:	0.00	2,280.45
16532	10119	TAYLOR TOCCALINO	01/11/2019		
	122718_10119	OT MEAL REIMBURSEMENT			10.85
			Total for Check Number 16532:	0.00	10.85
16533	10242	VALLEY WOMEN'S CLUB ASSOCIATIC	01/11/2019		
	12202018_10242	SUPPORT OF THE NCCC AMERICORPS TEA			1,000.00
			Total for Check Number 16533:	0.00	1,000.00
16534	00362	ACCELA, INC #774375	01/16/2019		
	ACC43520A	WEB PAYMENTS_ONLINE BILLS			185.00
	ACC43520B	WEB PAYMENTS_TRANSACTION FEE			2,643.00
			Total for Check Number 16534:	0.00	2,828.00
16535	00055	AT&T	01/16/2019		
	119_9607360489A	PHONE_ADMIN			208.75
	119_9607360489B	PHONE_OPS			4,074.17
	119_9607360489C	PHONE_WTP			2,309.36
	119_9607360489D	PHONE_BCE WASTEWATER			388.39
			Total for Check Number 16535:	0.00	6,980.67
16536	00309	AT&T IP SERVICES	01/16/2019		
	1617175400	IP SERVICES_195 KIRBY_WTP			273.18

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
			Total for Check Number 16536:	0.00	273.18
16537	00686	AT&T LONG DISTANCE	01/16/2019		
	0119_834287386A	LONG DISTANCE_ADMIN			154.26
	0119_834287386B	LONG DISTANCE_OPS			19.28
	0119_834287386C	LONG DISTANCE_WTP			10.87
			Total for Check Number 16537:	0.00	184.41
16538	10025	BADGER METER, INC	01/16/2019		
	80027870	BEACON SERVICES_DECEMBER 2018			1,433.79
			Total for Check Number 16538:	0.00	1,433.79
16539	00609	BALANCE HYDROLOGICS, INC	01/16/2019		
	217018-1218	STREAM MONITORING PROGRAM_END O			705.00
	218018-1218	STREAM MONITORING PROGRAM_YEAR			1,892.05
	218018-T10A_609	FALL CREEK DEBRIS REMOVAL_TIME CH			650.00
			Total for Check Number 16539:	0.00	3,247.05
16540	00220	BAY BUILDING JANITORIAL,INC	01/16/2019		
	31959	JANITORIAL SERVICES_JAN2019			424.42
			Total for Check Number 16540:	0.00	424.42
16541	10207	CITI CARDS_COSTCO	01/16/2019		
	010719_10207	CERTIFIED LETTER_ADMIN			6.70
			Total for Check Number 16541:	0.00	6.70
16542	00788	COMCAST	01/16/2019		
	0119_1323641	INTERNET_365 MADRONE DR OFC			264.20
			Total for Check Number 16542:	0.00	264.20
16543	00788	COMCAST	01/16/2019		
	0119_1323583	INTERNET_365 MADRONE DR			264.20
			Total for Check Number 16543:	0.00	264.20
16544	00788	COMCAST	01/16/2019		
	0119_1318955	INTERNET_1150 REBECCA DRIVE			143.29
			Total for Check Number 16544:	0.00	143.29
16545	00788	COMCAST	01/16/2019		
	0119_1318922	INTERNET_3652 GRAHAM HILL RD			143.29
			Total for Check Number 16545:	0.00	143.29
16546	00788	COMCAST	01/16/2019		
	0119_1236165	INTERNET_280 BLUERIDGE DRIVE			174.79
			Total for Check Number 16546:	0.00	174.79
16547	00788	COMCAST	01/16/2019		
	0119_1236124	INTERNET_15819 FOREST HILL DR			174.79
			Total for Check Number 16547:	0.00	174.79
16548	00788	COMCAST	01/16/2019		

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
	0119_1236058	INTERNET_17277 HWY 9			174.79
			Total for Check Number 16548:	0.00	174.79
16549	00788	COMCAST	01/16/2019		
	0119_1236017	INTERNET_295 EAST ROAD			174.79
			Total for Check Number 16549:	0.00	174.79
16550	00788	COMCAST	01/16/2019		
	0119_0956185	INTERNET_545 FALL CREEK DR			173.50
			Total for Check Number 16550:	0.00	173.50
16551	00290	CONTRACTOR COMPLIANCE & MONI	01/16/2019		
	10843	LABOR COMPLIANCE MONITORING_WO#			708.33
			Total for Check Number 16551:	0.00	708.33
16552	00273	CORELOGIC, INC.	01/16/2019		
	30402936	REALQUEST SERVICES_DECEMBER 2018			206.00
			Total for Check Number 16552:	0.00	206.00
16553	00076	ERNIE'S AUTO CENTER	01/16/2019		
	765906	STARTER BATTERY			144.21
			Total for Check Number 16553:	0.00	144.21
16554	00343	ERNIE'S SERVICE CENTER	01/16/2019		
	73520	VE-341 SERVICE_WO#97			453.53
			Total for Check Number 16554:	0.00	453.53
16555	00450	EUROFINS	01/16/2019		
	L0429467	WATER ANALYSIS_LYON WTP			15.00
			Total for Check Number 16555:	0.00	15.00
16556	00016	GREENWASTE RECOVERY,INC	01/16/2019		
	3828791	TRASH/RECYCLE/YARDWASTE SERVICES_			375.69
			Total for Check Number 16556:	0.00	375.69
16557	00550	HACH COMPANY	01/16/2019		
	11273998	REAGENT_WTP			938.97
			Total for Check Number 16557:	0.00	938.97
16558	00020	HARO, KASUNICH & ASSOCIATES	01/16/2019		
	04090-19011	LYON ACCESS ROAD_WO#549			475.00
			Total for Check Number 16558:	0.00	475.00
16559	10005	ICMA RETIREMENT C/O M & T RETIRI	01/16/2019		
	80845	RETIREMENT WITHHOLDING_PP ENDING			3,374.80
			Total for Check Number 16559:	0.00	3,374.80
16560	00058	IHWY	01/16/2019		
	12206_DEC2018	BUSINESS HOSTING_DECEMBER			25.00

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
			Total for Check Number 16560:	0.00	25.00
16561	UB*00539	CECILIA KELLY	01/16/2019		
		Refund Check			11.09
			Total for Check Number 16561:	0.00	11.09
16562	00336	LAND TRUST OF SANTA CRUZ COUNT	01/16/2019		
	12-2018	OLYMPIA PATROL SERVICE			511.55
			Total for Check Number 16562:	0.00	511.55
16563	00608	LLOYD'S TIRE SERVICE, INC	01/16/2019		
	344607	TIRES_VE-230_WO#694			904.07
	344635	TIRES_VE-228_WO#693			904.07
	356348	TIRES_VE-380_WO#118			1,006.82
	356512	FRONT END ALIGNMENT_VE-155_WO#86			129.50
			Total for Check Number 16563:	0.00	2,944.46
16564	00296	MESITI-MILLER ENGINEERING,INC	01/16/2019		
	1218004	STRUCTURAL DESIGN OF BLUE TANK FOU			193.00
	1218005	BLUE TANK BIDDING PHASE_WO#521			1,487.00
	1218025	CONSTRUCTION ADMIN_BLUE TANK_WO			3,690.60
	1218026	ELECTRICAL ENGINEERING_PROBATION			198.00
	1218027	PROBATION TANK_CONSTRUCTION SUPP			2,288.00
			Total for Check Number 16564:	0.00	7,856.60
16565	00082	MID VALLEY SUPPLY	01/16/2019		
	233069	PAPERTOWELS_WTP			147.56
			Total for Check Number 16565:	0.00	147.56
16566	00582	OLIVE SPRINGS QUARRY	01/16/2019		
	118574	PAVING_BEAR CREEK/HWY 9/RIVERDALE			251.49
			Total for Check Number 16566:	0.00	251.49
16567	00944	PDNC, INC.	01/16/2019		
	3087	MONTHLY SERVER SUPPORT_DEC			517.68
	3109	SERVICE CALL_OPS			64.07
			Total for Check Number 16567:	0.00	581.75
16568	00300	PHIL MATHEWS	01/16/2019		
	7850	OPERATIONS BUILDING TOILET			352.00
	7852	BEAR CREEK ESTATES SEWER CLEAN OU			350.00
			Total for Check Number 16568:	0.00	702.00
16569	00264	RAIN FOR RENT	01/16/2019		
	1297442	PASO WELL #8 DISCHARGE PUMP_WO#814			2,847.17
			Total for Check Number 16569:	0.00	2,847.17
16570	00001	ROYAL WHOLESALE ELECTRIC	01/16/2019		
	7719-637012	GENERATOR PLUGS			2,090.95
	7719-638338	GENERATOR PLUGS CREDIT			-2,779.50
	7719-638535	GENERATOR PLUGS_WTP			1,092.74
	7719-638845	TAPE_PLIERS_WTP			60.81

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
			Total for Check Number 16570:	0.00	465.00
16571	00746	SCOTTS VALLEY BANNER	01/16/2019		
	58150	COMMITTEE NOTICES_12/28/2018			265.00
			Total for Check Number 16571:	0.00	265.00
16572	00168	SCOTTS VALLEY SPRINKLER	01/16/2019		
	152711	CHLORINE LINE REPAIR_QUAIL BOOSTER			70.63
			Total for Check Number 16572:	0.00	70.63
16573	00721	UNITED SITE SVCS.,INC	01/16/2019		
	114-7873711	PROBATION TANK_TOILET SERVICE & CL			196.70
	114-7883513	QUAIL 5 TOILET SERVICE AND CLEANING			204.35
			Total for Check Number 16573:	0.00	401.05
16574	10072	WATER SYSTEMS CONSULTING, INC	01/16/2019		
	3582A	LOMPICO PRVS_WO#843			3,827.50
	3582B	LYON TANK ACCESS ROAD_WO#549			2,842.32
	3582C	TROUT FARM INN FIRE SERVICE			6,886.50
	3583	USDA PHASE 1 FUNDING SUPPORT_WO#9			16,595.68
			Total for Check Number 16574:	0.00	30,152.00
16575	00268	WATTS ON	01/16/2019		
	12277	GENERATOR REPLACEMENT OPS BUILDI			7,991.83
	12286	BEAR CREEK WATER WORKS			828.50
			Total for Check Number 16575:	0.00	8,820.33
16576	10023	AT & T CAPITAL SERVICES, INC	01/17/2019		
	3058408	V2 PHONE MAINTENANCE			396.07
			Total for Check Number 16576:	0.00	396.07
16577	00687	AT&T U-VERSE	01/17/2019		
	119_132166881	INTERNET_MANANA WOODS			85.00
			Total for Check Number 16577:	0.00	85.00
16578	00687	AT&T U-VERSE	01/17/2019		
	119_137458730	INTERNET_13057 HWY 9			75.00
			Total for Check Number 16578:	0.00	75.00
16579	00125	SCARBOROUGH LUMBER	01/17/2019		
	327333	MISC TOOLS_SUPPLIES_OPS			185.54
	327349	MISC SCREWS_OPS			7.50
	327378	MITCHELL HYDRO EXPANSION			160.49
	327385	ADMIN LIGHTS			11.54
	327536	TARP_WTP			37.65
	579810	MITCHELL HYDRO EXPANSION			15.45
			Total for Check Number 16579:	0.00	418.17
16580	00545	AFLAC	01/18/2019		
	006804	2019 MONTHLY INS. PREMIUMS_JAN2019			221.77
			Total for Check Number 16580:	0.00	221.77

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
16581	00057	AFSCME COUNCIL 57	01/18/2019		
	JAN2019_00057	UNION DUES_JANUARY 2019			998.66
			Total for Check Number 16581:	0.00	998.66
16582	10180	BECK'S SERVICE	01/18/2019		
	381696	SAFETY LIGHTS INSTALL_VE-234_WO#831			685.00
			Total for Check Number 16582:	0.00	685.00
16583	00343	ERNIE'S SERVICE CENTER	01/18/2019		
	73445	RADIATOR & STEERING BUSHING_VE-155			1,283.89
	73735	OIL CHANGE_SERVICE_VE-230_WO#694			111.41
	73774	TIRE REPAIR_VE-234_WO#831			20.25
			Total for Check Number 16583:	0.00	1,415.55
16584	00020	HARO, KASUNICH & ASSOCIATES	01/18/2019		
	04090-18112	SERVICES THROUGH OCTOBER 31ST, 2018			399.30
			Total for Check Number 16584:	0.00	399.30
16585	10233	SCHAAF & WHEELER, CONSULTING C	01/18/2019		
	30678	LOMPICO TANKS_PRELIMINARY DESIGN			1,682.63
			Total for Check Number 16585:	0.00	1,682.63
16586	00746	SCOTTS VALLEY BANNER	01/18/2019		
	58447	COMMITTE NOTICES_01/04/2019			265.00
			Total for Check Number 16586:	0.00	265.00
16587	00722	SWRCB - ELAP	01/18/2019		
	SW-0167156	ANNUAL PERMIT FEE_WTP			442.00
			Total for Check Number 16587:	0.00	442.00
16588	10243	WEST MARINE PRODUCTS, INC.	01/18/2019		
	4584A	RAIN GEAR_WTP			271.10
	4584B	RAIN GEAR_OPS			271.10
	6411	RAIN GEAR_WTP			209.38
			Total for Check Number 16588:	0.00	751.58
16589	00309	AT&T IP SERVICES	01/23/2019		
	6028465408A	IP SERVICES_ADMIN			249.97
	6028465408B	IP SERVICES_OPS			249.97
	6028465408C	IP SERVICES_WTP			249.97
			Total for Check Number 16589:	0.00	749.91
16590	00687	AT&T U-VERSE	01/23/2019		
	0119_132182018	INTERNET_345 QUAIL TERRACE			75.00
			Total for Check Number 16590:	0.00	75.00
16591	10244	MELISSA BRUCE	01/23/2019		
	010719_10244	EMPLOYEE REIMBURSEMENT_MILEAGE			41.76
			Total for Check Number 16591:	0.00	41.76
16592	10201	RACHEL MUNOZ	01/23/2019		
	120418_10201	EMPLOYEE REIMBURSEMENT_MILEAGE			38.69

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
			Total for Check Number 16592:	0.00	38.69
16593	10230	DAWN STILES	01/23/2019		
	120418_10230	EMPLOYEE REIMBURSEMENT_MILEAGE			44.47
			Total for Check Number 16593:	0.00	44.47
16594	00055	AT&T	01/28/2019		
	0119_8313355273	PHONE_FELTON ACRES_WTP			143.76
			Total for Check Number 16594:	0.00	143.76
16595	00309	AT&T IP SERVICES	01/28/2019		
	5301936409A	IP SERVICES_ADMIN			393.00
	5301936409B	IP SERVICES_OPS			393.01
	5301936409C	IP SERVICES_WTP			393.00
			Total for Check Number 16595:	0.00	1,179.01
16596	00687	AT&T U-VERSE	01/28/2019		
	0119_132338293	INTERNET_GRAHAM HILL			75.00
			Total for Check Number 16596:	0.00	75.00
16597	00141	B & B SMALL ENGINE	01/28/2019		
	410855	SAW REPAIR ESTIMATE FEE_OPS			20.00
			Total for Check Number 16597:	0.00	20.00
16598	00034	DAVE BASLER	01/28/2019		
	FEB2019_34	RETIRED EMPLOYEE MEDICAL_FEB2019			75.00
			Total for Check Number 16598:	0.00	75.00
16599	10173	CARLY BLANCHARD	01/28/2019		
	011619_10173	EMPLOYEE REIMBURSEMENT_MILEAGE			40.84
			Total for Check Number 16599:	0.00	40.84
16600	00099	JOEL BUSA	01/28/2019		
	FEB2019_99	RETIREE MEDICAL_FEB2019			125.00
			Total for Check Number 16600:	0.00	125.00
16601	00566	C S S C	01/28/2019		
	190100059101	ANSWERING SERVICE_USAGE PERIOD 12/			404.31
			Total for Check Number 16601:	0.00	404.31
16602	00213	CHESTNUT IDENTITY APPAREL, INC	01/28/2019		
	113727A	EMPLOYEE UNIFORM_WTP			226.71
	113727B	EMPLOYEE UNIFORM_OPS			107.96
	113727C	EMPLOYEE UNIFORM_ADMIN			21.59
			Total for Check Number 16602:	0.00	356.26
16603	00363	CINCINNATI LIFE INSURANCE CO	01/28/2019		
	FEB2019_363	201 LIFE INSURANCE_FEB2019			42.00
			Total for Check Number 16603:	0.00	42.00
16604	00137	COLLEEN NEVINS	01/28/2019		

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
	82964	9 NAME PLATES			142.57
			Total for Check Number 16604:	0.00	142.57
16605	01050	COLONIAL LIFE	01/28/2019		
	0113461	2019 INSURANCE PREMIUMS_01/13/19 & 01			559.04
			Total for Check Number 16605:	0.00	559.04
16606	00788	COMCAST	01/28/2019		
	0119_1018662	INTERNET_264 ORCHARD ROAD			138.29
			Total for Check Number 16606:	0.00	138.29
16607	00788	COMCAST	01/28/2019		
	0119_1028380	INTERNET_7400 HWY 9			153.29
			Total for Check Number 16607:	0.00	153.29
16608	00788	COMCAST	01/28/2019		
	0119_1171123	INTERNET_23 SUMMIT AVE			143.29
			Total for Check Number 16608:	0.00	143.29
16609	00788	COMCAST	01/28/2019		
	0119_1236074	INTERNET_200 ANNIES WAY			174.79
			Total for Check Number 16609:	0.00	174.79
16610	00037	CO. OF SANTA CRUZ DEPT OF PUBLIC	01/28/2019		
	34840A	WOODWASTE_OPS			15.00
	34840B	WATER REBATES_ENVIR			7.50
			Total for Check Number 16610:	0.00	22.50
16611	00312	DOCTORS ON DUTY	01/28/2019		
	1010530	EMPLOYEE PHYSICAL			80.00
			Total for Check Number 16611:	0.00	80.00
16612	00118	FARMER BROTHERS COFFEE	01/28/2019		
	68729961	COFFEE SUPPLIES_ADMIN			146.88
			Total for Check Number 16612:	0.00	146.88
16613	00329	GRAINGER	01/28/2019		
	9053332418	OFFICE CUBICAL WIRING/PLUGS			351.73
	9056538300	OFFICE CUBICAL WIRING/PLUGS			54.35
			Total for Check Number 16613:	0.00	406.08
16614	00256	JESSE GUIVER	01/28/2019		
	011019_256	EMPLOYEE REIMBURSEMENT_TRAINING			105.00
			Total for Check Number 16614:	0.00	105.00
16615	00367	INFOSEND, INC	01/28/2019		
	146894A	STATEMENT POSTAGE_DECEMBER 2018			2,614.63
	146894B	MAILING FEES_DECEMBER 2018			1,100.79
	147386	PROGRAMMING_WATER & SEWER SPLIT (			350.00
			Total for Check Number 16615:	0.00	4,065.42

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
16616	00208	LEONARD KUHNLEIN	01/28/2019		
	FEB2019_208	RETIREE MEDICAL_FEB2019			125.00
			Total for Check Number 16616:	0.00	125.00
16617	00313	MET LIFE	01/28/2019		
	011419_313A	DENTAL_ADMIN			192.14
	011419_313B	DISABILITY_ADMIN			84.83
	011419_313C	LIFE INSURANCE_ADMIN			33.30
	011419_313D	DENTAL_FINANCE			1,425.60
	011419_313E	DISABILITY_FINANCE			284.18
	011419_313F	LIFE INSURANCE_FINANCE			138.19
	011419_313G	DENTAL_ENG			62.57
	011419_313H	DISABILITY_ENG			41.45
	011419_313I	LIFE INSURANCE_ENG			16.65
	011419_313J	DENTAL_OPS			1,778.27
	011419_313K	DISABILITY_OPS			310.11
	011419_313L	LIFE INSURANCE_OPS			176.49
	011419_313M	DENTAL_ENVIR			258.32
	011419_313N	DISABILITY_ENVIR			78.38
	011419_313O	LIFE INSURANCE_ENVIR			33.30
	011419_313P	DENTAL_WTP			1,247.58
	011419_313Q	DISABILITY_WTP			274.02
	011419_313R	LIFE INSURANCE_WTP			123.21
			Total for Check Number 16617:	0.00	6,558.59
16618	00662	JAMES A. MUELLER	01/28/2019		
	FEB2019_662	RETIREE MEDICAL_FEB2019			50.00
			Total for Check Number 16618:	0.00	50.00
16619	10139	NATIONAL METER & AUTOMATION	01/28/2019		
	S1109618.001A	METER 5/8" X 3/4" BADGER MODEL 25 CO!			9,015.09
	S1109618.001B	METER 1" BADGER MODEL 55 COMPLETE			742.49
			Total for Check Number 16619:	0.00	9,757.58
16620	10205	RED WING BUSINESS ADVANTAGE A(	01/28/2019		
	822-1-43668	EMPLOYEE UNIFORM_BOOTS FOR 155			210.27
	822-1-43672	EMPLOYEE UNIFORM_BOOTS			449.92
			Total for Check Number 16620:	0.00	660.19
16621	00142	SAN LORENZO LUMBER	01/28/2019		
	61-0131305	PASO FENCING REPAIR_WO#814			56.92
			Total for Check Number 16621:	0.00	56.92
16622	00125	SCARBOROUGH LUMBER	01/28/2019		
	327588	FLASHLIGHTS_WTP			79.47
	327902	LIGHTING REPAIR_ADMIN			56.19
	391633	REPLACEMENT CUT OFF SAW_OPS			1,471.46
	580003	CLEANING SUPPLIES FOR INTAKE SCREE!			27.03
	580136	TRASH BAGS_OPS			53.70
	580174	WRENCHES_GLOVES_OPS			61.30
	580182	PROJECTOR CABLE FOR BOD MEETINGS			48.32
			Total for Check Number 16622:	0.00	1,797.47
16623	00047	SOIL CONTROL LAB	01/28/2019		

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
	8120380	WATER ANALYSIS_OLY 2			39.00
	8120659	WATER ANALYSIS_OLY 2			39.00
	8120813	WATER ANALYSIS_5 LOCATIONS			145.00
	8120814	WATER ANALYSIS_OLY 3			39.00
	9010023	WATER ANALYSIS_5 LOCATIONS			145.00
			Total for Check Number 16623:	0.00	407.00
16624	00555	STORDOK, INC.	01/28/2019		
	53541165	SHREDDING SERVICES_JANUARY 2019			45.00
			Total for Check Number 16624:	0.00	45.00
16625	00369	CAROLE TRIANTAFILLOS	01/28/2019		
	FEB2019_369	RETIREE MEDICAL_FEB2019			125.00
			Total for Check Number 16625:	0.00	125.00
16626	00011	VERIZON WIRELESS	01/28/2019		
	9822233139A	CELL PHONE CHARGES_ADMIN			428.92
	9822233139B	CELL PHONE CHARGES_OPS			354.22
	9822233139C	CELL PHONE CHARGES_WTP			486.15
			Total for Check Number 16626:	0.00	1,269.29
16627	00011	VERIZON WIRELESS	01/28/2019		
	9822233140A	CELL PHONE & TABLET CHARGES_ENVIR			95.20
	9822233140B	CELL PHONE & TABLET CHARGES_OPS			204.36
	9822233140C	CELL PHONE & TABLET CHARGES_WTP			81.90
			Total for Check Number 16627:	0.00	381.46
16628	UB*00540	ANGELO VOSSOS	01/28/2019		
		Refund Check			75.00
			Total for Check Number 16628:	0.00	75.00
16629	00398	WATSONVILLE METAL CO.,INC	01/28/2019		
	8425224	OLY DUMPSTER HAUL-OUT			600.00
			Total for Check Number 16629:	0.00	600.00
16630	10152	WESTAMERICA BANK	01/28/2019		
	FEB19_10152	TRUCK LOAN_PRINCIPAL			1,879.03
	FEB2019_10152	TRUCK LOAN_INTEREST			221.65
			Total for Check Number 16630:	0.00	2,100.68
16631	UB*00541	TERRI WESTRA	01/28/2019		
		Refund Check			75.00
			Total for Check Number 16631:	0.00	75.00
16632	00729	ALPHA ANALYTICAL LABS	01/30/2019		
	9012219	LAB FEES-ANALYTICAL SERVICES			430.00
			Total for Check Number 16632:	0.00	430.00
16633	00162	ANTHEM BLUE CROSS	01/30/2019		
	68549901	RETIRED EMPLOYEE MEDICAL_02/01/19-0			325.50
			Total for Check Number 16633:	0.00	325.50

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
16634	00767	ANTHEM BLUE CROSS	01/30/2019		
	0971857061	MEDICARE RX_02/01/19-03/01/19			116.90
			Total for Check Number 16634:	0.00	116.90
16635	10113	BANK MIDWEST	01/30/2019		
	FEB2019_10113A	SOLAR LOAN_INTEREST			811.38
	FEB2019_10113B	SOLAR LOAN_PRINCIPAL			2,438.52
			Total for Check Number 16635:	0.00	3,249.90
16636	00343	ERNIE'S SERVICE CENTER	01/30/2019		
	70874_REISSUE	SERVICE/OIL/BRAKES_TRUCK #222			574.62
			Total for Check Number 16636:	0.00	574.62
16637	10069	NATE GILLESPIE	01/30/2019		
	012019_10069	EMPLOYEE REIMBURSEMENT_UNIFORM			311.81
			Total for Check Number 16637:	0.00	311.81
16638	UB*00542	JAMES LEE	01/30/2019		
		Refund Check			16.97
		Refund Check			18.23
			Total for Check Number 16638:	0.00	35.20
16639	00610	MAGGIORA BROS DRILLING	01/30/2019		
	104105	OLY WELL #2_WO#1223			7,579.84
			Total for Check Number 16639:	0.00	7,579.84
16640	10017	JEN MICHELSEN	01/30/2019		
	011619_10017	EMPLOYEE REIMBURSEMENT_MILEAGE/			30.37
			Total for Check Number 16640:	0.00	30.37
16641	00264	RAIN FOR RENT	01/30/2019		
	1302221	PASO WELL #8 DISCHARGE PUMP_WO#814			3,089.23
			Total for Check Number 16641:	0.00	3,089.23
16642	00711	ROBERTS & BRUNE CO.	01/30/2019		
	S1810260.001A	METER BOXES			3,178.93
	S1810260.001B	O.D. TAPE			34.08
			Total for Check Number 16642:	0.00	3,213.01
16643	00183	SDRMA	01/30/2019		
	65714	VEHICLE INSURANCE			332.82
			Total for Check Number 16643:	0.00	332.82
16644	00642	STEVEN M BUTLER	01/30/2019		
	STMTI2019	WATERSHED MAINTENANCE_ENVIR			3,018.90
			Total for Check Number 16644:	0.00	3,018.90
16645	10191	KEN SWEDMARK	01/30/2019		
	122619_10191	CERTIFICATIONS_T3 & D2			150.00
			Total for Check Number 16645:	0.00	150.00

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
16646	10231	TIAA COMMERCIAL FINANCE, INC.	01/30/2019		
	5905986	5 YR LEASE NEW COPIER_JANUARY 2019			252.28
			Total for Check Number 16646:	0.00	252.28
16647	10173	CARLY BLANCHARD	01/31/2019		
	013019_10173A	EMPLOYEE REIMBURSEMENT_MILEAGE			50.22
	013019_10173B	EMPLOYEE REIMBURSEMENT_MARKING			7.98
			Total for Check Number 16647:	0.00	58.20
16648	00290	CONTRACTOR COMPLIANCE & MONI	01/31/2019		
	10943	LABOR COMPLIANCE MONITORING FOR J			708.33
			Total for Check Number 16648:	0.00	708.33
16649	10189	EXPONENT, INC	01/31/2019		
	380092	SLVWD ASSESSMENT_CONJUNCTIVE USE			640.00
			Total for Check Number 16649:	0.00	640.00
16650	00750	FEDAK & BROWN, LLP	01/31/2019		
	012819_750	PROFESSIONAL SERVICES_PREPARATION			510.00
			Total for Check Number 16650:	0.00	510.00
16651	10005	ICMA RETIREMENT C/O M & T RETIRI	01/31/2019		
	86979	RETIREMENT WITHHOLDING_PP ENDING			3,374.80
			Total for Check Number 16651:	0.00	3,374.80
16652	00428	RCD OF SANTA CRUZ COUNTY	01/31/2019		
	18FLP05	FISH LADDER PERMITTING_WO#280			1,748.51
			Total for Check Number 16652:	0.00	1,748.51
16653	00125	SCARBOROUGH LUMBER	01/31/2019		
	328144	BRUSH-POLE EXTENSION_WTP			48.32
	328185	LAB SUPPLIES_WTP			79.62
	580236	CLOTH DUSTER_50' MEASURING TAP_OPS			22.53
	580374	SAW OIL_MIX_OPS			46.17
			Total for Check Number 16653:	0.00	196.64
16654	00171	SCOTTS VALLEY WATER DISTRICT	01/31/2019		
	574	WATER USE EFFICIENCY TRAINING_LODC			177.36
			Total for Check Number 16654:	0.00	177.36
16655	00399	VISION SERVICE PLAN - (CA)	01/31/2019		
	011819_399A	FEBRUARY VISION_ADMIN			28.44
	011819_399B	FEBRUARY VISION_FINANCE			156.50
	011819_399C	FEBRUARY VISION_ENG			11.14
	011819_399D	FEBRUARY VISION_OPS			333.74
	011819_399E	FEBRUARY VISION_ENVIR			38.58
	011819_399F	FEBRUARY VISION_WTP			197.78
			Total for Check Number 16655:	0.00	766.18
16656	10232	COMMUNITY FOUNDATION SANTA CI	01/31/2019		
	2A	OLYMPIA WELLFIELD HABITAT ENDOWM			20,822.48
	2B	OLYMPIA WELLFIELD HABITAT ENDOWM			40,721.55

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
			Total for Check Number 16656:	0.00	61,544.03
16657	UB*00549	WAGNER DIANA	02/06/2019		
		Refund Check			2,993.76
		Refund Check			4,288.68
			Total for Check Number 16657:	0.00	7,282.44
16658	01077	JOSEPH B BEASLEY	02/06/2019		
	122419_1077	EMPLOYEE REIMBURSEMENT_UNIFORM			39.04
			Total for Check Number 16658:	0.00	39.04
16659	00415	CA BANK & TRUST/GOV SVC DEPT_1(	02/06/2019		
	FEB2019_415	1976 SAFE DRINKING WATER BOND			15,581.43
			Total for Check Number 16659:	0.00	15,581.43
16660	00788	COMCAST	02/06/2019		
	012619_0987198	INTERNET_195 KIRBY			153.29
			Total for Check Number 16660:	0.00	153.29
16661	00058	IHWY	02/06/2019		
	12206_FEB19	BUSINESS HOSTING_FEB2019			25.00
			Total for Check Number 16661:	0.00	25.00
16662	10245	LOGMEIN USA, INC,	02/06/2019		
	191195	TELECONFERENCING_ADMIN			540.00
			Total for Check Number 16662:	0.00	540.00
16663	00102	ANDY ROBUSTELLI	02/06/2019		
	013119_102	UNIFORM REIMBURSEMENT FOR OVERCI			58.70
			Total for Check Number 16663:	0.00	58.70
16664	00125	SCARBOROUGH LUMBER	02/07/2019		
	328535	NITRILE GLOVES			17.38
	580407	POST HOLE DIGGER AND SHOVEL			68.62
	580408	SAW BLADES			19.32
	580457	DRAIN-O/LIGHT BULB			16.09
			Total for Check Number 16664:	0.00	121.41
16665	00302	POLLARDWATER.COM	02/07/2019		
	0129105.1	VALVE KEYS_OPERATIONS			312.52
	0129105.2	VALVE KEYS_WATER TREATMENT			234.39
			Total for Check Number 16665:	0.00	546.91
16666	00142	SAN LORENZO LUMBER	02/07/2019		
	61-0132666	WD-40 SPRAY LUBE			6.28
	61-0132696	SMALL SOCKET/PVC COUPLING			6.41
			Total for Check Number 16666:	0.00	12.69
16667	00760	ANGELO BARTOLOTTA	02/07/2019		
	23795	ENVELOPES_ADMIN			508.20

Check No	Vendor No / Invoice No	Vendor Name / Description	Check Date / Reference	Void Checks	Check Amount
			Total for Check Number 16667:	0.00	508.20
16668	00505	DELL MARKETING LP	02/07/2019		
	10294650994	NEW SCADA MONITORS_WO#970			740.31
			Total for Check Number 16668:	0.00	740.31
16669	00329	GRAINGER	02/07/2019		
	9070001566	SAFETY EQUIPMENT_WTP			143.54
	9070203915	SAFETY EQUIPMENT_WTP			626.86
	9072144919	SAFETY EQUIPMENT_WTP			203.95
	9074483265	SAFETY EQUIPMENT RETURN CREDIT_W			-188.64
			Total for Check Number 16669:	0.00	785.71
16670	00212	CO. OF SANTA CRUZ HEALTH SERVIC	02/07/2019		
	91114	HEALTH PERMIT LYON PLANT_WTP			1,263.00
			Total for Check Number 16670:	0.00	1,263.00
16671	00944	PDNC, INC.	02/07/2019		
	3146	MONTHLY SERVER SUPPORT_JANUARY20			517.68
	3210	MONTHLY SERVER SUPPORT_FEBRUARY2			517.68
			Total for Check Number 16671:	0.00	1,035.36
16672	00264	RAIN FOR RENT	02/07/2019		
	1306293	PASO WELL #8 DISCHARGE PIPING_WO#81			2,858.61
			Total for Check Number 16672:	0.00	2,858.61
16673	00047	SOIL CONTROL LAB	02/07/2019		
	9010739	WATER ANALYSIS_5 LOCATIONS			145.00
			Total for Check Number 16673:	0.00	145.00
16674	10243	WEST MARINE PRODUCTS, INC.	02/07/2019		
	1397	NEW SCADA MONITORS_WO#970			265.67
			Total for Check Number 16674:	0.00	265.67
			Report Total (191 checks):	0.00	360,068.62

EFT TRANSACTIONS

JANUARY 2019

13060 Highway 9
Boulder Creek, CA 95006-9119
(831) 338-2153 phone
(831) 338-7986 fax

Date	Check No	Vendor	Description		Amount
1/2/2019	EFT	PAYCHEX	ADMIN & DELIVERY FEES		216.65
1/2/2019	EFT	PAYCHEX	PAYROLL	$	105,226.28
1/16/2019	EFT	PAYCHEX	ADMIN & DELIVERY FEES	$	631.05
1/16/2019	EFT	PAYCHEX	PAYROLL	$	106,597.74
1/30/2019	EFT	PAYCHEX	ADMIN & DELIVERY FEES	$	219.50
1/30/2019	EFT	PAYCHEX	PAYROLL	$	105,829.91
1/2/2019	EFT	CALPERS	RETIREMENT BENEFITS 01/02/19	$	16,784.35
1/31/2019	EFT	CALPERS	RETIREMENT BENEFITS 01/16/19 & 01/30/19	$	35,430.35
			TOTAL EFT TRANSACTIONS	**$**	**370,935.83**

0084 A87P-7177 San Lorenzo Valley Water District

CASH REQUIREMENTS

CASH REQUIRED FOR NEGOTIABLE CHECKS &/OR ELECTRONIC FUNDS TRANSFERS (EFT) FOR CHECK DATE 01/02/19: $116,597.95

TRANSACTION SUMMARY

SUMMARY BY TRANSACTION TYPE -

TOTAL ELECTRONIC FUNDS TRANSFER (EFT)	105,226.28
TOTAL NEGOTIABLE CHECKS	11,371.67
CASH REQUIRED FOR NEGOTIABLE CHECKS &/OR EFT	**116,597.95**
TOTAL REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES	14,283.92
CASH REQUIRED FOR CHECK DATE 01/02/19	130,881.87

TRANSACTION DETAIL

ELECTRONIC FUNDS TRANSFER - *Your financial institution will initiate transfer to Paychex **at or after 12:01 A.M.** on transaction date.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		BANK DRAFT AMOUNTS & OTHER TOTALS
12/31/18	WELLS FARGO BANK, NA	xxxxxx1358	Direct Deposit	Net Pay Allocations	67,955.21	**67,955.21**
12/31/18	WELLS FARGO BANK, NA	xxxxxx1358	Taxpay®	Employee Withholdings		
				Social Security	7,411.10	
				Medicare	1,733.25	
				Fed Income Tax	12,873.25	
				CA Income Tax	4,913.78	
				CA Disability	1,195.34	
				Total Withholdings	**28,126.72**	
				Employer Liabilities		
				Social Security	7,411.10	
				Medicare	1,733.25	
				Total Liabilities	**9,144.35**	**37,271.07**
					EFT FOR 12/31/18	**105,226.28**
					TOTAL EFT	**105,226.28**

NEGOTIABLE CHECKS - *Check amounts will be debited when payees cash checks. Funds must be available on check date.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		TOTAL
01/02/19	WELLS FARGO BANK, NA	xxxxxx1358	Payroll	Check Amounts	11,371.67	
					TOTAL NEGOTIABLE CHECKS	**11,371.67**

REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES - *Paychex does not remit these funds.You must ensure accurate and timely payment of applicable items.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		TOTAL
01/02/19	Refer to your records for account Information		Payroll	Employee Deductions		
				Aflc/Col Post	55.34	
				Aflc/Col Pre	335.08	

0084 A87P-7177 San Lorenzo Valley Water District

CASH REQUIREMENTS

CASH REQUIRED FOR NEGOTIABLE CHECKS &/OR ELECTRONIC FUNDS TRANSFERS (EFT) FOR CHECK DATE 01/02/19: $116,597.95

REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES (cont.) - *Paychex does not remit these funds.You must ensure accurate and timely payment of applicable items.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		TOTAL
01/02/19	Refer to your records for account Information		Payroll	Employee Deductions **(cont.)**		
				Calper 457	1,025.00	
				DPer	7,111.88	
				Health	910.80	
				ICMA	3,374.80	
				Life Ins	14.00	
				PXDCA EE PRE	576.92	
				PXUME EE PRE	380.77	
				Union dues	499.33	
				Total Deductions	**14,283.92**	
				TOTAL REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES		**14,283.92**

PAYCHEX WILL MAKE THESE TAX DEPOSIT(S) ON YOUR BEHALF - *This information serves as a record of payment.*

DUE DATE	PRODUCT	DESCRIPTION	
01/09/19	Taxpay®	FED IT PMT Group	31,161.95
01/09/19	Taxpay®	CA IT PMT Group	6,109.12

0084 A87P-7177 San Lorenzo Valley Water District

CASH REQUIREMENTS

CASH REQUIRED FOR NEGOTIABLE CHECKS &/OR ELECTRONIC FUNDS TRANSFERS (EFT) FOR CHECK DATE 01/16/19: $116,241.66

TRANSACTION SUMMARY

SUMMARY BY TRANSACTION TYPE -

TOTAL ELECTRONIC FUNDS TRANSFER (EFT)	106,597.74
TOTAL NEGOTIABLE CHECKS	9,643.92
CASH REQUIRED FOR NEGOTIABLE CHECKS &/OR EFT	**116,241.66**
TOTAL REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES	14,721.26
CASH REQUIRED FOR CHECK DATE 01/16/19	130,962.92

TRANSACTION DETAIL

ELECTRONIC FUNDS TRANSFER - *Your financial institution will initiate transfer to Paychex **at or after 12:01 A.M.** on transaction date.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		BANK DRAFT AMOUNTS & OTHER TOTALS
01/15/19	WELLS FARGO BANK, NA	xxxxxx1358	Direct Deposit	Net Pay Allocations	69,519.47	**69,519.47**
01/15/19	WELLS FARGO BANK, NA	xxxxxx1358	Taxpay®	Employee Withholdings		
				Social Security	7,414.63	
				Medicare	1,734.03	
				Fed Income Tax	12,735.88	
				CA Income Tax	4,849.09	
				CA Disability	1,195.90	
				Total Withholdings	**27,929.53**	
				Employer Liabilities		
				Social Security	7,414.64	
				Medicare	1,734.10	
				Total Liabilities	**9,148.74**	**37,078.27**
					EFT FOR 01/15/19	**106,597.74**
					TOTAL EFT	**106,597.74**

NEGOTIABLE CHECKS - *Check amounts will be debited when payees cash checks. Funds must be available on check date.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		TOTAL
01/16/19	WELLS FARGO BANK, NA	xxxxxx1358	Payroll	Check Amounts	9,643.92	
					TOTAL NEGOTIABLE CHECKS	**9,643.92**

REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES - *Paychex does not remit these funds.You must ensure accurate and timely payment of applicable items.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		TOTAL
01/16/19	Refer to your records for account Information		Payroll	Employee Deductions		
				Advance	58.70	
				Aflc/Col Post	55.34	

0084 A87P-7177 San Lorenzo Valley Water District

CASH REQUIREMENTS

CASH REQUIRED FOR NEGOTIABLE CHECKS &/OR ELECTRONIC FUNDS TRANSFERS (EFT) FOR CHECK DATE 01/16/19: $116,241.66

REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES (cont.) - *Paychex does not remit these funds.You must ensure accurate and timely payment of applicable items.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		TOTAL
01/16/19	Refer to your records for account Information		Payroll	Employee Deductions **(cont.)**		
				Aflc/Col Pre	335.08	
				Calper 457	1,025.00	
				DPer	7,470.52	
				Health	910.80	
				ICMA	3,374.80	
				Life Ins	14.00	
				PXDCA EE PRE	576.92	
				PXUME EE PRE	400.77	
				Union dues	499.33	
				Total Deductions	**14,721.26**	
				TOTAL REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES		**14,721.26**

PAYCHEX WILL MAKE THESE TAX DEPOSIT(S) ON YOUR BEHALF - *This information serves as a record of payment.*

DUE DATE	PRODUCT	DESCRIPTION	
01/24/19	Taxpay®	FED IT PMT Group	31,033.28
01/24/19	Taxpay®	CA IT PMT Group	6,044.99

0084 A87P-7177 San Lorenzo Valley Water District

CASH REQUIREMENTS

CASH REQUIRED FOR NEGOTIABLE CHECKS &/OR ELECTRONIC FUNDS TRANSFERS (EFT) FOR CHECK DATE 01/30/19: $116,283.42

TRANSACTION SUMMARY

SUMMARY BY TRANSACTION TYPE -

TOTAL ELECTRONIC FUNDS TRANSFER (EFT)	105,829.91
TOTAL NEGOTIABLE CHECKS	10,453.51
CASH REQUIRED FOR NEGOTIABLE CHECKS &/OR EFT	**116,283.42**
TOTAL REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES	13,165.86
CASH REQUIRED FOR CHECK DATE 01/30/19	129,449.28

TRANSACTION DETAIL

ELECTRONIC FUNDS TRANSFER - *Your financial institution will initiate transfer to Paychex **at or after 12:01 A.M.** on transaction date.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		BANK DRAFT AMOUNTS & OTHER TOTALS
01/29/19	WELLS FARGO BANK, NA	xxxxxx1358	Direct Deposit	Net Pay Allocations	69,182.03	**69,182.03**
01/29/19	WELLS FARGO BANK, NA	xxxxxx1358	Taxpay®	Employee Withholdings		
				Social Security	7,399.21	
				Medicare	1,730.49	
				Fed Income Tax	12,446.01	
				CA Income Tax	4,749.09	
				CA Disability	1,193.43	
				Total Withholdings	**27,518.23**	
				Employer Liabilities		
				Social Security	7,399.21	
				Medicare	1,730.44	
				Total Liabilities	**9,129.65**	**36,647.88**
					EFT FOR 01/29/19	**105,829.91**
					TOTAL EFT	**105,829.91**

NEGOTIABLE CHECKS - *Check amounts will be debited when payees cash checks. Funds must be available on check date.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		TOTAL
01/30/19	WELLS FARGO BANK, NA	xxxxxx1358	Payroll	Check Amounts	10,453.51	
					TOTAL NEGOTIABLE CHECKS	**10,453.51**

REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES - *Paychex does not remit these funds.You must ensure accurate and timely payment of applicable items.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		TOTAL
01/30/19	Refer to your records for account Information		Payroll	Employee Deductions		
				Advance	67.82	
				Calper 457	1,025.00	

0084 A87P-7177 San Lorenzo Valley Water District

CASH REQUIREMENTS

CASH REQUIRED FOR NEGOTIABLE CHECKS &/OR ELECTRONIC FUNDS TRANSFERS (EFT) FOR CHECK DATE 01/30/19: $116,283.42

REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES (cont.) - *Paychex does not remit these funds.You must ensure accurate and timely payment of applicable items.*

TRANS. DATE	BANK NAME	ACCOUNT NUMBER	PRODUCT	DESCRIPTION		TOTAL
01/30/19	Refer to your records for account Information		Payroll	Employee Deductions **(cont.)**		
				DPer	7,641.42	
				ICMA	3,374.80	
				Life Ins	14.00	
				PXDCA EE PRE	576.92	
				PXUME EE PRE	400.77	
				Union dues	65.13	
				Total Deductions	**13,165.86**	
				TOTAL REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES		**13,165.86**

PAYCHEX WILL MAKE THESE TAX DEPOSIT(S) ON YOUR BEHALF - *This information serves as a record of payment.*

DUE DATE	PRODUCT	DESCRIPTION	
02/06/19	Taxpay®	FED IT PMT Group	30,705.36
02/06/19	Taxpay®	CA IT PMT Group	5,942.52

Fiscal Year 2018/2019
Second Quarter Financial Summary

Management's Discussion and Analysis (MDA)

Overview

This section presents management's analysis of the San Lorenzo Valley Water District's (the District) financial condition and activities as of the above mentioned period. This information should be read in conjunction with the unaudited financial information that follows. For a complete review of a fiscal year, it is best to come back and look at the audited Annual Financial Report.

The District does a hard year end close, through that process there are yearend expenses that are booked at yearend and not represented in the monthly expenses. There may also be annual expenses paid upfront that could cause individual months to appear skewed. Data is continuously being reviewed, so it is not un-common for a prior month balance to change slightly throughout the year as accounts are reconciled. It is important to understand this in connection with the numbers that follow.

Operations Net Results

For the three months ended December 30, 2018, the District had an operating income of $840K. Quarterly operating revenue was $2.6M with operating expenses of $1.8M. This brings YTD operating income to $1.6K. The first 6 months of the year typically have higher consumption and the remaining quarters have lower consumption. Consumption trends initially dipped below the prior year in Q1, but the last two months have been above the prior three year average. For the cumulative 6 months, consumption is 3% above the prior three year average. With the rate structure change, consumption plays a large part in operating revenue fluctuations. Consumption is still expected to be in line, or slightly above, the budgeted 650,000 units.

Operating Revenue

Quarterly operating revenue of $2.6M is in line with expectations. October, November and December had usage of 62.2K, 59K and 47.7K units of water billed, respectively.

Q2 CY compared to Q2 PY had an increase of $287K, this is due to Q2 CY having the new rates in effect and slightly higher consumption.

YTD (6 months) revenue of $5.2M is in line with expectations.

Operating Expenses

Quarterly operating expenses were $1.8M, or 22% of the annual budget.

Q2 CY compared to Q2 PY had an increase of $166K, or 10%. The majority of the fluctuation related to timing issues or budgeted increases. The PY had timing of a couple large bills, such as $50K health bill, that posted in January, making December look artificially low.

YTD (6 months) operating expenses of $3.6M is in line with expectations, and is 45% of the full year budget.

Non-Operating Revenue & Expenses

Below itemizes the different non-operating revenue and expenses of the District as of Q2.

Non-operating Revenue	Q1 Total	Q2 Total	YTD Total
Lease Reveue	$ 5,940	$ 5,940	$ 11,881
Property Taxes	-	393,646	393,646
Assessment Revenue	-	177,971	177,971
Rental Income	3,018	5,287	8,305
Interest	11,057	13,349	24,407
	$ 20,016	$ 596,194	$ 616,210

Non-operating Expenses	Q1 Total	Q2 Total	YTD Total
Interest Expense	$ 12,270	$ 3,993	$ 16,263

Debt Obligations

Below itemizes current debt obligations of the District as of Q2. Some of the debt obligations are solely funded from assessments and not paid out of the general fund.

	Balance 2018	Additions	Payments	Balance 2019
Felton Loan	$ 1,502,664			$ 1,502,664
Refunding Bond	1,845,823		330,857	1,514,966
Olympia SRF Loan	1,527,028			1,527,028
Other Loans	374,467		30,454	344,013
Probation Tank Loan	-	2,000,000		2,000,000
	$ 5,249,982	$ 2,000,000	$ 361,311	$ 6,888,671

Capital Projects & Expenditures

Below itemizes the Q2 capital expenditures that have been spent. Please note if any projects used in-house labor, these amounts have may not yet be allocated to the projects. In Q2 there were approximately $716K in capital expenditures, varying across the board for multiple projects. Paso Well 6 replacement (Well 8), Probation Tank, and delivery of a vehicle. This quarter also saw more expenditures for the Lompico Assessment District for engineering on the three main tanks and PRV stations.

PROJECT LISTING OF ADDITIONS TO CIP

FUND	PROJECT	FY1718 BALANCES	Q1 FY1819 ADDITIONS	Q2 FY1819 ADDITIONS	Q3 FY1819 ADDITIONS	Q4 FY1819 ADDITIONS	PROJECT TOTAL
02	BCEWW IMPROVEMENTS / CAP-1617001A	$ 62,472.12	$ 6,135.00	$ 14,645.00	$ -	$ -	$ 83,252.12
01	WO 823 - PROBATION TANK / CAP-1516002A	$ 379,230.50	$ 62,489.61	$ 100,876.65	$ -	$ -	$ 542,596.76
01	SWIM TANK DESIGN / CAP-1516003A	$ 86,439.64	$ -	$ -	$ -	$ -	$ 86,439.64
01	WO 272/549 - LYON WATER TREATMENT PLANT ACCESS RD REPAIR	$ 107,381.57	$ -	$ 5,290.56	$ -	$ -	$ 112,672.13
01	LOST ACRES WATER TANK PROJECT	$ 7,416.40	$ -	$ -	$ -	$ -	$ 7,416.40
01	WO 521 - BLUE TANK REPLACEMENT PROJECT / CAP-1718001A	$ 49,766.24	$ 9,168.00	$ 11,250.86	$ -	$ -	$ 70,185.10
01	WO 411 - FELTON METER CHANGE OUT PROJECT	$ 219,863.06	$ 11,125.46	$ 2,135.61	$ -	$ -	$ 233,124.13
01	WO 358 - COMBINE SPRINGS RAW WATER LINE	$ 95,288.66	$ 75.75	$ 9,921.07	$ -	$ -	$ 105,285.48
01	WO 550 - HIGHWAY 9/WESTERN AVE 6" MAIN REPAIR	$ 57,938.55	$ 101,883.74	$ -	$ -	$ -	$ 159,822.29
01	WO 280 - FALL CREEK INTAKE FEMA	$ 62,353.53	$ 35,861.97	$ 24,938.82	$ -	$ -	$ 123,154.32
01	WO 525 - LOMPICO SERVICE LINE REPLACEMENT	$ 24,287.87	$ 4,915.82	$ 10,387.39	$ -	$ -	$ 39,591.08
01	WO 814 - PASO WELL 6 REPLACEMENT	$ 22,950.32	$ 44,521.78	$ 391,794.95	$ -	$ -	$ 459,267.05
01	WO 815 - PASO WELL 7 REHABILITATION	$ 88,548.46	$ 26,789.58	$ 6,613.03	$ -	$ -	$ 121,951.07
01	WO 837 - MAIN PRV STATION REPLACEMENTS	$ 6,528.12	$ 2,335.00	$ 14,317.65	$ -	$ -	$ 23,180.77
01	WO 838 - MADRONE BOOSTER PRV STATION REPLACEMENT	$ -	$ -	$ -	$ -	$ -	$ -
01	WO 901 - GENERAL METER CHANGE OUTS	$ 36,432.52	$ 9,326.09	$ 22,212.32	$ -	$ -	$ 67,970.93
01	DISTRICT TWO WAY RADIO SYSTEM	$ 59,626.24	$ -	$ -	$ -	$ -	$ 59,626.24
01	WO 950 - USDA LOAN	$ 118,442.43	$ 128,093.49	$ 27,214.62	$ -	$ -	$ 273,750.54
01	NEW METER SETS	$ -	$ -	$ 605.05	$ -	$ -	$ 605.05
01	GATE OPENER - OPERATIONS BUILDING	$ -	$ 4,080.00	$ 3,500.00	$ -	$ -	$ 7,580.00
01	VEHICLE #234 - DISTRIBUTION	$ -	$ -	$ 44,498.69	$ -	$ -	$ 44,498.69
01	WO 1208 - LEWIS TANK	$ -	$ -	$ 8,688.67	$ -	$ -	$ 8,688.67
01	WO 1209 - MADRONE TANK	$ -	$ -	$ 8,688.67	$ -	$ -	$ 8,688.67
01	WO 1210 - KASKI TANK	$ -	$ -	$ 8,688.67	$ -	$ -	$ 8,688.67
01	VEHICLE #236 - WATER TREATMENT	$ -	$ -	$ -	$ -	$ -	$ -
01	VEHICLE #238 - DISTRIBUTION	$ -	$ -	$ -	$ -	$ -	$ -
01	VEHICLE #240 - FINANCE	$ -	$ -	$ -	$ -	$ -	$ -
		$ 1,484,966.23	**$ 446,801.28**	**$ 716,268.28**	**$ -**	**$ -**	**$ 2,648,035.79**

FUND 01 BEG BALANCE	$ 2,840,095.29	$ 3,280,761.57		
FUND 01 ADDITIONS	$ 440,666.28	$ 701,623.28		
FUND 01 END BALANCE	***$ 3,280,761.57***	***$ 3,982,384.85***	***$ -***	***$ -***

FUND 02 BEG BALANCE	$ 62,472.12	$ 68,607.12		
FUND 02 ADDITIONS	$ 6,135.00	$ 14,645.00		
FUND 02 END BALANCE	***$ 68,607.12***	***$ 83,252.12***	***$ -***	***$ -***

OPERATING ANALYSIS - DECEMBER 2018

REVENUE BY CATEGORY

DESCRIPTION	COMPARING AGAINST PRIOR YEAR					COMPARING AGAINST BUDGET		
	ACTUALS	% OF TOTAL	PRIOR YEAR	$ Diff.	% Diff.	Act. % of Budget	ANNUAL BUDGET	% of Annual
WATER USAGE	$ 515,103	65.9%	$ 430,207	$ 84,896	20%	8%	$ 6,846,000	68%
BASIC CHARGES	253,817	32.5%	246,501	7,316	3%	9%	2,986,000	30%
METERS, PENALTIES & OTHER	2,970	0.4%	4,655	(1,685)	-36%	3%	90,000	1%
SEWER CHARGES	10,016	1.3%	8,344	1,672	20%	10%	100,000	1%
TOTAL OPERATING REVENUE	**$ 781,906**	**100.0%**	**$ 689,707**	**$ 92,199**	**13%**	**8%**	**$ 10,022,000**	**100%**

REVENUE COMMENTS

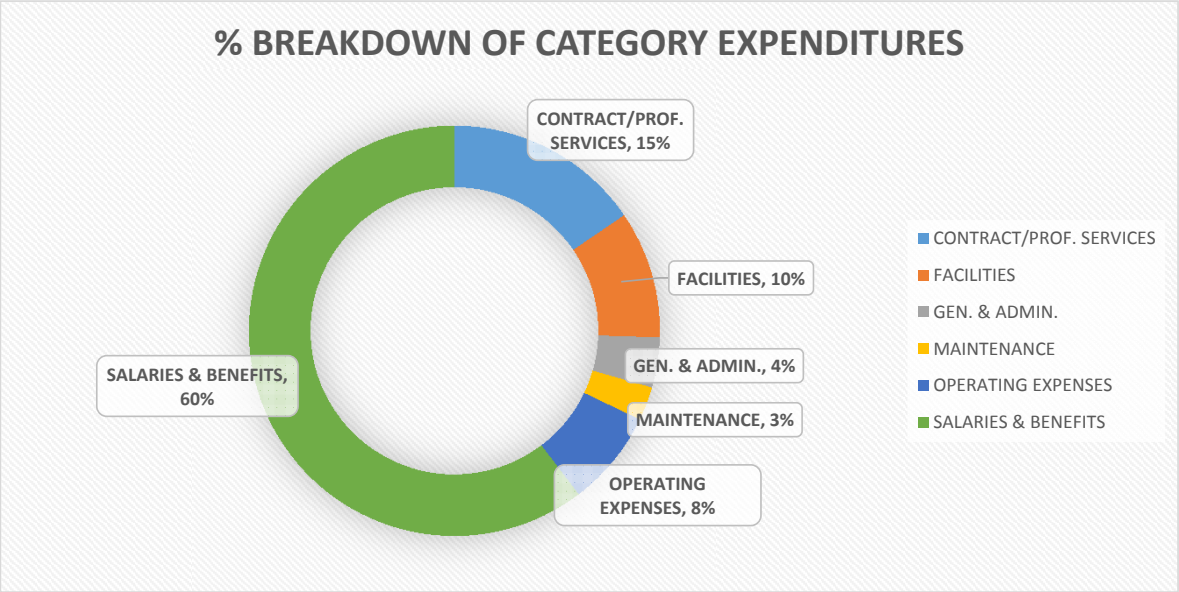
Water Usage: Dec 18 contains the new rates and had 12% higher consumption that the prior December.
Penalties/Other: Timing of tags/turn-offs due to the holidays
Sewer Charges: New rates went into effect Dec 18.

EXPENSES BY CATEGORY

DESCRIPTION	COMPARING AGAINST PRIOR YEAR					COMPARING AGAINST BUDGET		
	ACTUALS	% OF TOTAL	PRIOR YEAR	$ Diff.	% Diff.	Act. % of Budget	ANNUAL BUDGET	% of Annual
SALARIES & BENEFITS	$ 335,127	60.3%	$ 266,297	$ 68,830	26%	7%	$ 5,048,246	63%
CONTRACT/PROF. SERVICES	85,897	15.5%	62,119	23,778	38%	7%	1,316,360	17%
OPERATING EXPENSES	41,966	7.6%	16,363	25,603	156%	10%	420,500	5%
MAINTENANCE	14,728	2.7%	20,708	(5,980)	-29%	8%	184,350	2%
FACILITIES	55,790	10.0%	74,518	(18,728)	-25%	10%	571,800	7%
GEN. & ADMIN.	21,938	3.9%	27,048	(5,110)	-19%	5%	420,400	5%
TOTAL OPERATING EXPENSES	**$ 555,446**	**100%**	**$ 467,053**	**$ 88,393**	**19%**	**7%**	**$ 7,961,656**	**100%**

EXPENSE COMMENTS

Sal. & Ben.: $50K from timing of PY health bill
Prof. Serv: Prior year had low expenses due to timing
Legal Bills: Dec18 legal bills were $9.5K
Facilities: Current amount is more like the normal run rate. Prior year had timing of bills.



OPERATING ANALYSIS - Q2 FY1819 (OCT-DEC)

REVENUE BY CATEGORY

	COMPARING AGAINST PRIOR YEAR					COMPARING AGAINST BUDGET		
DESCRIPTION	**ACTUALS**	**% OF TOTAL**	**PRIOR YEAR**	***$ Diff.***	***% Diff.***	**Act. % of Budget**	**ANNUAL BUDGET**	***% of Annual***
WATER USAGE	$ 1,796,922	*69.3%*	$ 1,496,071	*$ 300,851*	*20%*	*26%*	$ 6,846,000	*68%*
BASIC CHARGES	752,628	*29.0%*	767,551	*(14,924)*	*-2%*	*25%*	2,986,000	*30%*
METERS, PENALTIES & OTHER	16,675	*0.6%*	16,857	*(182)*	*-1%*	*19%*	90,000	*1%*
SEWER CHARGES	26,704	*1.0%*	25,032	*1,672*	*7%*	*27%*	100,000	*1%*
TOTAL OPERATING REVENUE	**$ 2,592,929**	***100.0%***	**$ 2,305,512**	***$ 287,417***	***12%***	***26%***	**$ 10,022,000**	***100%***

REVENUE COMMENTS

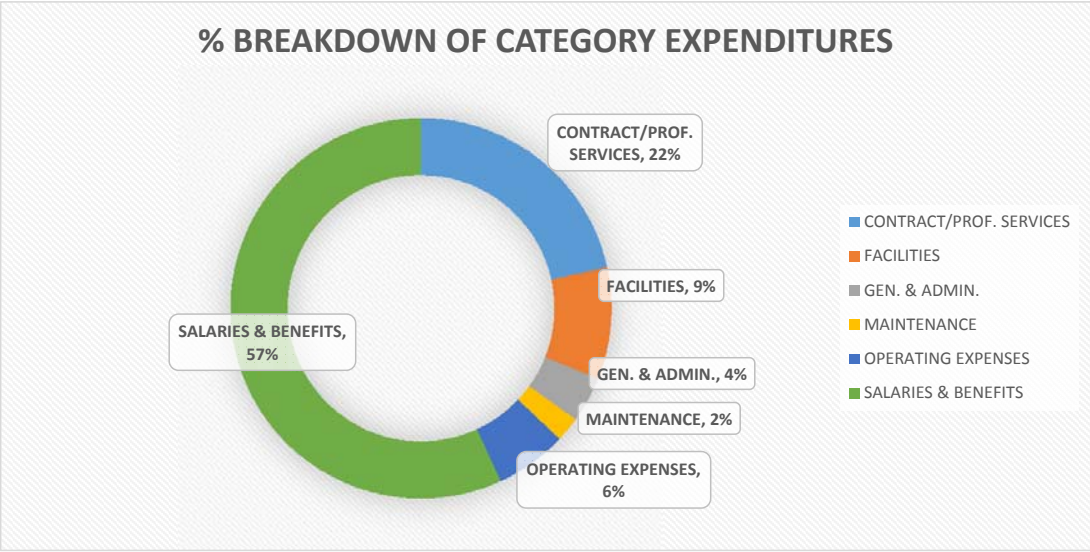
Water Usage: Part of Q2 FY1819 has the new rate increase, as well as consumption for Q2 FY1819 was 9% higher than Q2 FY1718.
Sewer Charges: New rates went into effect for December billings.

EXPENSES BY CATEGORY

	COMPARING AGAINST PRIOR YEAR					COMPARING AGAINST BUDGET		
DESCRIPTION	**ACTUALS**	**% OF TOTAL**	**PRIOR YEAR**	***$ Diff.***	***% Diff.***	**Act. % of Budget**	**ANNUAL BUDGET**	***% of Annual***
SALARIES & BENEFITS	$ 996,854	*56.9%*	$ 886,159	*$ 110,695*	*12%*	*20%*	$ 5,048,246	*63%*
CONTRACT/PROF. SERVICES	377,699	*21.5%*	357,470	*20,229*	*6%*	*29%*	1,316,360	*17%*
OPERATING EXPENSES	106,588	*6.1%*	72,346	*34,243*	*47%*	*25%*	420,500	*5%*
MAINTENANCE	36,924	*2.1%*	50,103	*(13,179)*	*-26%*	*20%*	184,350	*2%*
FACILITIES	165,856	*9.5%*	148,159	*17,697*	*12%*	*29%*	571,800	*7%*
GEN. & ADMIN.	68,807	*3.9%*	72,297	*(3,491)*	*-5%*	*16%*	420,400	*5%*
TOTAL OPERATING EXPENSES	**$ 1,752,727**	***100%***	**$ 1,586,534**	**$ 166,194**	***10%***	***22%***	**$ 7,961,656**	***100%***

EXPENSE COMMENTS

Salaries/Benefits: PY looks $50K light from health bill hitting in January, $10K for new hire in FY1819, $35K from expected budgeted increases.
Operating Expenses: PY December had timing issues making it appear low, catches up in January.



OPERATING ANALYSIS - YTD FY1819 (JULY-DEC)

REVENUE BY CATEGORY

	COMPARING AGAINST PRIOR YEAR					COMPARING AGAINST BUDGET		
DESCRIPTION	**ACTUALS**	**% OF TOTAL**	**PRIOR YEAR**	***$ Diff.***	***% Diff.***	**Act. % of Budget**	**ANNUAL BUDGET**	***% of Annual***
WATER USAGE	$ 3,639,695	*70.1%*	$ 2,579,387	*$ 1,060,308*	*41%*	*53%*	$ 6,846,000	*68%*
BASIC CHARGES	1,464,069	*28.2%*	1,667,732	*(203,663)*	*-12%*	*49%*	2,986,000	*30%*
METERS, PENALTIES & OTHER	38,445	*0.7%*	47,524	*(9,079)*	*-19%*	*43%*	90,000	*1%*
SEWER CHARGES	51,738	*1.0%*	50,068	*1,670*	*3%*	*52%*	100,000	*1%*
TOTAL OPERATING REVENUE	**$ 5,193,946**	***100.0%***	**$ 4,344,711**	***$ 849,235***	***20%***	***52%***	**$ 10,022,000**	***100%***

REVENUE COMMENTS

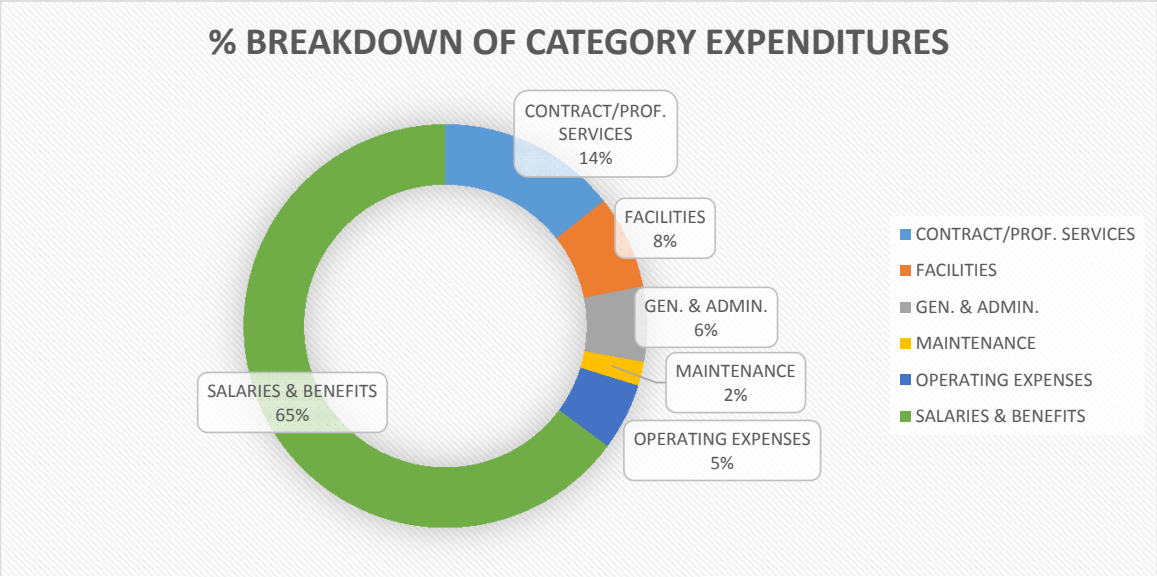
YTD revenues are higher due to the rate increase that went into effect until Nov 2018, along with YTD consumption being 3% higher than prior year

EXPENSES BY CATEGORY

	COMPARING AGAINST PRIOR YEAR					COMPARING AGAINST BUDGET		
DESCRIPTION	**ACTUALS**	**% OF TOTAL**	**PRIOR YEAR**	***$ Diff.***	***% Diff.***	**Act. % of Budget**	**ANNUAL BUDGET**	***% of Annual***
SALARIES & BENEFITS	$ 2,342,564	*65.0%*	$ 2,120,252	*$ 222,313*	*10%*	*46%*	$ 5,048,246	*63%*
CONTRACT/PROF. SERVICES	513,177	*14.2%*	584,978	*(71,801)*	*-12%*	*39%*	1,316,360	*17%*
OPERATING EXPENSES	193,944	*5.4%*	140,632	*53,312*	*38%*	*46%*	420,500	*5%*
MAINTENANCE	68,875	*1.9%*	80,806	*(11,931)*	*-15%*	*37%*	184,350	*2%*
FACILITIES	269,660	*7.5%*	270,322	*(662)*	*0%*	*47%*	571,800	*7%*
GEN. & ADMIN.	218,080	*6.0%*	211,253	*6,827*	*3%*	*52%*	420,400	*5%*
TOTAL OPERATING EXPENSES	**$ 3,606,301**	***100%***	**$ 3,408,243**	**$ 198,058**	***6%***	***45%***	**$ 7,961,656**	***100%***

EXPENSE COMMENTS

For the most part, expenses are tracking similar to the prior year, outside of budgeted increases. $50K of payroll was related to employee final paychecks.



OPERATING ANALYSIS - YTD TREND FY1819

REVENUE BY CATEGORY

DESCRIPTION	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YTD	BUDGET	% OF BUD.
WATER USAGE	359,119	777,219	706,435	645,508	636,311	515,103	3,639,695	6,846,000	53%
BASIC CHARGES	237,313	237,200	236,928	245,212	253,599	253,817	1,464,069	2,986,000	49%
METERS, PENALTIES & OTHER	5,250	9,855	6,665	6,135	7,570	2,970	38,445	90,000	43%
SEWER CHARGES	8,344	8,345	8,344	8,344	8,344	10,016	51,738	100,000	52%
TOTAL OPERATING REVENUE	**610,027**	**1,032,619**	**958,372**	**905,199**	**905,824**	**781,906**	**5,193,946**	**10,022,000**	**52%**

EXPENSES BY CATEGORY

DESCRIPTION	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YTD	BUDGET	% OF BUD.
SALARY & BENEFITS	514,027	510,140	321,543	327,440	334,286	335,127	2,342,564	5,048,246	46%
CONTRACT/PROF. SERVICES	5,572	48,144	81,763	220,894	70,907	85,897	513,177	1,316,360	39%
OPERATING EXPENSES	11,986	33,476	41,893	32,378	32,244	41,966	193,944	420,500	46%
MAINTENANCE	3,079	10,102	18,770	11,277	10,919	14,728	68,875	184,350	37%
FACILITIES	11,383	31,020	61,400	58,815	51,252	55,790	269,660	571,800	47%
GEN. & ADMIN.	101,568	16,460	31,246	25,456	21,413	21,938	218,080	420,400	52%
TOTAL OPERATING EXPENSES	**647,615**	**649,343**	**556,615**	**676,260**	**521,021**	**555,446**	**3,606,301**	**7,961,656**	**45%**
OPERATING INCOME (LOSS)	**(37,589)**	**383,276**	**401,756**	**228,939**	**384,802**	**226,460**	**1,587,645**	**2,060,344**	**77%**

COMMENTS

REVENUE/EXPENSES:

Current year to date revenue and expenses are tracking as expected overall. 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.

OPERATING EXPENSE ANALYSIS - Q2

DETAILED EXPENSES BY DEPARTMENT

ADMINISTRATIVE	Q2 CY ACTUALS	Q2 % of Budget	YTD ACTUALS	YTD % of Budget	ANNUAL BUDGET	Notes
SALARIES & BENEFITS	$ 38,690	9%	$ 179,811	40%	$ 450,812	
CONTRACT/PROFESSIONAL SERVICES	$ 190,729	36%	$ 209,155	39%	$ 534,000	
OPERATING EXPENSES	$ 1,043	105%	$ 1,043	105%	$ 993	New copier, YE total expected to be $4K. Board meeting rental fees also hit here.
MAINTENANCE	$ 3,519	22%	$ 6,611	42%	$ 15,887	
FACILITIES	$ 6,386	25%	$ 11,752	46%	$ 25,817	
GEN. & ADMIN.	$ 22,790	13%	$ 133,039	79%	$ 169,471	Full year of insurance, OK
DEPRECIATION	$ -	0%	$ -	0%	$ -	
CAPITALIZED OVERHEAD	$ -	0%	$ -	0%	$ -	
TOTAL ADMINISTRATIVE	**$ 263,156**	**22%**	**$ 541,410**	**45%**	**$ 1,196,980**	

FINANCE	Q2 CY ACTUALS	Q2 % of Budget	YTD ACTUALS	YTD % of Budget	ANNUAL BUDGET	Notes
SALARIES & BENEFITS	$ 229,219	21%	$ 496,197	46%	$ 1,075,259	
CONTRACT/PROFESSIONAL SERVICES	$ 35,801	34%	$ 49,863	47%	$ 105,253	
OPERATING EXPENSES	$ 582	59%	$ 614	62%	$ 993	
MAINTENANCE	$ 4,649	36%	$ 6,962	55%	$ 12,759	
FACILITIES	$ -	0%	$ -	0%	$ -	
GEN. & ADMIN.	$ 38,286	24%	$ 72,309	45%	$ 159,667	
DEPRECIATION	$ -	0%	$ -	0%	$ -	
TOTAL FINANCE	**$ 308,537**	**23%**	**$ 625,946**	**46%**	**$ 1,353,931**	

ENGINEERING	Q2 CY ACTUALS	Q2 % of Budget	YTD ACTUALS	YTD % of Budget	ANNUAL BUDGET	Notes
SALARIES & BENEFITS	$ 24,475	10%	$ 48,083	20%	$ 246,165	Savings from budgeted position not yet hired
CONTRACT/PROFESSIONAL SERVICES	$ 425	3%	$ 2,882	19%	$ 15,000	
OPERATING EXPENSES	$ -	0%	$ -	0%	$ -	
MAINTENANCE	$ -	0%	$ -	0%	$ -	
FACILITIES	$ -	0%	$ 190	16%	$ 1,200	
GEN. & ADMIN.	$ 538	8%	$ 641	10%	$ 6,500	
DEPRECIATION	$ -	0%	$ -	0%	$ -	
TOTAL ENGINEERING	**$ 25,438**	**9%**	**$ 51,796**	**19%**	**$ 268,865**	

DISTRIBUTION	Q2 CY ACTUALS	Q2 % of Budget	YTD ACTUALS	YTD % of Budget	ANNUAL BUDGET	Notes
SALARIES & BENEFITS	$ 330,453	22%	$ 782,749	51%	$ 1,529,876	
CONTRACT/PROFESSIONAL SERVICES	$ 36,815	26%	$ 49,031	35%	$ 142,000	
OPERATING EXPENSES	$ 51,723	28%	$ 93,085	50%	$ 187,000	
MAINTENANCE	$ 17,197	16%	$ 37,373	34%	$ 108,728	
FACILITIES	$ 56,535	30%	$ 97,806	51%	$ 191,387	
GEN. & ADMIN.	$ 1,822	19%	$ 3,140	33%	$ 9,433	
DEPRECIATION	$ -	0%	$ -	0%	$ -	
TOTAL DISTRIBUTION	**$ 494,545**	**23%**	**$ 1,063,185**	**49%**	**$ 2,168,424**	

WATERSHED	Q2 CY ACTUALS	Q2 % of Budget	YTD ACTUALS	YTD % of Budget	ANNUAL BUDGET	Notes
SALARIES & BENEFITS	$ 63,929	24%	$ 132,375	50%	$ 264,605	
CONTRACT/PROFESSIONAL SERVICES	$ 73,271	27%	$ 121,650	44%	$ 275,360	
OPERATING EXPENSES	$ 721	16%	$ 861	19%	$ 4,500	
MAINTENANCE	$ -	0%	$ -	0%	$ 10,000	
FACILITIES	$ 826	138%	$ 1,112	185%	$ 600	Will be over due to conference calls
GEN. & ADMIN.	$ 3,694	6%	$ 6,605	10%	$ 65,600	
TOTAL WATERSHED	**$ 142,441**	**23%**	**$ 262,602**	**42%**	**$ 620,665**	

DETAILED EXPENSES BY DEPARTMENT *(continued)*

SUPPLY & TREATMENT	Q2 CY ACTUALS	Q2 % of Budget	YTD ACTUALS	YTD % of Budget	ANNUAL BUDGET	Notes
SALARIES & BENEFITS	$ 299,543	21%	$ 687,065	48%	$ 1,438,509	
CONTRACT/PROFESSIONAL SERVICES	$ 35,337	20%	$ 67,053	37%	$ 180,000	
OPERATING EXPENSES	$ 43,865	22%	$ 85,324	42%	$ 204,000	
MAINTENANCE	$ 11,559	33%	$ 17,929	52%	$ 34,753	
FACILITIES	$ 100,324	29%	$ 154,929	45%	$ 341,669	
GEN. & ADMIN.	$ 1,677	21%	$ 2,346	30%	$ 7,944	
DEPRECIATION	$ -	0%	$ -	0%	$ -	
TOTAL SUPPLY & TREATMENT	**$ 492,306**	**22%**	**$ 1,014,647**	**46%**	**$ 2,206,874**	

WASTEWATER	Q2 CY ACTUALS	Q2 % of Budget	YTD ACTUALS	YTD % of Budget	ANNUAL BUDGET	Notes
SALARIES & BENEFITS	$ 10,544	25%	$ 16,283	38%	$ 43,020	
CONTRACT/PROFESSIONAL SERVICES	$ 5,320	8%	$ 13,543	21%	$ 64,747	
OPERATING EXPENSES	$ 8,655	38%	$ 13,018	57%	$ 23,014	
MAINTENANCE	$ -	0%	$ -	0%	$ 2,222	
FACILITIES	$ 1,785	16%	$ 3,871	35%	$ 11,128	
GEN. & ADMIN.	$ -	0%	$ -	0%	$ 1,785	
DEPRECIATION	$ -	0%	$ -	0%	$ -	
TOTAL WASTEWATER	**$ 26,304**	**18%**	**$ 46,714**	**32%**	**$ 145,917**	Indirect allocations occur annually
TOTAL OPERATING EXPENSES	**$ 1,752,727**	**22%**	**$ 3,606,301**	**45%**	**$ 7,961,656**	

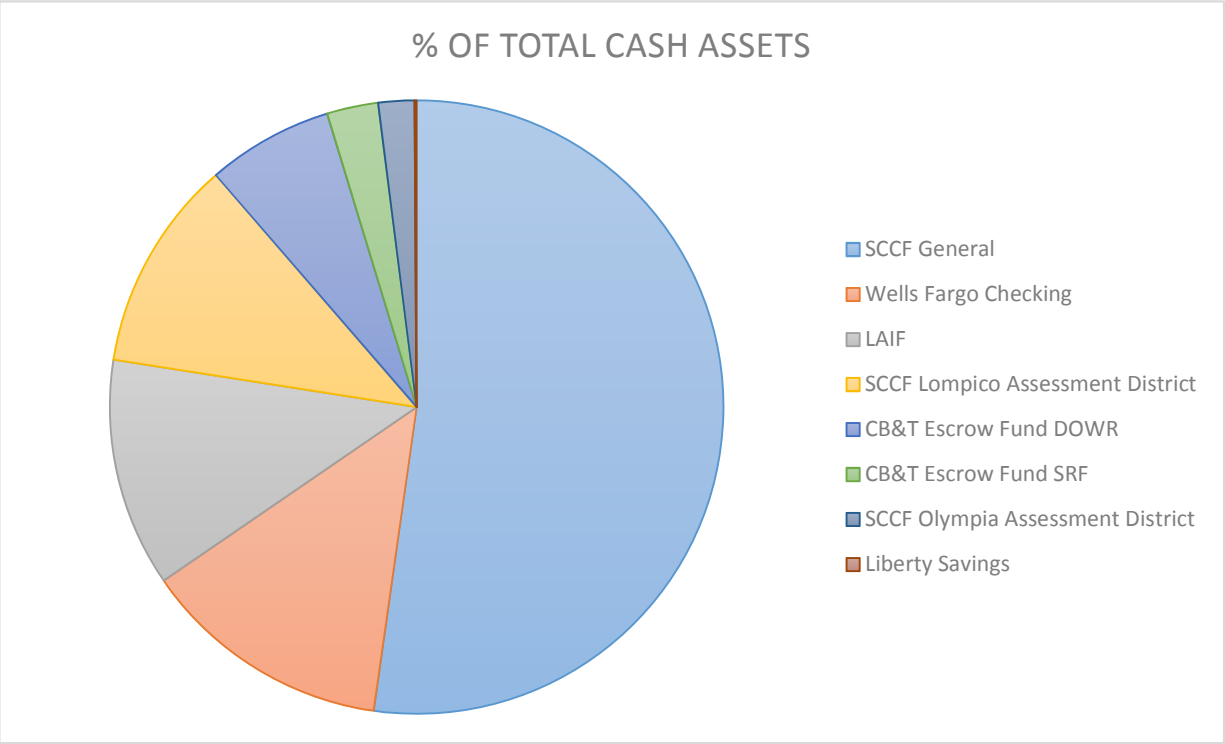
PRO FORMA FOR AUDIT:

OVERHEAD ABSORBTION [1]	$ (27,676.44)	$ (68,929.22)

[1] Overhead absorbtion are the direct and indirect capitalized costs associated with an asset the District did internally. For example, a capital pipeline project was constructed by District staff and materials versus hiring an outside contractor. These amounts are not budgeted for, therefore, are not included in the main analysis above. These will show up as a favorable off-set for operating expenses in the audit.

CASH BALANCES AS OF 12/31/2018

OPERATING ACCOUNTS	CASH BALANCE	*Ave Interest Rate*	
Wells Fargo Checking	$ 551,296	*0.35%*	
Liberty Savings	$ 4,513	*0.10%*	
LAIF	$ 503,460	*2.29%*	
SCCF General	$ 2,182,738	*1.99%*	
OPERATING BALANCE	**$ 3,242,006**		
RESTRICTED ACCOUNTS			
SCCF Lompico Assessment District	$ 466,684	*1.99%*	*For AD Projects*
SCCF Olympia Assessment District	$ 79,304	*1.99%*	*For Debt Repayment*
SCCF Probation Tank Loan Proceeds	$ 1,838,819	*1.99%*	*Loan Proceeds*
CB&T Escrow Fund SRF	$ 113,141	*0.02%*	*For Debt Repayment*
CB&T Escrow Fund DOWR	$ 277,677	*0.02%*	*For Debt Repayment*
RESTRICTED BALANCE	**$ 2,775,625**		



Local Agency Investment Fund
P.O. Box 942809
Sacramento, CA 94209-0001
(916) 653-3001

www.treasurer.ca.gov/pmia-laif/laif.asp
February 06, 2019

SAN LORENZO VALLEY WATER DISTRICT

DISTRICT MANAGER
13060 HIGHWAY 9
BOULDER CREEK, CA 95006

PMIA Average Monthly Yields

Tran Type Definitions

December 2018 Statement

Account Summary

Total Deposit:	0.00	Beginning Balance:	503,459.52
Total Withdrawal:	0.00	Ending Balance:	503,459.52

G/L Balances

Criteria: As Of = 12/31/2018; Fund = 76644, 76530

G/L Account	Title	Beginning Balance	Year-To-Date Debits	Year-To-Date Credits	End Balance
Fund 76530 -- SLV- EFF 6/2/16					
101	EQUITY IN POOLED CASH	450,344.24	200,336.64	(24,337.59)	626,343.29
240	STALE DATED WARRANTS LIABILITY	(1,363.90)	0.00	0.00	(1,363.90)
344	FUND BALANCE	(448,980.34)	24,337.59	(200,336.64)	(624,979.39)
Total Fund 76530		0.00	224,674.23	(224,674.23)	0.00
Fund 76644 -- SAN LORENZO VALLEY WATER TRUST					
101	EQUITY IN POOLED CASH	2,019,013.79	2,448,816.21	(526,628.06)	3,941,201.94
201	VOUCHERS PAYABLE (VENDOR)	0.00	500,000.00	(500,000.00)	0.00
344	FUND BALANCE	(2,019,013.79)	526,628.06	(2,448,816.21)	(3,941,201.94)
Total Fund 76644		0.00	3,475,444.27	(3,475,444.27)	0.00

REVENUE STABILIZATION RATE ANALYSIS FY1819

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**
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	**636,340**
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	**654,889**
FY1718	81,254	78,331	76,259	65,658	58,601	42,693	48,947	40,431	42,401	41,263	52,088	69,321	**697,247**
3 YR AVERAGE (BASELINE)	**74,077**	**72,235**	**72,564**	**61,733**	**50,072**	**43,388**	**46,124**	**38,463**	**42,002**	**42,438**	**51,116**	**68,613**	**662,826**
ACTUAL FY1819 CONSUMPTION													
FY1819	69,843	76,594	70,487	62,230	58,962	47,684							**385,800**
CUMULATIVE ANALYSIS													
% Above or Below Average	*-6%*	*6%*	*-3%*	*1%*	*18%*	*10%*							
Cumulative %	***-6%***	***0%***	***-1%***	***-1%***	***2%***	***3%***							

NOTES:

Consumption is cumulatively slightly above the prior three year average baseline. As of December 2018 consumption, the cumulative consumption is 3% above the baseline. There are no triggers identified per the revenue stabilization rate policy.

Utility Billing

Transactions by Date

LEAK ADJUSTMENT - Q2 2019

San Lorenzo Valley WATER DISTRICT
13060 Highway 9
Boulder Creek, CA 95006-9119
(831) 338-2153 phone
(831) 338-7986 fax

Date Range: From: 10/01/2018 To: 12/31/2018
Batch Type: Adj & Fees
Billing Cycle: 001, 002, 999

Account No	Journal Entry Date	Amount Credited	Units Above Average	Consumption Billed	Units Used	Cause of Leak	How Leak Was Detected
014245-000	10/16/2018	$ (263.12)	52	$ 607.20	60	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
010527-000	10/16/2018	$ (369.38)	73	$ 819.72	81	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
010827-000	10/16/2018	$ (961.40)	190	$ 2,069.48	204	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
005335-000	10/22/2018	$ (156.86)	31	$ 455.40	45	TOILET LEAK	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
014850-000	10/22/2018	$ (328.90)	65	$ 868.14	83	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
006869-000	10/22/2018	$ (75.90)	15	$ 182.16	18	DRIP SYSTEM LEAK	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
005612-000	10/22/2018	$ (111.32)	22	$ 283.36	28	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
006327-000	10/26/2018	$ (177.10)	35	$ 424.98	43	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
014446-000	11/6/2018	$ (182.16)	36	$ 532.62	48	TOILET LEAK	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
015050-000	11/6/2018	$ (116.38)	23	$ 263.12	26	TOILET LEAK	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
005580-000	11/14/2018	$ (151.80)	30	$ 526.24	52	DRIP SYSTEM LEAK	CUSTOMER FOUND LEAK
012445-000	11/14/2018	$ (80.96)	16	$ 303.60	30	DRIP SYSTEM LEAK	CUSTOMER FOUND LEAK
010232-000	11/14/2018	$ (242.88)	48	$ 850.08	84	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
008517-000	11/14/2018	$ (96.14)	19	$ 202.40	20	WATER LEFT ON	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
008660-000	11/20/2018	$ (80.96)	16	$ 210.43	18	LEAK ON SERVICE LINE	CUSTOMER FOUND LEAK
015263-000	11/26/2018	$ (165.38)	31	$ 435.51	41	TOILET LEAK	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
014982-000	11/30/2018	$ (323.84)	64	$ 829.84	82	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
015480-000	11/30/2018	$ (101.20)	20	$ 253.00	25	TOILET LEAK	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
008039-000	11/30/2018	$ (253.00)	50	$ 586.96	58	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
013532-000	12/3/2018	$ (189.53)	35	$ 569.49	49	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
012803-000	12/12/2018	$ (64.98)	12	$ 184.11	17	CUSTOMER LEFT HOSE ON	CUSTOMER FOUND LEAK
012400-000	12/12/2018	$ (354.20)	70	$ 323.96	85	LEAK IN CUSTOMERS DRIP SYSTEM	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
009928-000	12/20/2018	$ (314.07)	58	$ 712.53	63	DRIP SYSTEM LEAK	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
011850-000	12/20/2018	$ (192.28)	38	$ 663.74	60	DRIP SYSTEM LEAK	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE
007091-000	12/20/2018	$ (326.52)	60	$ 778.51	66.3	LEAK ON SERVICE LINE	SLVWD INFORMED CUSTOMER AFTER METER READING CAME BACK WITH HIGH USAGE

LEAK Totals **$ (5,680.26)**
 # Leak Adj **25**

FY 1819 YTD Totals **$ (15,627.95)**
 # Leak Adj **55**

In accordance with District Rules & Regulations, authorizing water bill adjustments, District staff has adjusted the above accounts for the period stated above.

MEMO

TO: District Manager

FROM: Director of Operations

SUBJECT: OPERATIONS DEPARTMENT STATUS REPORT
January 2019

DATE: February 21, 2019

RECOMMENDATION:

It is recommended that the District Manager review and file the Operations Department Project Status Report for the month of January 2019.

BACKGROUND:

BLUE TANK REPLACEMENT

The bid was awarded to Don Chapin Company for the concrete slab enhancement plans. Submittals and pre-construction meeting were completed in January 2019. Construction is set to begin once weather permits in February. Following the concrete slab enhancements, Superior Tank Company will move in to erect the new tank on the existing improved concrete slab.

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 is continuing with great success the Felton Water System Meter Replacement Project. Domestic water meters are being replaced as existing meters have 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.

PASO WELL #8

The new Paso Well #8 construction continues. Title 22 and bacteriological sample reports were received and forwarded to the State Water Resources Control Board for the water quality of the Well. It has been determined that the Well is over the MCL for arsenic and a blending scheme is being put together for approval from the State Water Resources Control Board. This is not uncommon for this Well field. Well head design is put together and being reviewed by District staff to submit to the State Water Resources Control Board approval.

Paso Well #8 is a replacement to Paso Well #6 that began splitting in its casing in 2015, which was allowing sand to overcome the pump and motor. Many attempts to fix and seal the casing on the Well were unsuccessful leading to full replacement of the Well.

PASO WELL #5A

The District received multiple calls in the Scott's Valley area of brown and dirty water in December 2018. The water quality group found that Paso Well #5A was pumping sand and gravel. The Well was pulled and video of the Well was taken. There was an area found in the screens where there was sand and gravel coming through the gravel pack and screen. It is undetermined what caused the sand and smaller gravel to begin to come through the gravel pack and screens, could have been ground movement or the pump and motor hitting the side of the Well column during a start or stop. Water jetting and swabbing to clean the screens and gravel pack has been in process. The District is looking at the end of February 2019 completion with the Well back in full operation.

SCADA (Supervisory control and data acquisition) UPGRADE

In January 2019 there was a great amount of progress on the SCADA upgrade. The District received the last pieces of hardware for the upgrade. The project is proceeding forward and the District staff in anxious and looking forward to the system upgrade being complete.

The District is about 90% done with conversion of the new SCADA and HMI system. The conversion that is done is operational and live. Our equipment and software are out of date and have been crashing needing restarting and rebooting several times a month, leading to this upgrade. District staff has been working with an outside contractor that was contracted to do the upgrade and replacement.

MAINTENANCE ISSUES

Service Line Replacement Lompico

Service Line Replacement:
10641 Visitar St.
11844 Sunset Ct.
10926 Sequoia Ave.

Main Line Repairs

6 inch main line repairs 8255 Oak Ave.

System Wide

Installed new break away hydrant check valve and fire hydrant at the corner of Hwy 9 and Scenic way, due to a vehicle accident.
2 service upgrades to 1" meters, for fire flow.
Full service line replacement 13515 West Park Ave.
Abandoned and old 2" cla-val and piping in a customers driveway that was

no longer in use.
17+ Mainline/Service Line Leaks Were Repaired.
Water shed road maintenance with certified forester Steve Butler.

Dead Meter Change Out
Boulder Creek
Ben Lomond
Scotts Valley

James Furtado

Director of Operations

SAN LORENZO VALLEY WATER DISTRICT
PRODUCTION COMPARRISON

Source	January-19	December-18	January-13	Difference This Year To 2013
North System				
Surface Water Sources				
Foreman Creek	21,642,353	5,241,092	15,866,000	
Peavine Creek + Hydro	775,923	1,053,582	9,002,000	
Clear Creek	5,526,422	8,662,396	4,965,000	
Sweetwater Creek	3,681,302	5,774,930	3,310,000	
Sub-Total (Streams)	**31,626,000**	**20,732,000**	**33,143,000**	-4.58%
Wells (North)				
Olympia No. 2	1,289,000	3,326,000	0	
Olympia No. 3	329,000	2,899,000	0	
Quail Well No. 4-A	690,000	4,378,000	0	
Quail Well No. 5-A	240,200	4,118,000	3,800	
Sub Total North Wells	**2,548,200**	**14,721,000**	**3,800**	66957.89%
South System Wells				
Pasatiempo 5A	-	13,023,100	N/A	
Pasatiempo 6	-	-	4,357,000	
Pasatiempo 7	1,508,000	4,725,000	1,644,000	
Sub Total Pasatiempo Wells	**1,508,000**	**17,748,100**	**6,001,000**	-74.87%
North South All Sources Combined	**35,682,200**	**53,201,100**	**39,147,800**	-8.85%
Felton System - Surface Water				
Fall Creek	4,606,162	5,498,714	3,873,810	
Bennett Spring	2,083,180	1,885,708	3,651,200	
Bull 1 & 2	1,274,592	1,184,832	4,487,200	
Total Felton System Sources	**7,963,934**	**8,569,254**	**12,012,210**	-33.70%
Manana Woods System				
Well 1	-	-	106,775	
Total Manana Woods Sources	**-**	**-**	**106,775**	
Sub - Total Production				
North / Felton / Manana	43,646,134	61,770,354	51,266,785	-14.86%
Surface	39,589,934	29,301,254	45,155,210	-12.32%
Wells	4,056,200	32,469,100	6,111,575	-33.63%
Total Surface Water Percentage	90.71	47.44	88.08	2.98%
Total Wells Percentage	9.29	52.56	11.92	-22.04%

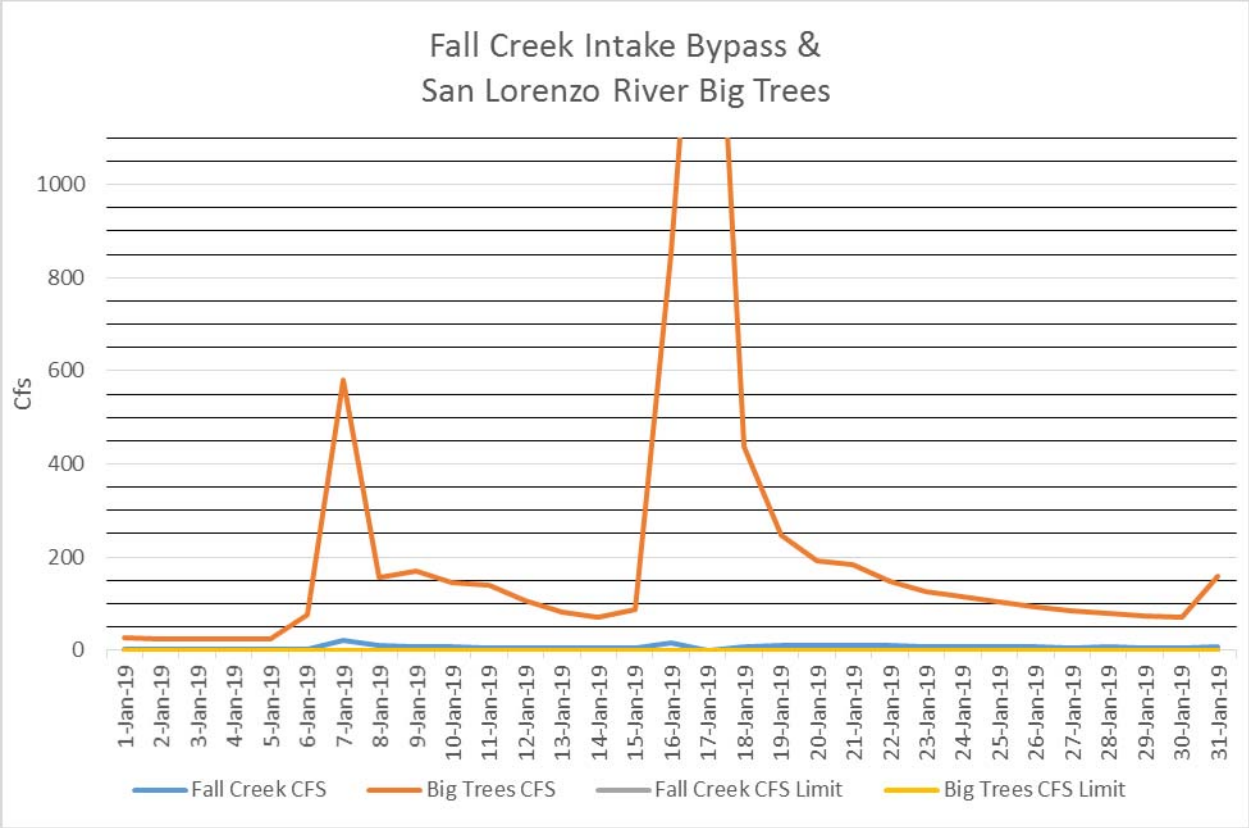
SAN LORENZO VALLEY WATER DISTRICT
PRODUCTION BY SYSTEM
+/- INTERTIES
January 2019

North System All Sources	**35,682,200**
Interties IN +	**6,591,170**
Interties OUT -	**8,150,198**
TOTAL NORHT SYSTEM	**34,123,172**
Felton Water system All Sources	**7,963,934**
Interties IN +	**68,830**
Interties OUT -	**4,206,957**
TOTAL FELTON SYSTEM	**3,825,807**
Manana Woods System	
Manana Woods Well 1	**0**
Interties IN +	**402,816**
TOTAL MANANA WOODS	**402,816**

SAN LORENZO VALLEY WATER DISTRICT
INTERTIE USAGE
January 2019

INTERTIE 2	
SLVWD to SVWD	**0**
SVWD to SLVWD	**0**
INTERTIE 3	
SLV SOUTH to SLV NORTH	**2,384,213**
SLV NORTH to SLV SOUTH	**6,123,882**
INTERTIE 4	
SLVWD to MHWD	**0**
MHWD to SLVWD	**0**
INTERTIE 6	
SLV NORTH to SLV FELTON	**68,830**
SLV FELTON to SLV NORTH	**4,206,957**
LOMPICO INTERTIE	
SLV NORTH to LOMPICO	**1,957,486**
MANANA WOODS INTERTIE	
SLVWD to MANANA WOODS	**-**

Fall Creek Intake January 2019



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 January 2019

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

Month:	January	Year:	2019	Big Trees > 26,500 Acre-ft Oct-Feb Normal Yr ☐	Big Trees <26,500 Acre-ft Oct-Feb Dry Yr X

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 Apil 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	9:45	JG	2	116	25.0		2.014	25.5	0	Yes	Yes	
2	10:35	KS	2	102	25.0		1.994	25.0	0	Yes	Yes	
3	9:50	JG	2	137	25.0		1.877	24.5	0	Yes	Yes	
4	8:50	JG	2	106	25.0		1.945	24.5	0	Yes	Yes	
5	7:00	HO	2	110	25.0		1.935	24.5	1.18	Yes	Yes	
6	7:55	HO	2	108	25.0		2.639	77.3	4.70	Yes	Yes	
7	9:20	JG	2	106	25.0		22.40	580	0.10	Yes	Yes	
8	8:20	TH	1	163	25.0		9.462	157	0.38	Yes	Yes	
9	11:45	TH	1	93	25.0		7.625	169	0.04	Yes	Yes	
10	8:15	SS	1	41	25.0		6.793	144	0	Yes	Yes	
11	8:30	JG	1	106	25.0		5.855	140	0.75	Yes	Yes	
12	10:05	JG	1	92	25.0		6.158	107	0	Yes	No	
13	10:05	JG	1	114	25.0		5.620	81.6	0.09	Yes	No	
14	8:45	TH	1	125	25.0		5.288	71.6	0.68	Yes	No	
15	8:30	TH	1	147	25.0		6.139	87.7	2.52	Yes	No	
16	10:15	TH	1	91	25.0		15.66	854	1.73	Yes	No	
17	14:55	NG	1	0	25.0		0.12*	1890	0.50	Yes	Yes	* Weir pulled- storm
18	11:00	SS	1	94	25.0		8.250	437	0	Yes	Yes	Weir replaced
19	9:10	JT	1	80	25.0		10.00	248	0	Yes	Yes	
20	10:00	JT	1	90	25.0		9.990	193	0.43	Yes	Yes	
21	8:55	JT	1	90	25.0		9.902	184	0	Yes	Yes	
22	8:00	SS	1	97	25.0		9.022	148	0	Yes	Yes	
23	9:15	SS	1	121	25.0		8.269	126	0	Yes	Yes	
24	8:10	SS	1	102	25.0		7.800	115	0	Yes	Yes	
25	9:10	SS	1	113	25.0		7.282	103	0	Yes	Yes	
26	6:40	KS	1	123	25.0		6.900	94.2	0	Yes	Yes	
27	7:30	KS	1	112	25.0		6.050	85.9	0.03	Yes	Yes	
28	8:15	JT	1	89	25.0		6.315	79.9	0	Yes	Yes	
29	7:45	SS	1	83	25.0		6.001	74.9	0	Yes	Yes	
30	9:40	KS	1	85	25.0		5.797	70.9	0.82	Yes	Yes	
31	8:05	SS	1	137	25.0		6.813	160	0.05	Yes	Yes	

San Lorenzo Valley Water District
Loch Lomond Water Supply
January 2019

Loch Lomond Water Level

Week ending 2 / 06 / 2019
(in feet above mean sea level; lake spills at 577.15 feet)

Currently:	577.50 ft
Percent of Capacity:	100.00%

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 delivers 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

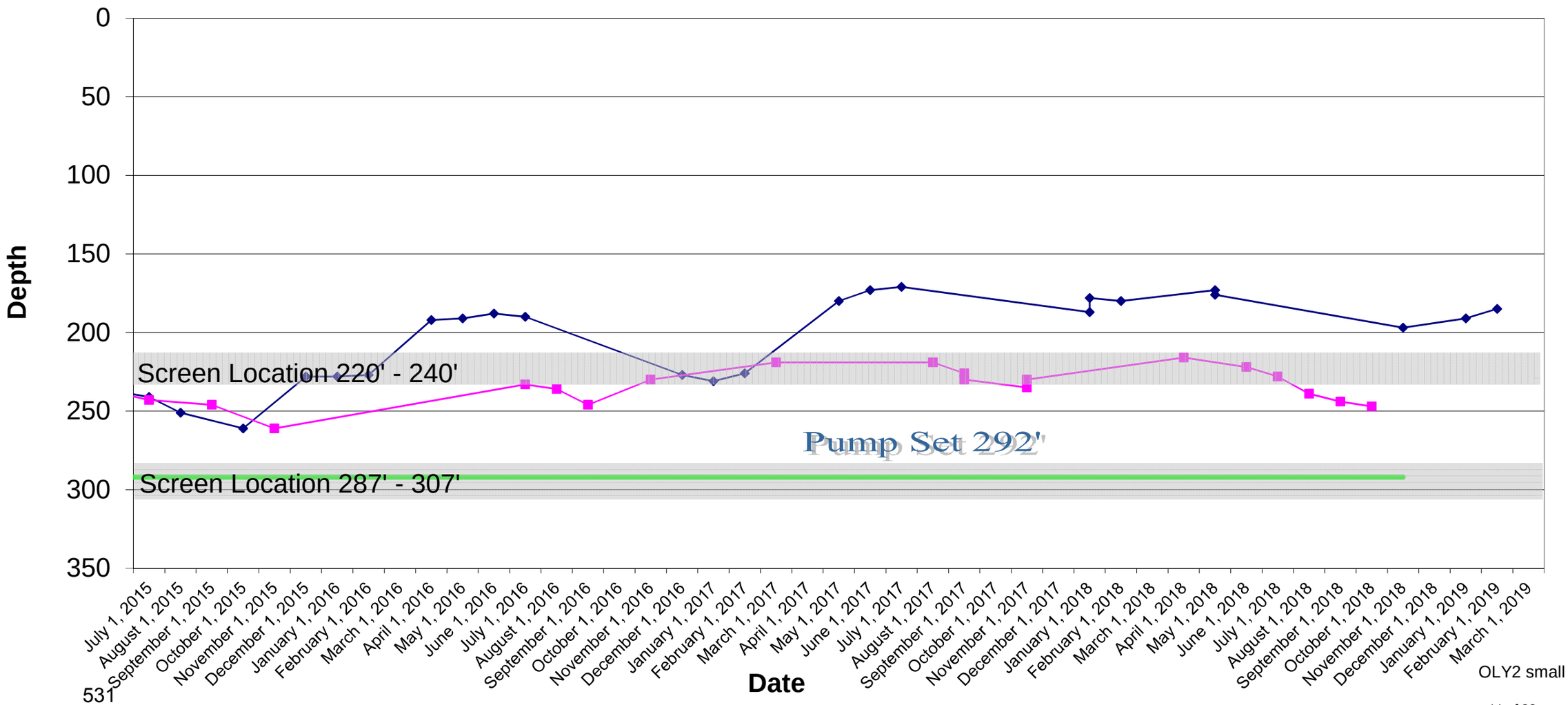
Date	Total Used	Total Available
1976 July to June 1977	353 AF	
1977 July to June 2015	0	313 AF
2015 July to 02/2016	0	313 AF
2/20/16 to Current	0	313 AF

Last time District used Loch Lomond water was June 1977

SAN LORENZO VALLEY WATER DISTRICT

Well Drawdown Report
Olympia 2

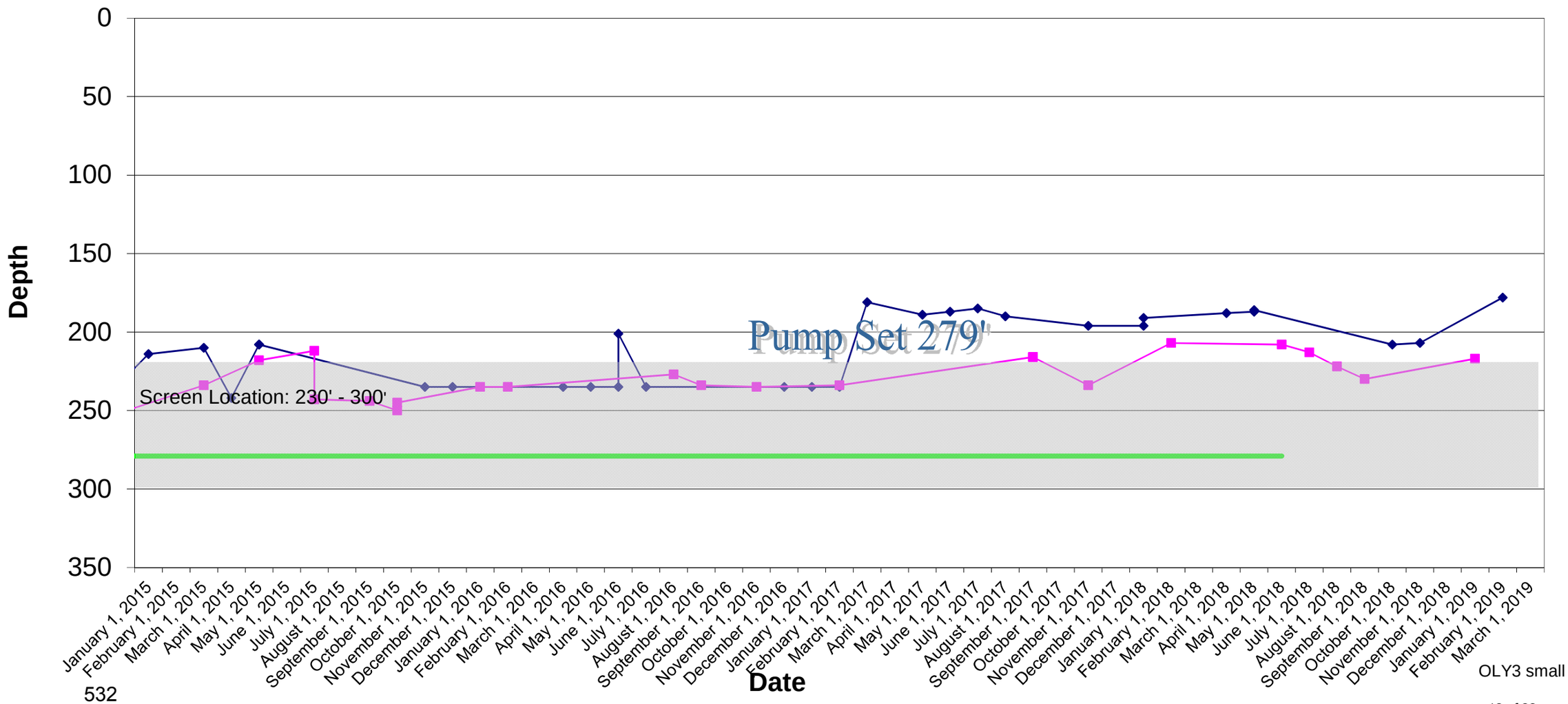
Location: 7701 E. Zayante Rd.
Elevation: 525'
Installed: April 28, 1980
State Well #:10S/O2W-11P01
New #: 4410014-010
Completed Depth: 300'



OLY2 small

SAN LORENZO VALLEY WATER DISTRICT
Well Drawdown Report
Olympia 3

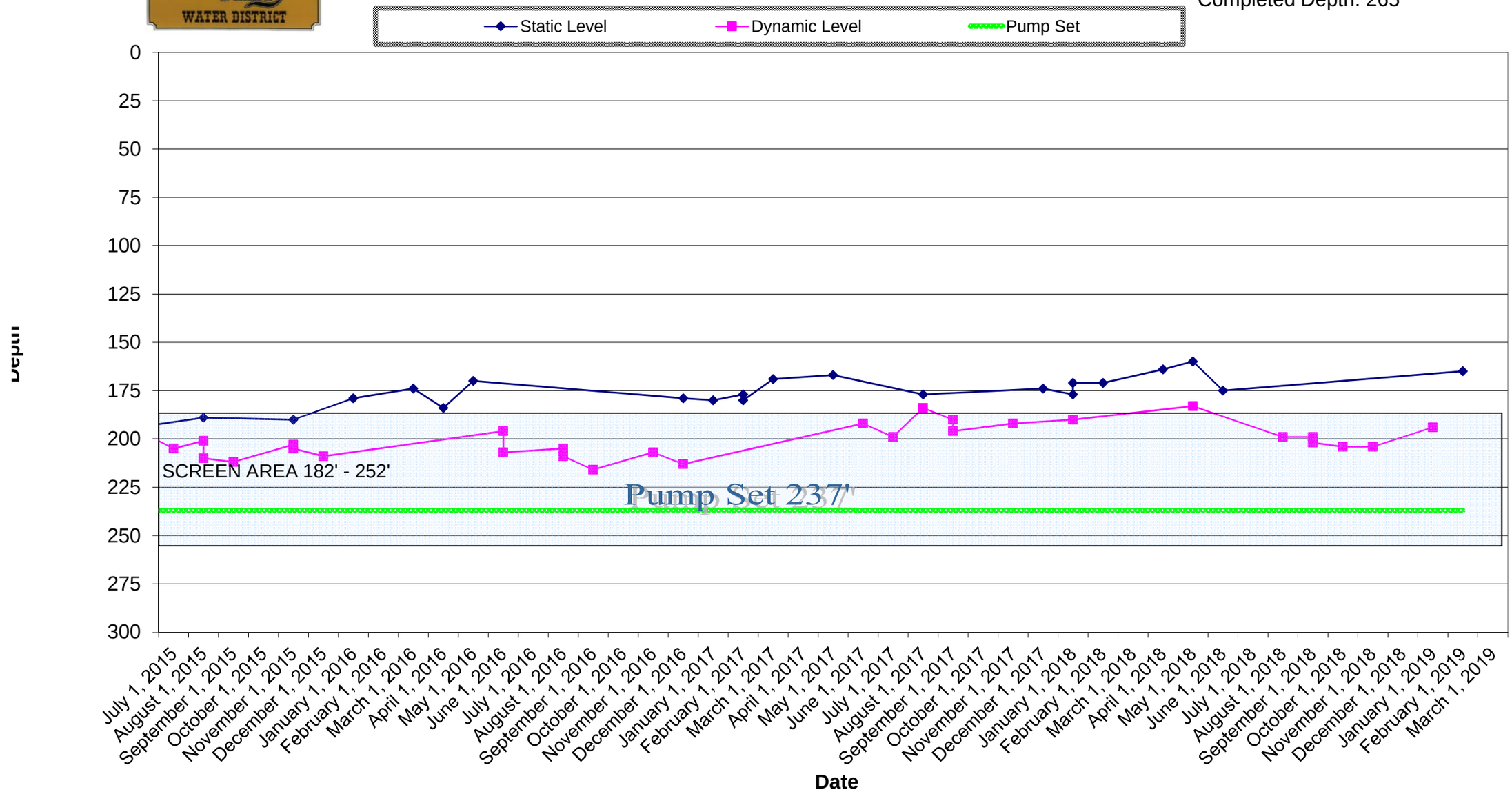
Location: 7701 E. Zayante Rd
Elevation: 538' Mean Sea Level
Installed: 8-15-90
State Well #: 4410014-022
Completed Depth:



OLY3 small

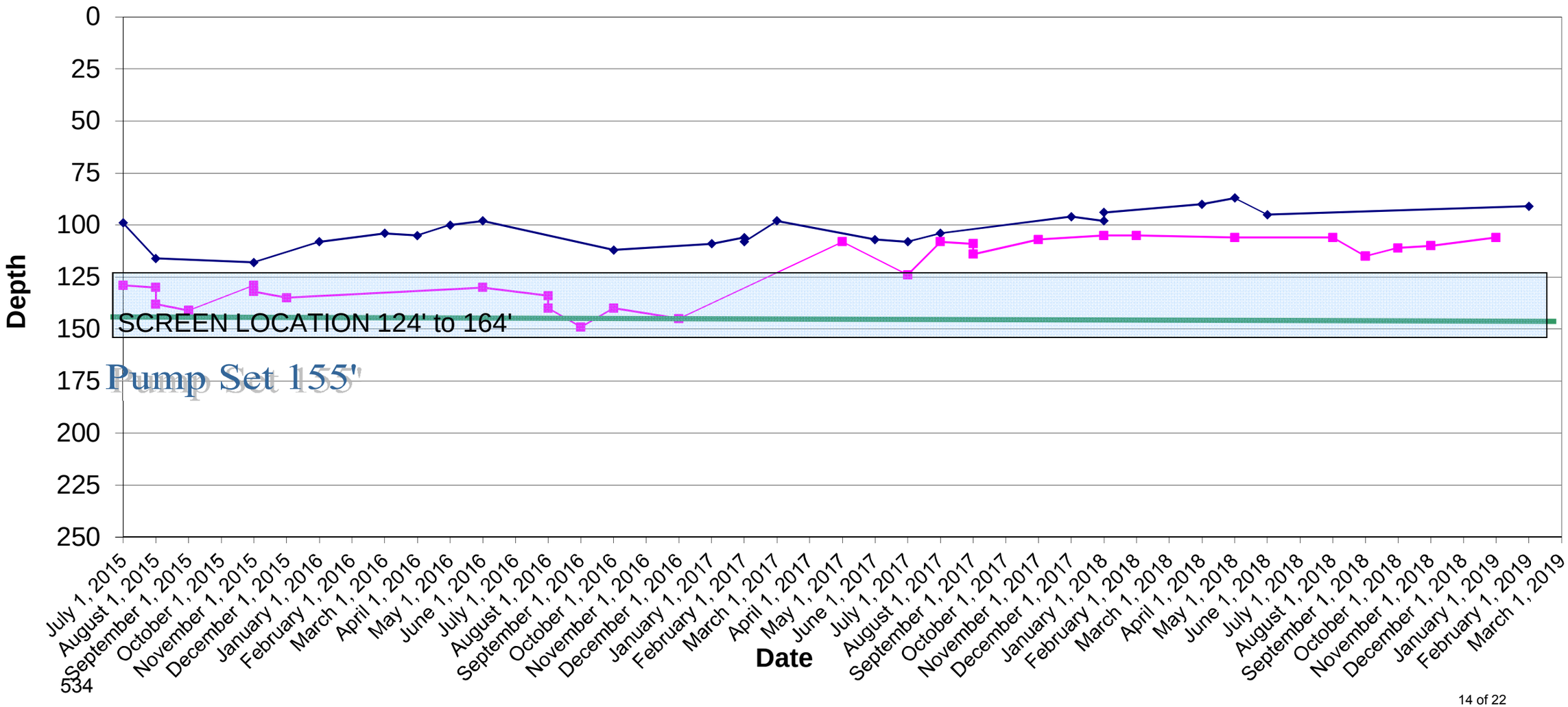
SAN LORENZO VALLEY WATER DISTRICT
Well Drawdown Report
Quail Well 4-A

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'



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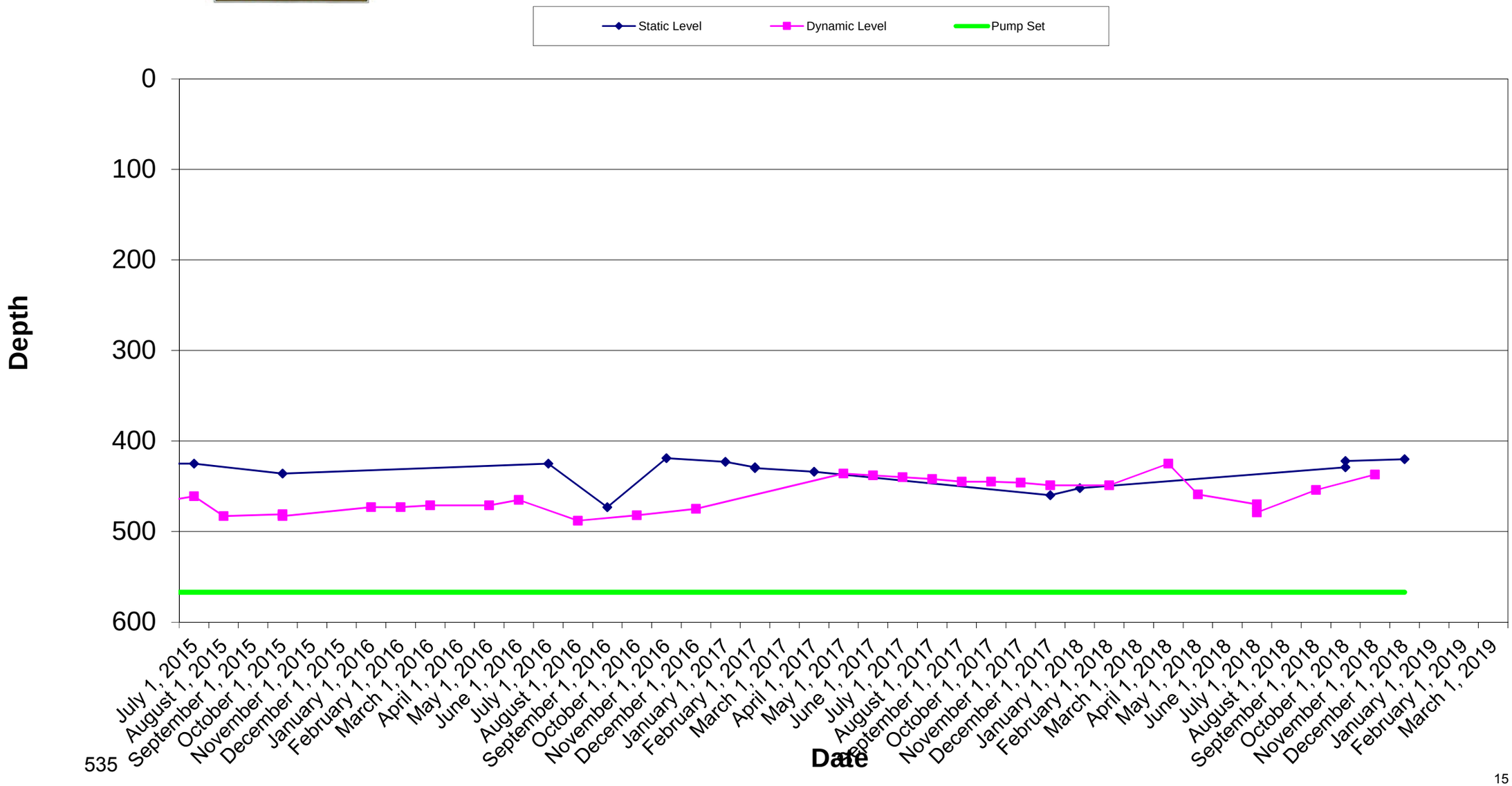
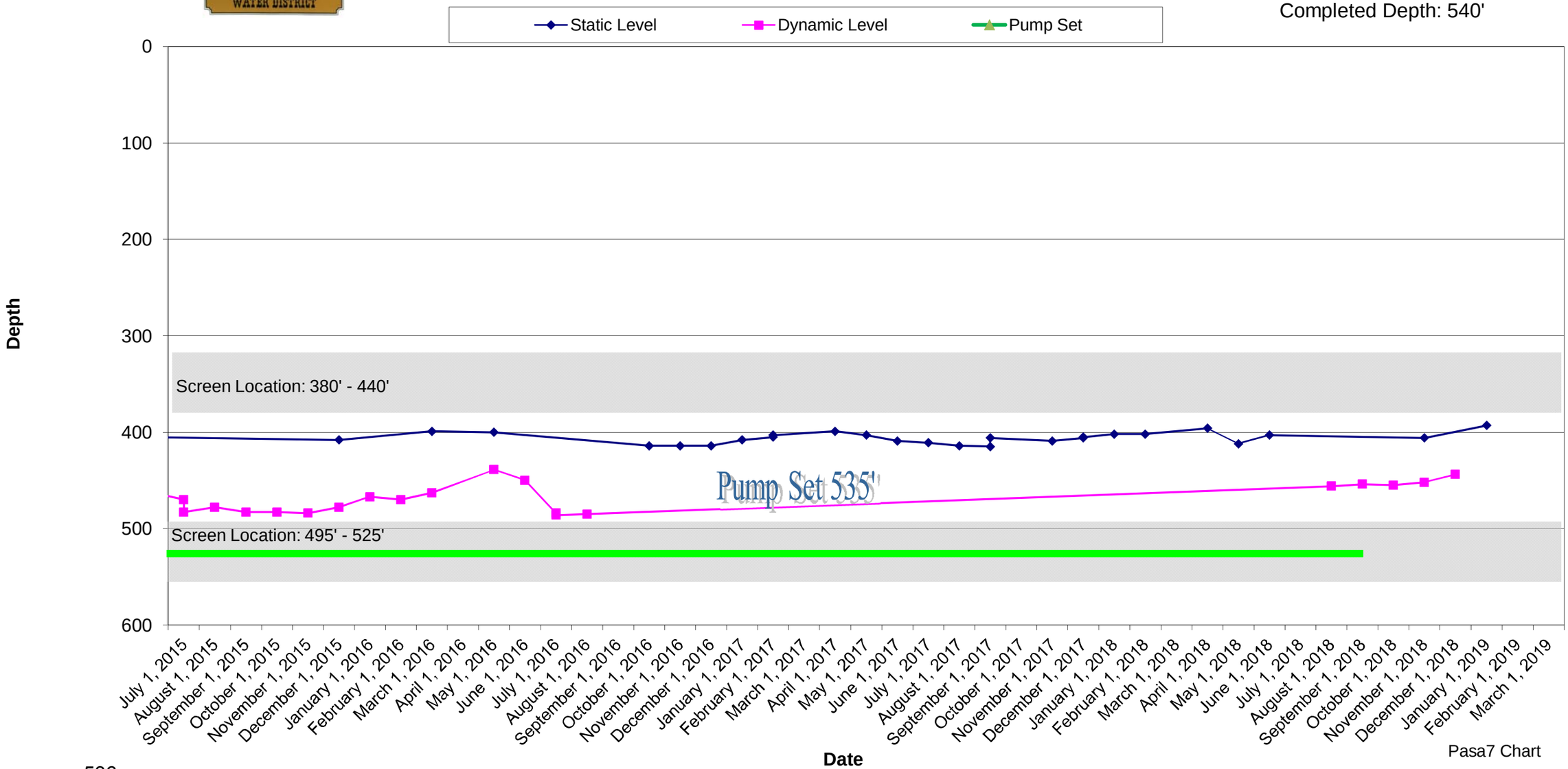
SAN LORENZO VALLEY WATER DISTRICT
Well Drawdown Report
Pasatiempo 5-A

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 7

Location: South of Probation Center
Elevation: 734' MSL
Installed: July 21,1990
State Well #: 4410014-024
Completed Depth: 540'



Pasa7 Chart

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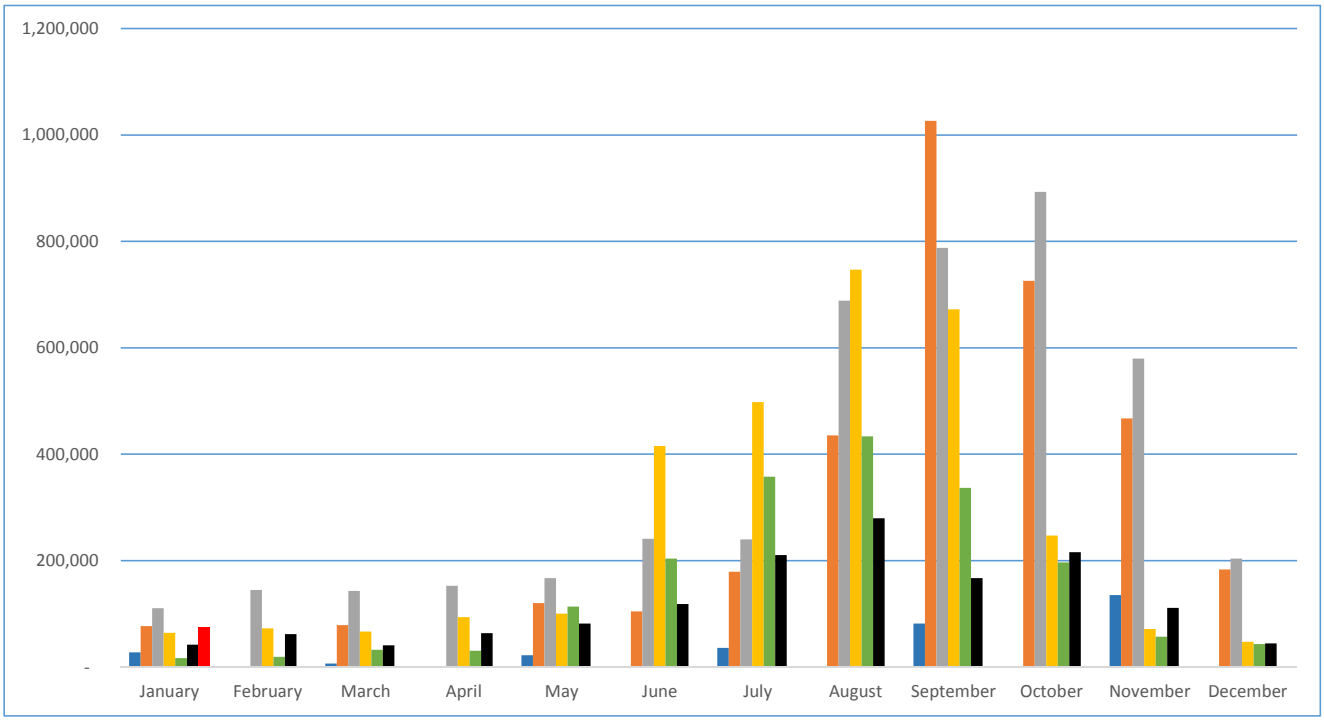
SAN LORENZO VALLEY WATER DISTRICT
BULK WATER SALES
GALLONS
January 2019



Month	2013	2014	2015	2016	2017	2018	2019
January	26,928	76,296	109,965	63,850	16,456	41,888	74,800
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	63,580	
May	21,692	119,680	166,804	100,232	112,948	81,532	
June		103,972	240,983	415,140	203,179	118,184	
July	35,904	178,772	239,360	497,420	357,544	210,188	
August		435,336	688,160	746,504	433,092	279,004	
September	81,352	1,026,256	787,644	672,183	336,570	166,804	
October		725,560	893,112	246,840	195,976	215,424	
November	134,640	466,752	579,700	71,060	56,848	110,704	
December		183,260	203,456	47,124	42,636	44,132	
Totals	306,500	3,394,424	4,349,008	3,092,981	1,836,033	1,433,198	74,800

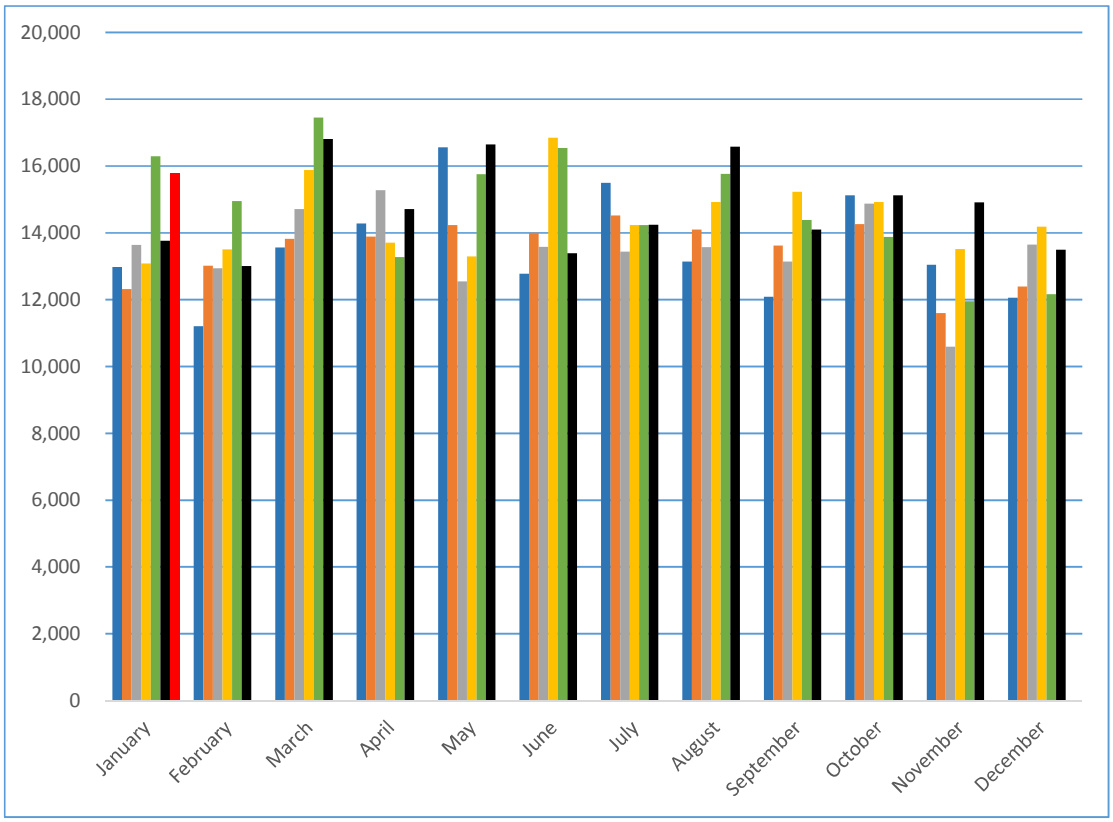
SAN LORENZO VALLEY WATER DISTRICT
MONTHLY LEAK REPORT
January 2019

Leak Type	Location - NORTH SYSTEM	Town	Gallons Lost
400 MAIN LEAKING	8255 OAK AVE.	BEN LOMOND	7,200
400 MAIN LEAKING	8945 Redwood Dr	BEN LOMOND	18,375
400 MAIN LEAKING	9695 LIVE OAK AVE	BEN LOMOND	5,760
400 MAIN LEAKING	9545 CENTRAL AVE	BEN LOMOND	2,880
400 MAIN LEAKING	Production meter leaking Quail 4A well	BEN LOMOND	3,600
400 MAIN LEAKING	334 MORE DR	BOULDER CREEK	201,600
400 MAIN LEAKING	13515 WEST PARK AVE.	BOULDER CREEK	2,160
400 MAIN LEAKING	225 BAND ROAD	BOULDER CREEK	960
400 MAIN LEAKING	995 CREEK DR	BOULDER CREEK	720
		TOTAL	243,255
	FELTON SYSTEM		
400 MAIN LEAKING	5765 HILLSIDE DR	FELTON	2,800.00
400 MAIN LEAKING	1160 LAKESIDE DR	FELTON	5,760.00
		Total Felton System	8,560
	LOMPICO		
400 MAIN LEAKING	10641 VISITAR ST.	LOMPICO	17,280
400 MAIN LEAKING	11844 SUNSET CT.	LOMPICO	28,800
400 MAIN LEAKING	10926 SEQUOIA AVE	LOMPICO	17,280
		Total Lompico	63,360
	SCOTTS VALLEY		
		Total Scotts Valley	-
		Total All Systems	**315,175**

Water Quality Complaint List

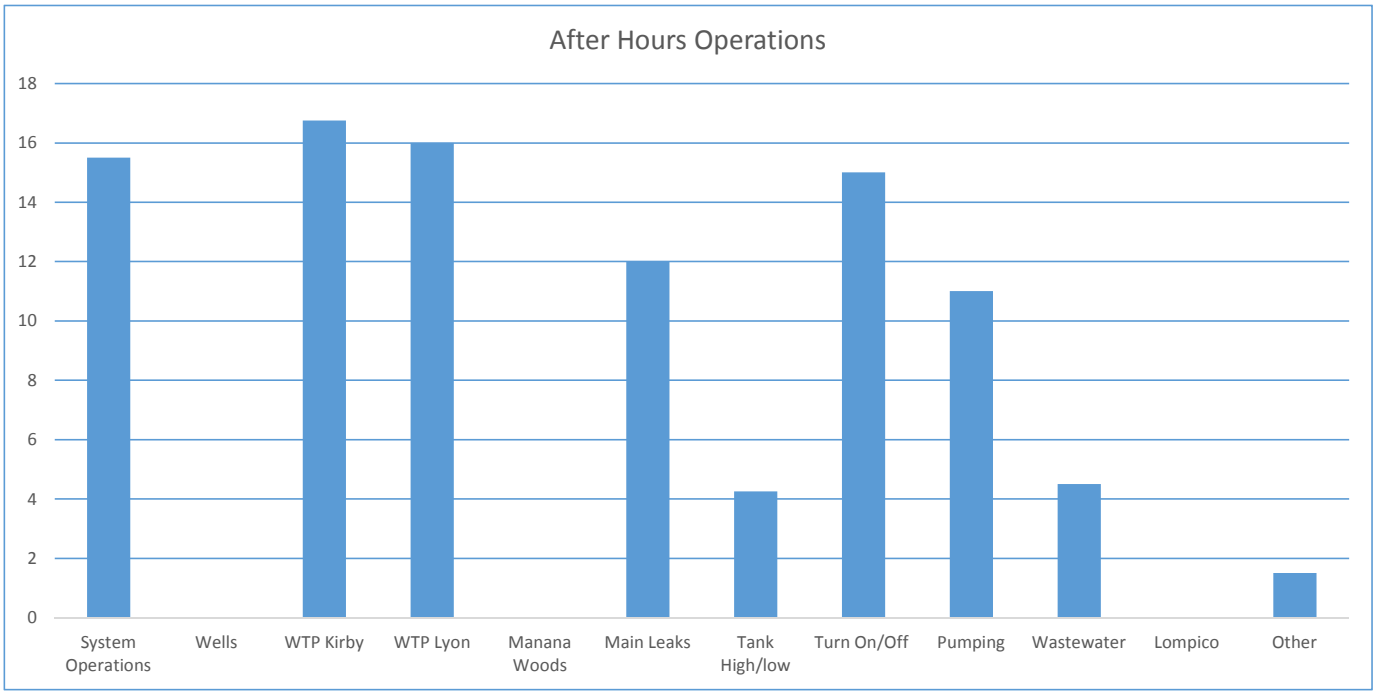
Date Received	Type Of Complaint							Address	Conclusion	System
	Taste/ Odor	Color	Turbidity/ Particles	Worms/ Other Visible Organisms	Pressure (High/Low)	Illness (Waterborne)	Other (Specify)			
1/29/2019	X						Customer complained of metallic/chlorine odor	14870 Virginia Ave	Upon investigation by SLVWD staff, a slight mettalic odor (most likely due to chloine) was observed. A sample was analyzed for free chlorine at customers hose bib, and was 0.9 mg/L, which is considered to be normal and within range. Customer was advised to flush internal plumbing and call back if the problem persists.	SLVWD-North
1/31/2019	X						Customer complained of chlorine odor	11100 Hwy 9	Upon investigation by SLVWD staff, water quality results appeared to be normal and within range. Free chlorine at the customers front hose bib was 0.8 mg/L. Customer was informed of results and will call back if the odor persists.	SLVWD-North

SAN LORENZO VALLEY WATER DISTRICT
VEHICLE MILEAGE
January 2019



Month	2013	2014	2015	2016	2017	2018	2019
January	12,976	12,317	13,633	13,082	16,286	13,763	15,790
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	14,711	
May	16,560	14,228	12,550	13,290	15,757	16,646	
June	12,780	14,000	13,582	16,841	16,534	13,390	
July	15,497	14,519	13,441	14,228	14,229	14,242	
August	13,136	14,096	13,569	14,923	15,761	16,576	
September	12,087	13,622	13,137	15,229	14,388	14,094	
October	15,120	14,261	14,868	14,924	13,880	15,126	
November	13,046	11,594	10,591	13,510	11,952	14,908	
December	12,060	12,394	13,648	14,187	12,158	13,492	
Totals	######	#######	######	173,305	######	176,760	15,790

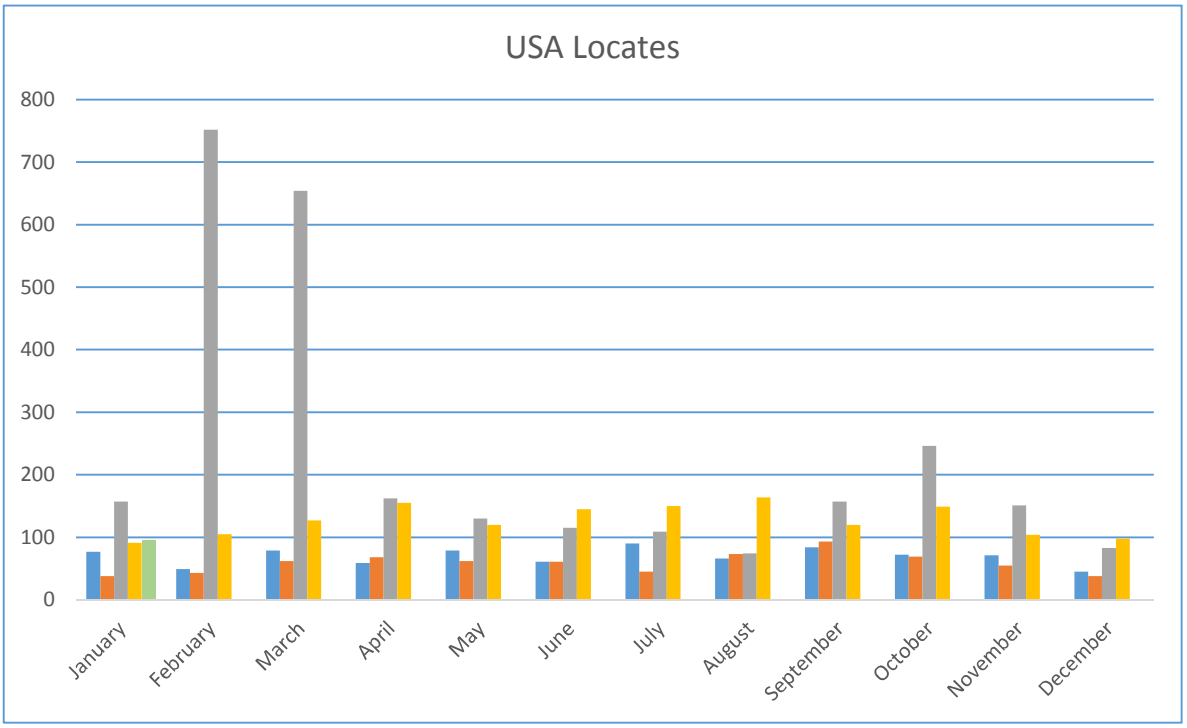
SAN LORENZO VALLEY WATER DISTRICT
OPERATIONS DEPARTMENT
January 2019



Description	Hours
System Operations	15.5
Wells	0
WTP Kirby	16.75
WTP Lyon	16
Manana Woods	0
Main Leaks	12
Tank High/low	4.25
Turn On/Off	15
Pumping	11
Wastewater	4.5
Lompico	0
Other	1.5
Total	96.5

	2015	2016	2017	2018	2019
January	N/A	145.00	280.75	90.50	96.50
February	N/A	86.50	192.25	72.00	
March	N/A	153.75	105.75	80.25	
April	82.50	72.00	128.75	19.00	
May	104.75	49.25	132.75	105.5	
June	172.50	83.25	112.75	89.00	
July	124.25	80.25	162.00	145.25	
August	111.75	81.25	141.25	134.5	
September	230.25	175.00	201.25	155.25	
October	128.25	78.50	104.00	111.5	
November	114.25	96.25	122.50	197.5	
December	186.25	130.75	134.00	220.25	
	1254.75	1231.75	1818.00	1420.50	96.50

SAN LORENZO VALLEY WATER DISTRICT
OPERATIONS DEPARTMENT
January 2019



Month	2015	2016	2017	2018	2019
January	77	38	157	91	95
February	49	43	752	105	
March	79	62	654	127	
April	59	68	162	155	
May	79	62	130	120	
June	61	61	115	145	
July	90	45	109	150	
August	66	73	74	164	
September	84	93	157	120	
October	72	69	246	149	
November	71	55	151	104	
December	45	38	83	98	
Total to Date	832	707	2,790	1528	95

M E M O

TO: Board of Directors

FROM: District Manager

PREPARED BY: Environmental Programs Manager

SUBJECT: Environmental Department Status Report

DATE: February 21, 2019

RECOMMENDATION:

It is recommended that the Board of Directors review and file the Environmental Department status report.

SUSTAINABLE WATER SUPPLY PLANNING

CITY OF SANTA CRUZ: WATER RIGHTS PROJECT, RIVER BANK INFILTRATION STUDY & INJECTION STUDY
Staff will be meeting with staff at the City of Santa Cruz to clarify and discuss the City's proposed water rights changes, River Bank Infiltration Study and the Injection Study.

CONJUNCTIVE USE GRANT

- Hydrological Assessment is complete. Final report presented to board on February 7 & 21, 2019.
- Fish Assessment underway.
- Public Engagement Workshop to be announced following Fish Assessment Report Completion.

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.

STREAMFLOW, TEMPERATURE AND RELATED OBSERVATIONS FOR THE SAN LORENZO VALLEY WATER DISTRICT'S SURFACE SOURCES OF COMMUNITY WATER SUPPLY *WATER YEAR 2014 TO 2017*
Planning for water year 2019:

The District has been conducting Stream gaging associated with the District's surface water diversions since WY 2014 to learn more about how the District's water supply production impacts habitat in the San Lorenzo River and associated tributaries.
Staff facilitated a Regulatory Agency meeting to discuss the results of the study and to discuss the future of the program, in addition to the Conjunctive Use Planning Effort.
Staff conducted a public, board workshop on February 7th to discuss the District's Water Supply Outlook and to bring the new board up to speed with the effort.

SANTA MARGARITA SUSTAINABLE GROUNDWATER MANAGEMENT AGENCY (SMGWA.ORG)

- Staff provides ongoing support and District representation at the SMGWA at staff level.
- An RFP for a Technical Consultant is underway which will correct the deficiencies identified in the hydrologic model, and assist with the technical writing of the Sustainable Groundwater Management Plan.
- Staff meets with the Facilitation Committee in a publicly noticed meeting on monthly, to plan a series of 3 Educational Workshops that will focus on Local Hydrology, Land Use & Water and Integrated Water Management & Surface Water Groundwater Interactions.
- The next SGMWA Meeting is scheduled for Thursday, March 28th at 7:00 PM at Scott's Valley Water District. For more information http://smgwa.org/

ENVIRONMENTAL COMPLIANCE - CAPITAL IMPROVEMENT PROGRAM

SANDHILLS HABITAT CONSERVATION PLAN FOR THE SAN LORENZO VALLEY WATER DISTRICT CAPITAL IMPROVEMENT PLAN

District is preparing a Habitat Conservation Plan to mitigate the impacts to listed species in sandhills habitat which result from the District's Capital Improvement Projects. The HCP will cover the District's capital improvement projects, operations and maintenance activities, and watershed management actions, that impact species protected by the

Endangered Species Act (ESA) and sensitive habitat of the Santa Cruz sandhills. The District Sandhills HCP (DSHCP) will provide the basis for the United States Fish and Wildlife Service (USFWS), which administers the ESA for terrestrial species, to issue the District an Incidental Take Permit (ITP) to cover all of the capital improvement projects, operations and maintenance activities, and watershed management actions that affect the covered species. This approach will greatly reduce the timeline and cost for project permitting compared to preparing individual HCPs for each project or site. Timeline to Submit HCP for agency review is December 2019. Cost for development of HCP: $129,000

CIP PROJECT PERMITTING
CEQA Lion Pipeline Project – Public comment period opening January 22th, 2019. CEQA documents available in January 18th board packet. Public Hearing scheduled February 21, 2019.

Staff is working to secure permits for the following Projects:
Fall Creek Fish Ladder Project Cost: $ 1,160,000
Lion Treatment Plan Access Road Slide (FEMA funded)
Lompico Tank Replacement Program

WATERSHED MANAGEMENT

ZAYANTE CREEK STREAM WOOD HABITAT ENHANCEMENT PROJECT
The San Lorenzo Valley Water District owns about 0.5 mile of Zayante Creek upstream of the Mountain Charlie Gulch confluence. This stream reach has the potential to serve as extremely valuable spawning and rearing habitat for both steelhead and Coho salmon. With the District's ownership, this reach is not impacted by residential development, which is prevalent in lower Zayante Creek, and is down stream of multiple obstructions that limit steelhead access into upper Zayante Creek.

The project focuses on habitat enhancement measures on publicly held properties, owned by the City and the SLVWD, with the objective of developing cost-effective restoration actions that attempt to restore historic functions that created and maintained the physical habitat necessary to support key life stages for these listed species. The design process to date has included technical review, site visits, and collaboration with the City, SLVWD, the City's consulting forester, County of Santa Cruz, Santa Cruz County Resource Conservation District, National Marine Fisheries Service, and California Department of Fish and Wildlife.

Timeline:

1. October 2, 2014: The SLVWD Board granted permission for the project to take place on District property.
2. July 2018: Resource Conservation District received a grant from State Water Resources Control Board for the Upper Zayante Creek Stream Wood Enhancement Project, and are in the process of mobilizing to begin work.
3. 2019: District to enter into cooperative agreement associated with permitting and implementation of the project.
4. 2018-19: Acquire Permits from State and Federal agencies, under the direction of the RCD.
5. Summer 2019: Large wood to be installed.

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. Staff is also working to create a post-fire plan to ensure the District's water resources after a fire event.

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

Water Conservation Rebate Quarterly Report

FY 18/19 Q2 Ending Dec 31, 2018

Type	Water Savings by type	# Rebates	Amount	Water Saved Gallons per year
Drip	4,500 gpy/ 500sf	0	$ -	0
Clothes Washers	5100GPY	3	$ 300.00	15300
Recirculation System	7800GPY	0	$ -	0
Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	$ -	0
Toilet 1.6	1280 gpy	3	$ 225.00	3840
Toilet 3.5	5000gpcy	7	$ 1,211.99	140000
Irrigation Controler	1.7g/sqft/y	0	$ -	0
Greywater Irrigation	14,565 gpy	0	$ -	0
		13	$ 1,736.99	159140

WATER CONSERVATION DEVICES PURCHASED 2018

Supplier	Device Type	QTY	Cost
New Resources	Hose Nozzles	50	$ 99.50
New Resources	0.5 Aerators	100	$ 113.00
New Resources	Hose Nozzles	100	$ 387.00
New Resources	1.5 Shower Heads	250	$ 733.49
New Resources	Promotional Sponges	500	$ 464.85
New Resources	Hose Nozzles	50	$ 136.65
AM CONSERVATION	Hose Nozzles	150	$ 182.44
Total spent			**$ 2,116.93**

Additional efforts to reduce water consumption system wide include:

- Staff is working with teachers throughout District to plan conservation workshops & in-class presentations for Spring 2019
- Staff is working to create a 2019 outreach and messaging plan for water conservation.
- Annual Water Conservation Video Contest prep has begun and staff has contacted teachers within District to offer free in class presentations.
- Water audit program formation is complete. Staff is currently working with commercial and high water users. Water-wise audits are being offered upon request to all customers. Staff will begin to advertise and add water audit information to the District website in Spring 2019.
- Staff completed two large institutional water user water-wise audits in 2018. Both accounts have begun to implement suggested water saving findings and committed to lower their usage.
- Water Conservation Coalition of Santa Cruz meeting bi-monthly. Will discuss rebate programs, upcoming workshops, future events and water wise programing.
- Water conservation staff to take over high usage and leak prevention tagging follow-ups.
- Conservation staff reordering conservation devices and outreach materials. Currently all water conservation devices in stock. Staff plans to reassess inventory in Spring of 2019.
- Staff working to update current rebate programs and add additional programs. New programs to be considered by the Board in Spring 2019.
- 2019 Education and Data Collection grant schedule and planning initiated November 2018. New Education Commissioners have not been appointed by elected board members. Education and Data Collection Grants will not be offered until an Education Commission is seated.

- Environmental staff monitoring and mapping invasive species on District properties.
- Staff working to receive Water Efficiency Certification through AWWA.
- Create content for public outreach such as videos, content for social media and district workshops. Working with various agencies to create content efficiently.
- Environmental staff prepping to create a schedule of District run community workshops and volunteer events for 2019.
- Staff will hold first volunteer broom-pull in April – details

CLIMATE ADAPTATION

- The initial phase of competing the Climate Action Plan is to inventory existing carbon outputs from District operations. District plans to use 2012 as the base year and update inventory from 2017 onward.
- Staff has summarized all 2017 and onward District GHG emissions data to update "Our Carbon Footprint" page on the District website.
- Environmental staff has initiated a Climate Action Plan. Staff will undergo training on climate change planning in preparation to write SLVWD's Climate Action Plan (2020 Urban Water Management update will require a thorough reporting of climate mitigation and adaption strategies).

PUBLIC OUTREACH

- The District Facebook page and website are updated regularly (5-7 times per week).
- Staff is conducting regular interviews on KBCZ regarding drought, infrastructure projects and other news from SLVWD.

FELTON LIBRARY OUTDOOR EDUCATION PARK
Staff continues to participate as part of the Felton Library Environmental Literacy Programming. Community stakeholders meet monthly to discuss design, outreach & education opportunities for the Nature Discovery Park that will be associated with the new Felton Library.

UPCOMING EVENTS

SANTA MARGARITA GROUNDWATER AGENCY ANNOUNCES THREEPART 'UNDERSTANDING OUR WATER' EDUCATIONAL SERIES

The meetings will be held the second Saturdays of the month from January to March at Felton Community Hall from 9 a.m. to 1 p.m.

• March 9: Managing Groundwater: How Can We Prepare for an Uncertain Future?

FELTON LIBRARY OPEN HOUSE – March 16th at 1:00pm – 4:00pm the Felton Community Hall (http://www.feltonlibraryfriends.org/open-house-for-new-library-park-march-16/)

STATE OF THE SAN LORENZO RIVER – March 23 at 10:00 at Louden Nelson Center

NETWORKING/ COLLABORATIONS

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.

FIRE SAFE COUNCIL OF SANTA CRUZ COUNTY https://www.firesafesantacruz.org/
Staff represents SLVWD and sits on the Board of the Fire Safe Santa Cruz County FSSCC and participates as one of the Directors on the Community Outreach Committee.

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.

FSCSCC is currently seeking applications from community members in need of funding to reduce fire hazards in their neighborhoods. Contact Fire Safe SCC for applications.

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 WMA will continue its use of the Calfora Observer app 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. On 01/08/19 the WMA held its fall quarter meeting. Networking, discussion of current invasive species and invasive removal practices were discussed. Ken Moore presented as special guest. The next meeting will focus on glyphosate and its uses for controlling invasive plant species.

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.scmbc.org/
Jen Michelsen serves 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.

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. Planned meeting for late January 2019.

COMPLETION REPORTS 2019

Staff has completed permits for the following USDA Loan Projects:

Swim Tank $ 678,000 Hihn Road Pipeline $ 90,000 Lyon Pipeline $ 450,000 Worth Lane Pipe $ 120,000 Sequoia Road Pipe $ 120,000 Bennett Booster $ 390,000 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

Climate Registry Green House Gas Inventory of 2017 has been completed and completed verification through Cameron-Cole, LLC. Information has been updated on the website under Our Carbon Footprint.

MINUTES OF SPECIAL 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, **January 17, 2019 at 9:30 a.m.** at the Operations Building, 13057 Highway 9, Boulder Creek, California.

MINUTES: Due to technical difficulties this meeting was not recorded.

1. Convene Meeting 9:35 am
   Roll Call: Dir. Bruce, J. Gomez present. B. Smallman absent.
   Staff: J. Michelsen-Environmental Programs Manager, H. Hossack-District Secretary

2. Oral Communications:

   R. Moran-Ben Lomond addressed the Committee.

3. Old Business: N o n e

4. New Business:
   Members of the public will be given the opportunity to address each scheduled item prior to C o m m i t t e e action. The Chairperson of the Committee may establish a time limit for members of the public to address the Committee on agendized items.

   A. ELECTION OF COMMITTEE CHAIR
   Motion to nominate Margaret Bruce as chair.
   Discussion by the Committee and staff regarding Committee Chair.
   C. Baughman supports Margaret.
   All present voted in favor of the motion. Motion passed

   B. SET DAY AND TIME FOR COMMITTEE REGULARLY SCHEDULED MEETINGS
   3rd Tuesday @10:00 am preferred by all.
   Discussion by the Committee regarding regularly scheduled meeting time and day.
   R. Moran addressed the Committee.
   Discussion by the committee and staff.
   R. Moran addressed the Committee again.
   Discussion by the Committee and staff.
   C. Baughman addressed the Committee.
   Discussion by the Committee and staff.
   3rd Tuesday @ 10:00am was confirmed as the regularly scheduled day and time.

   C. SLVWD ENVIRONMENTAL ACTION WORKSHOP AGENDA
   J. Michelsen introduced this item. Presentation of Environmental Department Action Plan draft.
   Discussion by the Committee, staff and public regarding the agenda for the Environmental Action workshop (2.7.19 BoD)
   J. Gomez thanked Jen for her effort.

5. Informational Material: None.

6. Adjournment 10:59am

Lompico Assessment District Oversight Committee

Minutes of Special Meeting January 28, 2019
held at Zayante Fire Station, 2700 E. Zayante Road, Felton CA

CHARTER WRITING WORKSHOP

The meeting was called to order at 5:35 p.m.

All five committee members were present: Chair Toni Norton, Vice Chair Mary Ann LoBalbo, Jenni Gomez, John Wright, and Debra Loewen.

Staff attending: District Manger Rick Rogers, and Finance Manager Stephanie Hill.

Board Members attending: Board President Lois Henry, Director Bob Fultz.

Toni Norton welcomed all attending this workshop. Debra Loewen agreed to take minutes.

Oral Communications: none

Debra was welcomed by the Chair as the newest appointed member to the committee.

The Chair led the committee in a workshop review of the five charter ideas, one submitted by each member, with discussion and input from staff and the public, going section by section. Participating members of the public included Chuck Baughman, Ed Frech, and Pete Norton.

Board members offered the committee support in drafting this charter per the 2018 Grand Jury recommendations.

Elements discussed and agreed upon by consensus of the committee were unified and incorporated into one master document as a template, to be drafted for final review of the committee at their next meeting.

Toni proposed that two members work on the draft for presentation.
Jenni Gomez made a motion for Toni Norton and Debra Loewen to compose the draft; seconded by John Wright. The motion carried unanimously.

The District Manager requested a copy be sent to him as soon as available, as well as the District Secretary, to be included in the next committee meeting agenda packet.

Next Meeting date: Stephanie Hill said the next LADOC quarterly financial report is due to be presented at the end of February; a tentative meeting date was set for February 26 at 5:30 pm, with alternate date Feb 27, to be determined on checking schedules. This meeting will take place at the district's Boulder Creek Operations building.

The meeting adjourned at 7:47 pm.

FEB 4 19

RECEIVED
FEB 03 2019
SAN LORENZO VALLEY
WATER DISTRICT

SLV WATER BOARD
(#3)

DEAR MR. RICHARD, AND THE REST OF YOU BOYS & GIRLS. I HAVE TO APOLOGIZE TO YOU. I'M STILL TOO SICK, AND TOO CONTAGIOUS TO JOIN YOUR LITTLE PARTY ON THURSDAY.

I WAS REALLY LOOKING FORWARD TO GIVING YOU THE ROYAL THRASHING THAT YOU SO RICHLY DESERVE.

RICHARD, YOU COMPLETELY IGNORED EVERY POINT I MADE IN MY OTHER LETTERS. ALL YOU COULD FIND TO SAY TO ME IS "WE CAN'T AFFORD IT."

HOW CAN THIS BE?

WHEN YOU ARE HOLDING THE WHOLE VALLY HOSTAGE TO YOUR REDICULOUSLY OVER PRICED WATER BILLS.

DON'T YOU DARE TRY TO CALL YOURSELVS PUBLIC SERVENTS. YOU ARE NOT. YOU ARE PUBLIC ROBBERS...

SO YOU'RE GOING TO DO WHAT YOU WANT, AND THE HELL WITH EVERYONE ELSE.

YOU'RE A BUNCH OF HARDHARTED BEAVROCRATIC PIGS. IN BIBLICAL TERMS YOU ARE A DEN OF THEIVES!!

I WILL MAIL MY CHECKS FROM NOW ON, AND AVOID YOUR CONDESCENDING DISSMISSIVE ATTITUDES.

DON'T YOU EVER STIR UP MY P.T.S.D. AGAIN!!

DUANE COX

Holly Hossack

From: Karen Holl <kholl@ucsc.edu>
Sent: Tuesday, February 12, 2019 10:53 AM
To: Board of Directors
Cc: Ingrid Parker; Ken Moore; Trumbo, Joel@Wildlife; Jen Michelsen
Subject: management of broom at the Olympia Wellfield site

Dear San Lorenzo Valley Water District Board of Directors,

February 12, 2019

We write as scientists and practitioners who each have many years of experience managing invasive weeds in California, as well as extensive knowledge of the rare and unique Santa Cruz Mountains sandhills habitat. We want to express our disagreement with your recent decision to ban the use of glyphosate as one of the options to control the various species of broom that are abundant on the SLV Water District's Olympia Wellfield land.

Because of our expertise, we were each asked in fall 2017 to serve on an advisory panel to review management options to control French broom on Water District land. We agreed to contribute our time to serve on this committee with no financial compensation because of our concern for conserving and restoring the sandhills habitat, while at the same time protecting the water quality and minimizing human health risks in the watershed. We made an on-site visit to the Olympia Wellfield site and met multiple times between during winter and spring 2018 to discuss management options. After visiting the site, reviewing relevant literature, and discussing the various options, we all agreed that the best option for reducing broom cover was to use a mixture of methods tailored to the density of broom and specific localized constraints (e.g. likely presence of Mt. Hermon June beetle) in different areas of the site. One of those methods includes the judicious and very limited use of glyphosate. We also strongly support the use of a staged and adaptive management approach to test different methods at this site and monitor the results to most effectively restore the site while minimizing costs and negative side effects.

We recognize the potential health risks of widespread spraying of glyphosate, which is why we only recommend dabbing the minimum quantity of glyphosate on stems of broom after cutting to prevent the broom from resprouting and only using this method in locations where other methods cannot be used due to concerns about disturbing the habitat. We know from extensive past experience in this region that broom commonly resprouts after cutting if herbicides are not applied to the stem. So repeated cutting would be needed to control broom, which would incur additional costs. We feel that hand pulling should be used when possible, but it is currently prohibited at the site by the US Fish and Wildlife Service because of concerns about the disturbance to the larvae of Mount Hermon June beetle. There are other potential broom control methods such as biological control and fire, but these have shown mixed effects in the past and also have potential unintended consequences.

We compiled a matrix of the various pros and cons of different restoration approaches, which we would be happy to share if it would be of interest to you. Our panel did not meet after May 2018 because the SLV Water District staff were overwhelmed with other tasks during summer 2018 and did not have time to draft the report. Then staff were urged not to complete and disseminate the report during the election campaign. We recognize that the membership of the Board of Directors of the SLV Water District has changed since the time the panel was constituted, but we invested considerable time reviewing options for managing the site and hope that some of the work we did will be incorporated in the management plan for the site.

We conclude by reiterating our concern about the risk that invasive brooms present to the sandhills habitat; if broom is not managed at the Olympia wellfield site it will lead to the ongoing degradation and loss of sandhills habitat and the many rare species that it hosts. Lack of strategic and science-based investment now will create a much larger financial and environmental burden for future generations. We urge you to take action to control the broom at the site and to consider the range of scientific literature and expertise available to select the most effective mix of methods at the site. We also encourage you to support monitoring of these methods to evaluate the effectiveness of the methods used.

Sincerely,

Karen Holl
Professor of Environmental Studies
University of California, Santa Cruz

Ken Moore
Founder, Wildlands Restoration Team
Santa Cruz, CA

Ingrid Parker
Professor of Ecology and Evolutionary Biology
University of California, Santa Cruz

Joel Trumbo
Environmental Program Manager, Lands Program, Wildlife Branch
California Department of Fish and Wildlife

CLAIM FORM

1. Claimant's Name: Terry Vierra Date of Claim: 02/12/2019

Daytime Phone: (831) [redacted]

2. Physical Address of Claim: 13060 Highway 9, Boulder Creek, CA 95006; 701 Ocean St. Santa Cruz, CA 95060

3. Claimant's Mailing Address: [redacted], Boulder Creek, CA 95006

4. Date of Loss: January 18, 2019 Time of Loss: 6:09 PM

5. Location of Loss (Specify in as much detail as possible, example, 5 feet east of west corner of Elmira Road and Peabody):
San Lorenzo Valley Water District Office/Board Chambers, pursuant to vote by the Board of Directors.

6. Description of incident or accident which caused you to make this claim:
SLVWD Board of Directors further discontinued representation, defense, and indemnification of Terry Vierra in relation to lawsuit brought against him (and the District), Holloway v. Vierra et al., Case No. CV180394 (filed 11/7/14), in violation of Gov Code §§ 825 et seq.; 995 et seq.

7. What specific injury, damages or other losses did you incur?
District has wrongfully refused to defend and indemnify Vierra in relation to the remanded Gov. Code § 1090 proceedings in Case No. CV180394. Vierra has been further forced to incur attorneys' fees and cost to (1) retain his own representation to defend lawsuit, and (2) file and pursue this claim.

8. What amount of money are you seeking to recover? (Check one of the boxes below):

- [ ] THE AMOUNT CLAIMED TOTALS LESS THAN $10,000. (This includes the estimated amount of any prospective injury, damage or loss, as may be known at the time of presentation of the claim). ENTER THE AMOUNT CLAIMED HERE: _____
- [x] THE AMOUNT CLAIMED IS MORE THAN $10,000 – no dollar amount shall be included in the claim but see box below.
- [ ] The claim would be Limited Civil Case (under $25,000).

9. HOW WAS THIS AMOUNT CALCULATED? (ITEMIZE AND ATTACH BILLS, REPAIR ESTIMATES, RECEIPTS, ETC.; IF CLAIM IS FOR VEHICLE DAMAGE, OBTAIN AND ATTACH TWO (2) REPAIR ESTIMATES):
Per Gov. Code § 910, no dollar amount is herein included and this claim would be an unlimited civil case. The claim amount is calculated in part according to the damages and other losses described in item 7 above, as well as other general and specific damages incurred.

10. What is your basis for claiming that the Agency or Agency employee(s) are the cause of your injury, damages or loss?

Gov. Code §§ 825 et seq.; 995 et seq. create a mandatory duty for the District to continue to defend and indemnify Terry Vierra. Gov. Code § 996.4 requires the District, upon discontinuance of defense Vierra, to pay for his attorneys' fees and costs to defend the suit.

11. What are the name(s) of the District employee(s) whom you allege caused your injury, damages or loss, if known?

San Lorenzo Valley Water District Board of Directors as of 1/17/2019 (Directors Henry, Fultz, Bruce, Swan, and Smallman),

12. Any additional information that you believe might be helpful to the Agency in considering this claim:

See attached memorandum.

13. All notices and communications with regard to this claim will be directed to the Claimant shown in lines 1 and 2 above unless you complete the following to identify to whom further communication should be directed:

Name: Nicholas Whipps Relationship: Attorney

Address: 147 S. River St. Ste. 221 State: CA ZIP: 95060

Daytime Phone: (831) 429-4055 Home Phone: (_____) _____

I/We, the undersigned, declare under penalty of perjury that I/we have read the foregoing claim for damages and know the contents thereof; that the same is true of my/our own knowledge and belief, save and except as to those matters wherein stated on information and belief, and as to them, I/we believe to be true.

Terry Vierra	Terry Vierra	02/12/19
CLAIMANT PRINTED NAME	CLAIMANT SIGNATURE	DATE SIGNED

[Note: If the claim is filed by someone on behalf of the claimant, the person making the claim on behalf of the claimant should sign above.]

This is a public document and will be released to the public if requested through California Public Records Act, Government Code 6250-6276.48

wittwer / parkin

Via Email and USPS

February 12, 2019

Holly Morrison, District Secretary
San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, CA 95006
hmorrison@slvwd.com

Re: Claim for SLVWD's Wrongful January 17, 2018 Action to "formally stop any further defense of . . . Terry Vierra… in connection with the Holloway Lawsuit,"

Dear Board of Directors:

In November of 2014, the San Lorenzo Valley Water District ("District") and Terry Vierra (then a Board member) were sued in *Holloway v. Vierra et al.*, Santa Cruz County Superior Court Case No. CV180394 ("*Holloway* Lawsuit"). The District has a continuing duty to represent, defend, and indemnify Terry Vierra under Government Code sections 825 and 995 and related laws.[1] Mr. Vierra served on the District's Board of Directors for over 24 years, and the *Holloway* Lawsuit directly resulted from actions taken within the scope of his service as a Board member. The District commenced defense and indemnification of Terry Vierra as to the *Holloway* Lawsuit on December 15, 2014

Mr. Vierra justifiably and detrimentally relied on the District fully representing, defending, and indemnifying him, and he submitted to the strategic and tactical recommendations of counsel simultaneously representing the District and Mr. Vierra in the *Holloway* Lawsuit. The District unlawfully discontinued its representation, defense, and indemnification as to Mr. Holloway's Political Reform Act Cause of Action on April 3, 2017 and as to Mr. Holloway's Government Code Section 1090 Cause of Action on January 17, 2019. Until, as hereby requested, the District resumes compliance with its obligation for defense and indemnification of Mr. Vierra, his damages claimed against the District and District officials or

[1] Caselaw has clarified that the defense and indemnification provisions of sections 825 and 995 apply to members of legislative bodies, such as Mr. Vierra. (*See, e.g.*, *Degrassi v. City of Glendora* (9th Cir. 2000) 207 F.3d 636; 47 Ops. Cal. Atty. Gen. 163 (1966) (city required to defend and indemnify council member under section 825); *Torres v. City of San Diego* (2007) 154 Cal.App.4th 214 (city required to defend board members under section 995); 57 Ops. Cal. Atty. Gen. 358 (1974) (board members have section 825 and 995 right to representation, defense, and indemnification)).

employees who caused his injuries, damages, or losses (collectively "damages") will continue to mount and will include his fees in filing this Claim and, if necessary, pursuing further litigation to recover these damages.

Terry Vierra submits this Claim against the District for indemnification against any judgment or attorney's fees award resulting from the *Holloway* Lawsuit, and for payment all past and ongoing legal fees, costs, and expenses incurred, as a result of the District's wrongful January 17, 2019 action to "formally stop any further defense of . . . Terry Vierra… in connection with the Holloway Lawsuit," including but not limited to the Mr. Vierra's efforts to obtain District representation or funding of a motion for dismissal based on the One Final Judgment Rule, other defense activities, preparation and filing this Claim, and, if necessary, pursuing this Claim in court.[2]

Factual Background

On November 7, 2014, Terry Vierra was among the Defendants sued in the *Holloway* Lawsuit for alleged violations of the Political Reform Act (Gov. Code § 81000 et seq.) and Government Code Section 1090 in relation to matters within the scope of his service as a Board member during his tenure on the District Board of Directors ("Board"). As the District initially properly recognized, Government Code section 825 entitles Mr. Vierra to representation, defense, and indemnification. More than two years into the Holloway Lawsuit, the District reaffirmed its legal responsibility to defend and indemnify Mr. Vierra pursuant to Government Code section 825 and related law, or to otherwise provide him separate counsel at the District's expense.

Judgment was final and appealable for the Political Reform Act Cause of Action of the *Holloway* Lawsuit on January 23, 2017. On the other hand, Judgment for the Section 1090 Cause of Action was final and appealable eleven months prior, as of February 24, 2016. The

[2] On September 22, 2017, Mr. Vierra submitted a separate Government Tort Claims Act Claim against the District, alleging the District acted outside of its authority when it voted on April 3, 2017 to "stop all financial commitment to the Political Reform Act case," which claim was deemed denied and is the current subject of the lawsuit Mr. Vierra filed against the District on March 26, 2018 (Superior Court Case No. 18CV00890). Mr. Vierra continues to incur expenses and face an outstanding judgment as to the Political Reform Act Cause of Action, as described in Mr. Vierra's September 22, 2017 claim. This current Claim is specific to Mr. Holloway's Government Code Section 1090 Cause of Action and the District's January 17, 2019 action to "formally stop any further defense of . . . Terry Vierra… in connection with the Holloway Lawsuit," and is in addition to, and not intended to affect the Claim made September 22, 2017 for damages arising from the District's April 3, 2017 action to "stop all financial commitment to the Political Reform Act case."

plaintiff in the *Holloway* Lawsuit appealed the Section 1090 Cause of Action against all defendants except Mr. Vierra, who was not named as a party to such appeal and who continued to be defended by Counsel for the District against the Political Reform Act Cause of Action in trial court until well after the filing of the appeal of the Section 1090 Cause of Action. On April 5, 2018, the Court of Appeal issued an Opinion reversing the decision of the trial court regarding the Section 1090 Cause of Action and remanded the Section 1090 Cause of Action to the trial court for further proceedings.

On July 11, 2018, when Wittwer Parkin LLP requested confirmation that the District will continue to provide for the legal defense Mr. Vierra in connection with remanded proceedings regarding the Government Code Section 1090 Cause of Action, the District responded on July 20, 2018 that:

> Because the section 1090 claim has been resolved as to Mr. Vierra [based on the "one final judgment rule"], there is no present need or obligation for the District to resume its defense of Mr. Vierra by hiring an attorney to represent him. Thus, the question of whether the District will provide a lawyer to defend Mr. Vierra is purely hypothetical. If circumstances change (for example, if the trial court were to entertain a motion or hearing against Mr. Vierra), it may be appropriate at that time for the Board to decide whether or not to hire an attorney to represent Mr. Vierra.

Although further proceedings as to the Section 1090 Cause of Action against Mr. Vierra are indeed barred for a number of reasons (including the One Final Judgment Rule and because Mr. Vierra was not named in the appeal of the Section 1090 Cause of Action), after the issuance of the Court of Appeal Opinion, the Superior Court gave notice of a Case Management Conference to Mr. Vierra's then Counsel Michael Colantuono (who the District had arranged to be co-counsel for Mr. Vierra along with then District General Counsel Hynes). The District did not step forward and have either Mr. Colantuono or its new General Counsel Nicholls appear for Mr. Vierra or seek a Court Order that he be dismissed from the Section 1090 Cause of Action under the One Final Judgment Rule or other grounds the District had identified. Furthermore, counsel for the plaintiff in the *Holloway* Lawsuit has from the time of the remand made it clear the plaintiff intended to prosecute this Section 1090 Cause of Action against Mr. Vierra, and indeed has done now so by filing a Motion for Summary Judgment against him on December 21, 2018. On January 18, 2019 at 6:09 p.m., the District notified Mr. Vierra's counsel that on January 17, 2019 the District "Board took action to formally stop any further defense of … Terry Vierra … in connection with the Holloway Lawsuit."

As a result of the District's January 17, 2019 action, the District is liable for Mr. Vierra's damages and other losses or expenses from and after the April 5, 2018 Court of Appeal Opinion reversing the decision of the Trial Court regarding the Section 1090 Cause of Action and remanding the Section 1090 Cause of Action to the Trial Court for further proceedings. The District's liability includes, but is not limited to:

(1) indemnification against any judgment or attorney's fees award resulting from the Holloway Lawsuit;
(2) payment of all past and ongoing legal fees, costs, and expenses incurred by Mr. Vierra for, including but not limited to, the following:
    (a) efforts to obtain District representation or funding for his defense in the remanded Section 1090 Cause of Action, including but not limited to a motion for dismissal based on the One Final Judgment Rule or other grounds, opposition to Mr. Holloway's Motion for Summary Judgment, and other defense activities;
    (b) preparation and filing of this Claim, and, if necessary, pursuing this Claim in court; and
    (c) seeking and retaining other counsel to represent him in defending against the remanded Section 1090 Cause of Action and compensating his retained counsel for such defense work.

The District Has a Mandatory Duty to Represent, Defend and Indemnify Mr. Vierra

Government Code section 825 establishes a mandatory duty for the District to represent, defend, and indemnify its employees, which includes Board members and former Board members sued for actions within the scope of their services as Board members (such as voting on the monthly list of District bills). Section 825 requires such representation and indemnification where:

(1) "an employee[3] or former employee of a public entity;"
(2) "requests the public entity to defend him or her against any claim or action against him or her;"
(3) "for an injury arising out of an act or omission occurring within the scope of his or her employment as an employee of the public entity;"
(4) "the request is made in writing no less than 10 days before the day of trial;" and

[3] *See* footnote 1, above.

(5) "the employee or former employee reasonably cooperates in good faith in the defense." (Gov. Code § 825(a)).

If each of the above elements is met, the public entity has a mandatory duty to defend its employee or former employee, and "the public entity shall pay any judgment" in relation to the matter for which the employee or former employee has sought defense. (Gov. Code § 825(a)).

Government Code sections 995 and 996.4 place a similar duty on a public entity to defend, or alternatively pay for the defense of, an employee or former employee:

> upon request of an employee[4] 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.

Section 996.4 provides that, in instances where (a) a public entity has a duty to defend its employee or former employee, (b) the public entity refuses to directly defend the employee or former employee, and (c) the employee or former employee retains his or her own counsel, then the employee or former employee becomes "entitled to recover from the public entity such reasonable attorney's fees, costs and expenses as are necessarily incurred by him [or her] in defending the action or proceeding . . .."

Here, on December 15, 2014, Mr. Vierra requested that the District defend him in the *Holloway* Lawsuit. On December 18, 2014, the Board voted to "defend . . . former Board Director Mr. Vierra in this [Lawsuit]." In committing to defend Mr. Vierra, the District found that all requirements of Section 825(a) were met.[5] Because all Section 825 elements were met, this triggered the mandatory duty of the District to defend and indemnify Mr. Vierra, which the District rightfully assumed and cannot now rescind.

The District's refusal to defend and indemnify Mr. Vierra, who served as a District Board member for over 24 years, runs directly counter to the purpose of Sections 825 and 995, to

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[4] See footnote 1, above.

[5] First, as a Board member, Mr. Vierra was an "employee" at the time the alleged misconduct took place. Second, the allegedly improper vote occurred during a duly noticed and agendized meeting, an act that fits squarely within Mr. Vierra's scope of employment as a Board member. Third, Mr. Vierra requested District representation on December 15, 2014, nearly two years before the December 13, 2016 trial on the merits. Finally, Mr. Vierra cooperated in good faith throughout the litigation of the *Holloway* Lawsuit, a fact never disputed by the District.

"assur[e] the zealous execution of official duties by public employees" by "limiting the personal threat of suit or liability." *Johnson v. State of California* (1968) 69 Cal.2d 782, 792.

Very truly yours
WITTWER PARKIN LLP

Jonathan Wittwer

cc: Gina R. Nicholls, District Counsel
Brad Bening, Esq.
Client

Attachment:
April 3, 2017 San Lorenzo Valley Water District Special Board Meeting Minutes

SAN LORENZO VALLEY WATER DISTRICT
SPECIAL BOARD MEETING MINUTES
April 3, 2017
6:00 p.m.

CONVENE MEETING/ROLL CALL:

President Ratcliffe convened the meeting at 6:00 p.m.

Dirs. Hammer, Smallman, Baughman, Bruce and Ratcliffe were present. District Manager Lee, Director of Operations Rogers and District Counsel were also present.

Pres. Ratcliffe described the Closed Session item.

Dist. Counsel Hynes stated a point of clarification.

ORAL COMMUNICATIONS:

J. Riley, Ben Lomond, A. Foster, Nancy, Felton, B. Hanson, Felton, N. Macy, Boulder Creek, L. Henry, Lompico, C. DeBert, Boulder Creek, N. Nicari, Ben Lomond, Cynthia, Ben Lomond, J Fasolas, Felton, R. Brown, Boulder Creek, Susan, Boulder Creek, Mr. Patterson, Scotts Valley, Robin, Felton, M. Messimer, M. Lee, Ben Lomond, B. Holloway, Boulder Creek, K. Brown, Boulder Creek, (unintelligible name), Ben Lomond, P. Lang, Boulder Creek, Helena, Scotts Valley, addressed the Board.

ADJOURNMENT TO CLOSED SESSION:

President Ratcliffe adjourned to closed session at 6:35 p.m.

RECONVENE TO OPEN SESSION:

Pres. Ratcliffe reconvened the meeting to open session at 7:55 p.m.

REPORT ACTIONS TAKEN IN CLOSED SESSION:

President Ratcliffe reported that the Board had voted to stop all financial commitment to the Political Reform Act case. The motion was passed unanimously.

ADJOURNMENT:

President Ratcliffe adjourned the meeting at 7:58 p.m.

LAFCO

NOTICE OF PUBLIC HEARING
LOCAL AGENCY FORMATION COMMISSION

NOTICE IS HEREBY GIVEN that at 10:00 a.m., Wednesday, March 6, 2019, in Room 525 of the County Governmental Center, 701 Ocean Street, Santa Cruz, the Santa Cruz Local Agency Formation Commission (LAFCO) will hold a public hearing on the following matter:

---Adoption of a Proposed Budget for the Fiscal Year Beginning July 1, 2019

At the hearing, the Commission will consider oral or written comments from any interested person.

The written reports and further information can be obtained by contacting LAFCO's staff at 701 Ocean Street, Room 318-D, Santa Cruz CA 95060, (831) 454-2055, or from LAFCO's website at www.santacruzlafco.org.

LAFCO does not discriminate on the basis of disability, and no person shall, by reason of a disability, be denied the benefits of its services, programs or activities. The Commission meetings are held in an accessible facility. If you wish to attend this meeting and you will require special assistance in order to participate, please contact the LAFCO office at least 48 hours in advance of the meeting to make arrangements.

Patrick M. McCormick
Executive Officer
Date: February 8, 2019

RECEIVED
FEB 15 2019
SAN LORENZO VALLEY
WATER DISTRICT