Appendix A:
WWTP Supporting Information

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Wastewater Operator Certification's registered Contract Operators as of September 2024

Number	Contract Company	Address	City	State	Zip	Expiration	Phone number
CO-0005	Dudek & Associates, Inc.	605 3rd Street	Encinitas	CA	92024	08/21/2024	(760)942-5147
CO-0006	The Sea Ranch Water Company	PO Box 16	The Sea Ranch	CA	95497	6/30/2025	(707)785-2411
CO-0009	Bracewell Engineering, Inc.	155 Mast St. #114	Morgan Hill	CA	95037	7/31/2025	(510)435-7521
CO-0010	Veolia Water North America - West LLC	10000 NE 7th Ave. Suite 225	Vancouver	WA	98685	7/31/2025	(360)975-6352
CO-0011	Operations Mgmt. International, Inc. (aka Jacobs Engineering)	PO Box 221	Parma	ID	83660	1/31/2023	(209)985-1071
CO-0012	California Water Services	PO Box 343	Coalinga	CA	93210	7/31/2025	(559)935-2300
CO-00198	Russian River Utility	PO Box 730	Forestville	CA	95436	8/31/2023	(707)887-7735
CO-0021	Natural Systems Utilities-CA, Inc.	1070 Horizon Drive, Ste A	Napa	CA	94558	8/31/2024	(707)254-1931
CO-0033	Water Quality Specialists	511 Venture Street	Escondido	CA	92029	3/31/2025	(760)745-2228
CO-0040	PACE Engineering	5155 Venture Parkway	Redding	CA	96002	3/31/2025	(530)355-9612
CO-0058	INFRAMARK, LLC	2002 West Grand Pkwy N Suite 100	Katy	TX	77449	8/31/2024	(281)579-4500
CO-0060	Waterworks Technology	2415 South Westboro Avenue	Alhambra	CA	91803	11/30/2024	(909)239-0087
CO-0064	System Operation Services, Inc.	200 Martinique Ave	Tiburon	CA	94920	5/31/2025	(800)699-7674
CO-0068	Fluid Resource Management	2385 Precision Drive	Arroyo Grande	CA	93420	6/30/2025	(805)597-7100
CO-0075	Gualala Community Services District	PO Box 124	Gualala	CA	95445	09/20/2025	(707)785-2331
CO-0078	Granger Water Specialties	105 S. Douty Street	Hanford	CA	93230	8/31/2025	(559)587-3080
CO-0079	Carmel Lahaina Utility Services, Inc.	PO Box 6	Carmel Valley	CA	93924	6/30/2025	(831)659-3595
CO-0083	Integrated Performance Consultants, Inc.	9297 Research Drive	Irvine	CA	92618	10/31/2022	(949)472-0160
CO-0088	Aquality Water Management	1900 Terracina Drive, Suite 110	Sacramento	CA	95834	7/31/2025	(916)544-5120
CO-0095	Stantec Consulting Services, Inc.	PO Box 1050	Lincoln	CA	95648	4/30/2025	(925)209-4017
CO-0099	Ventura Regional Sanitation District	1001 Partridge Drive, Suite 150	Ventura	CA	93003	11/30/2024	(805)658-4648
CO-0102	Montrose Water and Sustainability Services, Inc.	1 Park Plaza, Ste 1000	Irvine	CA	92614	5/31/2024	(609)605-0017
CO-0105	Ralph Gutierrez Water Service	304 Beverly Pl.	Exeter	CA	93221	8/31/2025	(559)592-5313
CO-0106	California Water Service	1720 North First St.	San Jose	CA	95112	10/02/2025	(325)430-7946

Wastewater Operator Certification's registered Contract Operators as of September 2024

CO-0113	Encina Wastewater Authority	6200 Avenida Encinas	Carlsbad	CA	92009	6/30/2025	(760)438-3941
CO-0115	Perc Water Corporation	17520 Newhope St. Ste 180	Fountain Valley	CA	92708	3/31/2025	(714)352-7766
CO-0119	Grace Environmental Services, LLC	2060-D E. Avenida De Los Arboles #327	Thousand Oaks	CA	91362	8/31/2025	(805)431-6253
CO-0133	Black Gold Industries	527 N. Rice Avenue	Oxnard	CA	93030	2/28/2024	(805)981-4616
CO-0150	Quality Service, Inc.	2996 McHenry Avenue	Escalon	CA	95320	12/31/2024	(209)838-7842
CO-0151	Apex Companies, LLC	6815 Flanders Drive, Suite 155	San Diego	CA	92121	12/31/2024	(858)558-1120
CO-0152	Woodard & Curran, Inc.	14343 Civic Drive	Victorville	CA	92392	2/28/2025	(760)963-6322
CO-0153	Americans Reach Out Utilities Service LLC	2430 Black Tern Way	Elk Grove	CA	95757	2/28/2024	(916)524-4560
CO-0155	ELM Water Specialist/ Edwin L. Mathis	35341 77th Street East	Littlerock	CA	93543	2/28/2025	(661)478-1295
CO-0158	Valley Operators LLC	1211 Como Drive	Manteca	CA	95337	6/30/2025	(209)483-5525
CO-0161	H2O Innovation	7220 S. Cimmarron Rd. Ste. 110	Las Vegas	NV	89113	7/31/2023	(702)722-6711
CO-0162	Edward C. Anderson-Alexandre	76345 Interlake Road	Bradley	CA	93426	5/31/2024	(831)262-9073
CO-0170	Wastewater Management Consultants of Fresno	6948 S. Maple Avenue	Fresno	CA	93725	3/31/2025	(559)907-6101
CO-0192	Specialized Utility Services Program	1234 North Market Blvd	Sacramento	CA	95834	5/31/2025	(916)553-4900
CO-0193	Aqua Operations, Inc.	P.O. Box 13305	Los Angeles	CA	90013	1/31/2025	(661)238-9805
CO-0198	Ralph Emerson	PO Box 108	Murphys	CA	95247	9/30/2024	(209)743-0125
CO-0201	EUSI, LLC	4501 W. Tierra Buena Ln.	Glendale	AZ	85306	1/31/2025	(602)300-7946
CO-0203	Hector Munoz	254 Gillett Rd.	El Centro	CA	92243	2/28/2025	(760)604-6562
CO-0205	JSWWC Water & Wastewater Management	PO Box 1063	Denair	CA	95316	12/31/2024	(209)620-1662
CO-0209	Choice Water Solutions	8424 Santa Monica Blvd, #291	West Hollywood	CA	90069	9/30/2025	(760)427-0603
CO-0210	D2 Environmental LLC	30 Ventura St.	Half Moon Bay	CA	94019	7/31/2025	(925)899-7668
CO-0215	WW Enterprise	PO Box 292527	Phelan	CA	92329	1/31/2025	(760)964-1033
CO-0216	DownStream Services, Inc.	2855 Progress Place	Escondido	CA	92029	2/28/2024	(760)746-2544
CO-0220	Fisher's Wastewater Service	13036 Capitol Drive.	Grass Valley	CA	95945	10/31/2024	(530)263-7241
CO-0221	Heritage Systems Inc.	2471 Solano Ave. Suite 141	Napa	CA	94558	11/30/2024	(707)258-0553

Wastewater Operator Certification's registered Contract Operators as of September 2024

CO-0222	Thomas R. Adcock Wastewater Operations	PO Box 9411	Salinas	CA	93915	1/31/2023	(831)269-3779
CO-0225	Central Cal Waterworks, Inc.	PO Box 1088	Auberry	CA	93602	6/30/2025	(559)575-5627
CO-0227	Cranmer Engineering, Inc.	PO Box 1240	Grass Valley	CA	95945	6/30/2025	(530)913-2866
CO-0230	Mountain Valley Environmental Services Inc.	1050 Ben Hur Road	Raymond	CA	93653	10/31/2024	(209)742-2626
CO-0231	Rodriguez Consulting	42206 Rd. 64	Dinuba	CA	93618	11/30/2024	(559)575-5627
CO-0232	Akima Support Operations, LLC	PO Box 960001	Tracy	CA	95296	2/28/2024	(209)839-5493
CO-0237	Sunset Services	61 Beacham Loop	Chico	CA	95973	3/31/2025	(530)519-1890
CO-0239	WaterTalent, LLC	15233 Ventura Blvd., Ste 615	Sherman Oaks	CA	91403	4/30/2024	(424)832-7217
CO-0240	Kevin Timms	5666 Oakwood Dr	Marysville	CA	95901	10/6/2025	(530)870-2471
CO-0242	Ryan Smith Consulting	19089 Railroad Ave.	Sonoma	CA	95476	2/28/2025	(707)559-0459
CO-0244	McMillan Mtn Services	PO Box 5	Big Creek	CA	93605	7/31/2023	(559)500-4199
CO-0251	IV Water Specialists	2402 S. Cypress Dr.	El Centro	CA	92243	05/31/2025	(760)592-4720
CO-0253	Utility Capital Solutions, LLC	3596 Emereff Lane	Valley Springs	CA	95252	6/30/2025	(510)427-5547
CO-0254	Lipski Water Services	3181 Eagle Lake Court	Chico	CA	95973	8/31/2025	(530)520-4776
CO-0255	H2O Urban Solutions	PO Box 551310	South Lake Tahoe	CA	96155	7/11/2024	916-869-4957
CO-0256	Invirotreat, Inc.	PO Box 3970	Fullerton	CA	92834	11/30/2024	(714)745-4692
CO-0257	James Joseph Peacher	PO Box 452	Springville	CA	93265	11/30/2024	(559)361-8191
CO-0258	SPB Utility Services, Inc.	430 Stoker Ave. #207	Reno	NV	89503	1/31/2024	(775)329-7757
CO-0259	KJS Support Services, JV, LLC	2200 Bennette Rd, Bldg 145	El Centro	CA	92243	1/31/2025	(760)339-2230
CO-0260	Sunik, LLC	PO Box 555	French Camp	CA	95231	2/28/2025	(209)234-1809
CO-0261	Mark Timmerman Operation Services	36417 Orange Grove Ave.	Madera	CA	93636	2/28/2025	(559)310-8924
CO-0262	Operational Technical Services, LLC	10250 Constellation Blvd., #100	Los Angeles	CA	90067	3/31/2025	(424)203-6352
CO-0263	Pinnacle Asset Integrity Services, LLC	PO Box 1031	Lincoln	CA	95648	1/31/2025	(530)798-6064
CO-0264	The Wastewater Guys LLC	34645 Bella Vista Drive	Yucaipa	CA	92399	3/31/2025	(760)791-2663
CO-0265	Jeffrey A. Nield	105 Glenn St.	Alturas	CA	96101	3/31/2024	(530)227-6496

Wastewater Operator Certification's registered Contract Operators as of September 2024

CO-0266	Coleman Engineering, Inc.	1223 Pleasant Grove Blvd. Suite 100	Roseville	CA	95678	12/31/2023	(916)847-3476
CO-0267	Thomas Hayes	PO Box 97	San Andreas	CA	95249	01/31/2025	(209)743-2502
CO-0268	Gouveia Engineering	456 6th Street	Gustine	CA	95322	04/30/2023	(209)854-7133
CO-0269	Curt Farrell	4464 Usona Road	Mariposa	CA	95338	05/31/2024	(209)628-6605
CO-0270	Johnny Price	231 N. Hamlin Rd.	Tipton	CA	93272	05/31/2023	(559)864-4048
CO-0271	Napa Sanitation District	1515 Soscol Ferry Rd.	Napa	CA	94558	05/31/2025	(559)864-4048
CO-0272	NVIRO	636 Clarion Court	San Luis Obispo	CA	93401	05/31/2024	(805)801-4065
CO-0273	CTR Water	5018 Saint Rita Pl.	San Diego	CA	92113	05/31/2025	(820)666-3575
CO-0274	City of Lompoc	100 Civic Center	Lompoc	CA	93438	07/31/2025	(805)875-8402
CO-0275	Austin Mederios	19513 Anna Rd.	Anderson	CA	96007	11/30/2023	(530)965-6429
CO-0276	Michael T. Thornton	2695 Manchester Ave.	Cardiff by the Sea	CA	92007	03/01/2025	760-753-6203 ext. 70
CO-0279	WaterStone Services	14063 Morning Glory Place.	Chico	CA	95973	08/24/2025	530-518-6861
CO-0283	Calaveras County Fairgrounds	PO Box 184	Mountain Ranch	CA	95246	03/07/2025	209-256-9827
CO-0284	Coleman Valley Water Company	PO Box 284	Windsor	CA	95492	03/27/2025	707-799-8052
CO-0287	Sierra Water Core	P.O. Box 684	Loyalton	CA	96118	09/16/2024	530-251-3351

Educational and Experiences Requirement Required for Certification of the Chief Plant Operator

Path	Education Requirements	Experience Requirements
GRADE 2		
1	High school diploma or equivalent and 9 educational points	18 months of full-time qualifying experience as a Grade I operator
2	High school diploma or equivalent and 12 educational points	2 years of full-time qualifying experience
3	Associate's degree, a higher degree, or a minimum of 60 college semester units, including a minimum of 15 semester units of science courses	1 year of full-time qualifying experience
GRADE 3		
1	High school diploma or equivalent and 12 educational points	3 years of full-time qualifying experience as a Grade II operator
2	High school diploma or equivalent and 18 educational points	4 years of full-time qualifying experience
3	Associate's degree or a minimum of 60 college semester units, including a minimum of 15 semester units of science courses	2 years of full-time qualifying experience
4	Bachelor's degree or a higher degree, including a minimum of 30 semester units of science courses	1 year of full-time qualifying experience

STATE WATER RESOURCES CONTROL BOARD
ORDER WQ 2016-0068-DDW

WATER RECLAMATION REQUIREMENTS
FOR RECYCLED WATER USE

Adoption Date

June 7, 2016

CALIFORNIA
Water Boards

STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

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ACRONYMS AND ABBREVIATIONS	
AGR	Agricultural supply
Antidegradation Policy	State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California
AQUA	Aquaculture
Basin Plan	Water Quality Control Plan
BPTC	Best practicable treatment or control
CDPH	California Department of Public Health
CEC	Contaminants of Emerging Concern
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
DBP	Disinfection By-products
Delta	Sacramento-San Joaquin River Delta Estuary
DDW	Division of Drinking Water
DWR	Department of Water Resources
E. coli	Escherichia coli
e.g.	Latin *exempli gratia* (for example)
FRESH	Fresh water replenishment
gpd	gallons per day
GWR	Groundwater recharge
IND	Industrial service supply
mg/L	Milligrams per liter
MPN	Most Probable Number
MRP	Monitoring and Reporting Program
MUN	Municipal supply
MOA	Memorandum of Agreement
NOA	Notice of Applicability
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
pdf	Portable Document Format
PROC	Industrial process supply
REC-1	Water contact recreation
Regional Water Board	Regional Water Quality Control Board
State Water Board	State Water Resources Control Board
TBD	To Be Determined
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
Water Boards	State Water Board and Regional Water Boards
WILD	Wildlife habitat
WDRs	Waste Discharge Requirements
WRRs	Water Reclamation Requirements

STATE WATER RESOURCES CONTROL BOARD
ORDER WQ 2016-0068-DDW
WATER RECLAMATION REQUIREMENTS
FOR RECYCLED WATER USE

FINDINGS:

The State Water Resources Control Board (State Water Board) finds that:

BACKGROUND INFORMATION

1. On January 17, 2014, California's Governor proclaimed a Drought State of Emergency and directed state officials to take all necessary actions to prepare for drought conditions. On March 1, 2014, the Governor signed bipartisan drought relief legislation, Senate Bill (SB) 103 and 104, modifying the Budget Act of 2013 (Stats. 2013, ch. 20 and 354) to provide additional funds for drought relief. (Stats. 2014, ch. 2 and 3, respectively).

2. On April 25, 2014, the Governor proclaimed a continued State of Emergency due to severe drought conditions and directed the State Water Board to "adopt statewide general waste discharge requirements to facilitate the use of treated wastewater that meets standards set by the California Department of Public Health (CDPH) in order to reduce demand on potable water supplies."

3. California experiences frequent drought conditions. The recent emergency actions follow a similar Declaration of Statewide Drought in effect from 2008 through 2011 (Executive Order S-06-08) and Drought Declaration State of Emergency in effect from 2009 through 2011 (Executive Order S-11-09). Drought conditions in California also persisted from 1987 through 1992. Paleoclimatologists have reconstructed medieval climate episodes from tree ring studies, sediment deposition, and other sources. These studies show that the most severe droughts during the past 1,000 years have lasted from 20 to more than 150 years.[1]

4. On June 3, 2014, the State Water Board adopted Water Quality Order 2014-0090-DWQ, *General Waste Discharge Requirements for Recycled Water Use* to streamline permitting of recycled water use statewide.

5. Order WQ 2014-0090-DWQ was adopted to facilitate recycled water use and reduce demand on potable water supplies; this General Order further encourages recycled water projects by (1) maintaining the streamlined approach in permitting new Users through a water recycling program and (2) providing the option for a single recycled water use permit coverage for larger Users that typically need permit coverage from multiple Regional Water Boards. Enrollees issued a Notice of Applicability (NOA) under order WQ 2014-0090-DWQ must

1 Michael Dettinger, *Droughts, Epic Droughts and Droughty Centuries—Lessons from California's Paleoclimatic Record: A PACLIM 2001 Meeting Report*, (Summer 2001) Interagency Ecological Program Newsletter, at p. 50.

notify the State Water Board of its intention to be regulated under this General Order.

6. Prior to July 1, 2014, CDPH provided public health recommendations to the Water Boards through review and approval of Title 22 Engineering Reports prepared pursuant to California Code of Regulations, title 22, section 60323. The Water Boards then issue permits. Effective July 1, 2014, the administration of the Drinking Water Program, including responsibility for review of Title 22 Engineering Reports was transferred from the CDPH to the State Water Board.

7. "Recycled water" means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource. (Wat. Code, § 13050(n).) Coverage under these Water Reclamation Requirements (WRRs) for Recycled Water Use (General Order) is limited to treated municipal wastewater for uses consistent with the Uniform Statewide Recycling Criteria, and other uses approved by the State Water Board on a case-by-case basis, other than direct or indirect potable uses. An estimated 1.85 to 2.25 million acre-feet of water supply could be realized annually though recycling by the year 2030.[2] Of this total amount, an estimated 0.9 million to 1.4 million acre-feet of recycled water could be realized through recycling of municipal wastewater that is discharged into the ocean or saline bays. Downstream beneficial uses will be protected by requiring compliance with Water Code section 1211, as described in the Antidegradation Analysis section of this General Order.

8. Recycled water use can help to reduce local water scarcity. It is not the only option for bringing supply and demand into a better balance, but it is a viable cost effective solution that is appropriate in many cases. The feasibility of recycled water use depends on local circumstances, which affect the balance of costs and benefits. In drought conditions, recycled water can be particularly valuable, given the scarcity of alternative supplies. In normal precipitation years recycled water use may reduce groundwater extraction.

9. The California Legislature has declared that a substantial portion of the future water requirements of the state may be economically met by beneficial use of recycled water. (Wat. Code, § 13511.) The Legislature also expressed its intent that the state undertakes all possible steps to encourage development of water recycling facilities so that recycled water may be made available to help meet the growing water requirements of the state. (Wat. Code, § 13512.)

10. On February 3, 2009, the State Water Board adopted Resolution 2009-0011, Adoption of a Policy for Water Quality Control for Recycled Water (Recycled Water Policy) (Revised January 22, 2013, effective April 25, 2013.) The

2 California Department of Water Resources, Bulletin 160-2009, p. 11-9.

Recycled Water Policy promotes the use of recycled water to achieve sustainable local water supplies and reduce greenhouse gas emissions.

11. Water recycling is an essential part of an overall program to manage local and regional water resources. Many local governing bodies have adopted resolutions establishing their intent to proceed with planning, permitting, and implementation of recycled water projects. These projects will provide water supply and municipal wastewater disposal benefits for communities, and will provide water supply benefits to agriculture.

12. The Uniform Statewide Recycling Criteria was established for the protection of public health and are codified in the California Code of Regulations, title 22, division 4, chapter 3 (herein referred to as Uniform Statewide Recycling Criteria). Approved uses of recycled water under the Uniform Statewide Recycling Criteria depend on the level of treatment and potential for public contact. Under the Uniform Statewide Recycling Criteria, recycled water is categorized based on treatment levels. There are four categories of recycled water relevant to this General Order; they are listed here and defined in the indicated regulations section:

    a. Undisinfected secondary recycled water (Cal. Code Regs., tit. 22, § 60301.900.)

    b. Disinfected secondary-23 recycled water (Cal. Code Regs., tit. 22, § 60301.225.)

    c. Disinfected secondary-2.2 recycled water (Cal. Code Regs., tit. 22, § 60301.220.)

    d. Disinfected tertiary recycled water (Cal. Code Regs., tit. 22, § 60301.230.)

    An approved Title 22 Engineering Report addressing protection of public health is required before authorization to use recycled water is granted by the Regional Water Board Executive Officer.

13. When used in compliance with the Recycled Water Policy, the Uniform Statewide Recycling Criteria , and all applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to raw and potable water supplies for approved uses.

14. This General Order authorizes beneficial, non-potable recycled water uses consistent with the Uniform Statewide Recycling Criteria and any additional requirements specified in the Notice of Applicability. Activities that are not authorized by this Order include:

a. Activities designed to replenish groundwater resources. Groundwater replenishment activities include surface spreading basins, percolation ponds, or injection through groundwater wells[3].

b. Disposal of treated wastewater by means of percolation ponds, excessive hydraulic loading of recycled water in use areas, etc., where the primary purpose of the activity is disposal of treated wastewater.

c. Direct potable reuse (Wat. Code, § 13561(b)), indirect potable reuse for groundwater recharge (Wat. Code, § 13561(c)), or surface water augmentation (Wat. Code, § 13561(d)).

15. There are many sources of salts and nutrients in surface and groundwater, including water soluble inorganic and organic constituents in imported water, leaching of naturally occurring salts in soils as a result of irrigation and precipitation, animal wastes, fertilizers and other soil amendments, municipal use including water softeners, industrial wastewater, and oil field wastewater. In coastal areas and areas adjacent to the Sacramento-San Joaquin Delta, seawater intrusion is also a source of salinity in groundwater, particularly in over-drafted basins. Imported water is a major source of salt. In water year 2010, 45 percent of the surface water used in the San Joaquin Valley was imported from the Sacramento-San Joaquin Delta through the Delta Mendota Canal, Folsom South Canal, and California Aqueduct (DWR).[4] In an average year, more than 800,000 tons of salt are imported from the Sacramento-San Joaquin River Delta Estuary (Delta) into the northern portion of the San Joaquin Valley, and another two million tons of salt are imported into the Tulare Lake Basin.[5] Southern California also imports significant water supplies from the Delta. In addition, it imports 4.4 million acre-feet of water each year from the Colorado River. Colorado River water has, on average, twice the salinity of northern California water sources, and water imported from the Delta is blended with Colorado River supplies to control salinity. The use of recycled water for irrigation has the potential to increase salts and other constituents in groundwater, but is not expected to be a significant source of salt loading relative to other potential sources, particularly when recycled water is used in the same watershed in which it would otherwise be discharged. Basin-specific salt and nutrient management plans, however, will provide definitive information on where assimilative capacity is available.

3 Injection well is defined in Water Code 13051.

4 Water Recycling and Desalination Section, California Department of Water Resources.

5 Department of Water Resources, Water Facts-Salt Balance in the San Joaquin Valley <http://www.water.ca.gov/pubs/environment/salt_balance_in_the_san_joaquin_valley water facts_20_/water_facts_20.pdf>, accessed 3 April 2014.

16. Use of recycled water has the potential to increase nutrients in groundwater supplies. In order to minimize the nutrient loading, this Order requires that recycled water used for irrigation purposes be applied at agronomic rates.

17. The Recycled Water Policy calls on local water and wastewater entities together with other stakeholders who contribute salt and nutrients to a groundwater basin or sub-basin, to fund and develop Salt and Nutrient Management Plans to comprehensively address all sources of salts and nutrients. The State Water Board herein reasserts the need for comprehensive salt and nutrient management planning and directs that salinity and nutrient increases should be managed in a manner consistent with the Recycled Water Policy. It is the intent of the Recycled Water Policy that every groundwater basin/sub-basin in California ultimately has a consistent Salt and Nutrient Management Plan. The appropriate way to address salt and nutrient issues is through the development of regional or subregional Salt and Nutrient Management Plans.

18. The Recycled Water Policy includes monitoring requirements for Constituents of Emerging Concern[6] (CECs) for the use of recycled water for groundwater recharge by surface and subsurface application methods. The monitoring requirements and criteria for evaluating monitoring results in the Recycled Water Policy are based on recommendations from a Science Advisory Panel.[7] Because this General Order is limited to non-potable uses and does not authorize groundwater replenishment activities, monitoring for CECs is not required.

19. The Recycled Water Policy requires permits for landscape irrigation with recycled water to include priority pollutant monitoring at the recycled water production facility. Annual monitoring is required for design production flows greater than one million gallons per day; a five year monitoring frequency is required for flows less than one million gallons per day. Priority pollutants are listed in Appendix A of 40 Code of Federal Regulations (CFR) Part 423.

STATUTORY AND REGULATORY ISSUES

20. Pursuant to Water Code section 13523, the Regional Water Board, after consulting with and receiving the recommendation of the State Water Board, may prescribe water reclamation requirements for water that is used or proposed to be used as recycled water. The requirements shall be established in

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6 For this Policy, CECs are defined to be chemicals in personal care products, pharmaceuticals including antibiotics, antimicrobials; industrial, agricultural, and household chemicals; hormones; food additives; transformation products, inorganic constituents; and nanomaterials.

7 The Science Advisory Panel was convened in accordance with provision 10.b of the Recycled Water Policy. The panel's recommendations were presented in the report; *Monitoring Strategies for Chemicals of Emerging Concern (CECs) in Recycled Water - Recommendations of a Science Advisory Panel*, dated June 25, 2010.

conformance with the Uniform Statewide Recycling Criteria pursuant to Water Code section 13521. Pursuant to Water Code section 13523 (b), the requirements for use of recycled water not addressed by the Uniform Statewide Recycling Criteria will be considered on a case-by-case basis by Regional Water Boards, after consulting with and receiving the recommendations of the State Water Board. The State Water Board provides such recommendations through acceptance letters for Title 22 Engineering Reports. These recommendations become requirements of the Order when specified in the Notice of Applicability.

21. Pursuant to Water Code section 13528.5, the State Water Board may carry out duties and authority granted to a Regional Water Board pursuant to the Water Code, division 7, chapter 7, including the authority to prescribe water reclamation requirements pursuant to Water Code section 13523.

22. Pursuant to Water Code section 13241 and 13263, the State Water Board, in establishing the requirements contained herein, considered factors including, but not limited to, the following:

    a. Past, present, and probable future beneficial uses of water;

    b. Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;

    c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;

    d. Economic considerations;

    e. The need for developing housing within the region(s); and

    f. The need to develop and use recycled water.

23. Pursuant to Water Code section 106.5, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This General Order promotes that policy by encouraging uses of recycled water. Such uses must be consistent with the requirements of California Code of Regulations (including the Uniform Statewide Recycling Criteria). This General Order furthers the human right to water by encouraging use of recycled water thus reducing demand on other other sources, including use of potable water used for non-potable uses where recycled water is available.

24. Technical and monitoring reports specified in this General Order are required pursuant to Water Code section 13267. Failing to furnish the reports by the due date or falsifying information in the reports is a misdemeanor that may result in assessment of civil liabilities against the Discharger. Water Code section 13267 states, in part:

    "In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is

> suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. … (f) the State Board may carry out the authority granted to a regional board pursuant to this section."

The technical reports required by this General Order, the NOI, and the Monitoring and Reporting Program (MRP) are necessary to assure compliance with this General Order. The burden and cost of preparing the reports are reasonable and consistent with the best interest of the people of the state in maintaining water quality.

25. This General Order is applicable to recycled water projects where recycled water is used or transported for non-potable uses (for example: landscape irrigation, irrigation of crops and pasture land, construction, fire suppression, hydrostatic testing, etc.) This General Order does not regulate the treatment of wastewater. Compliance with this General Order does not relieve producers or distributors from the obligation to comply with applicable Waste Discharge Requirements (WDRs) for discharges from wastewater treatment plants, other than the recycled water uses described herein.

26. The uses of recycled water described in this General Order are exempt from the requirements of Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste in California Code of Regulations, title 27, division 2, subdivision 1, section 20005, et seq. The activities are exempt from the requirements of title 27 so long as the activity meets, and continues to meet, all preconditions listed below. (Cal Code Regs., tit. 27, § 20090.)

    a. Sewage—Discharges of domestic sewage or treated effluent which are regulated by WDRs issued pursuant to California Code of Regulations, title 23, division 3, chapter 9, or for which WDRs have been waived, and which are consistent with applicable water quality objectives, and treatment or storage facilities associated with municipal wastewater treatment plants, provided that residual sludge or solid waste from wastewater treatment facilities shall be discharged only in accordance with the applicable State Water Board promulgated provisions of this division. (Cal. Code Regs., tit. 27, § 20090(a).)

b. Wastewater—Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leach fields if the following conditions are met: (1) the applicable Regional Water Board has issued WDRs, reclamation requirements, or waived such issuance; (2) the discharge is in compliance with the applicable water quality control plan; and (3) the wastewater does not need to be managed according to, California Code of Regulations, title 22, division 4.5, chapter 11, as a hazardous waste. (Cal. Code Regs., tit. 27, § 20090(b).)

c. Reuse – Recycling of other use of materials salvaged from waste or produced by waste treatment, such as scrap metal, compost, and recycled chemicals, provided that discharges of residual wastes from recycling or treatment operations to land shall be according to applicable provisions of Title 27 regulations.(Cal. Code Regs., tit. 27, § 20090(h).)

ANTIDEGRADATION ANALYSIS

27. State Water Board Resolution No. 68-16, the *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (the Antidegradation Policy) requires that disposal of waste into the waters of the state be regulated to achieve the highest water quality consistent with the maximum benefit to the people of the state. The quality of some waters is higher than established by adopted policies and that higher quality water shall be maintained to the maximum extent possible consistent with the Antidegradation Policy. The Antidegradation Policy requires the following:

    a. Higher quality water will be maintained until it has been demonstrated to the state that any change will be consistent with the maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of the water, and will not result in water quality less than that prescribed in the policies.

    b. Any activity that produces a waste or may produce waste or increased volume or concentration of waste and discharges to existing high quality waters will be required to meet waste discharge requirements that will result in the best practicable treatment or control (BPTC) of the discharge necessary to assure pollution or nuisance will not occur, and the highest water quality consistent with the maximum benefit to the people of the state will be maintained.

28. This General Order regulates discharges to groundwater basins throughout the state. There is not sufficient data to determine which groundwater basins are high quality waters for the various constituents that may be associated with recycled water. To the extent use of recycled water may result in a discharge to a groundwater basin that contains high quality water, this General Order authorizes limited degradation consistent with the Antidegradation Policy as described in the findings below. Further, Salt and Nutrient Management Plans,

developed in accordance with the Recycled Water Policy, will require analysis on an ongoing basis to evaluate inputs to the basin, the salt and nutrient mass balance, and the available assimilative capacity.

29. This General Order requires BPTC, which is a combination of treatment, storage, and application methods that implement the requirements of the Uniform Statewide Recycling Criteria and the Regional Water Board Water Quality Control Plans (Basin Plans). Recycled water is generated by treating (primarily) domestic wastewater adequately to make the water suitable for a direct beneficial use that would not otherwise occur. The required level of treatment corresponds to the proposed use of the recycled water. In addition, this General Order includes requirements regarding the storage and application of recycled water to protect water quality and limit public contact to recycled water, where appropriate. Wastewater treatment can be accomplished many different ways, but generally consists of physical, chemical, and/or biological methods. Depending upon the use of the recycled water, disinfection may be performed. In addition to the treatment processes, this General Order also requires the following control measures:

    a. Recycled water use shall not cause unacceptable groundwater and/or surface water degradation.

        i. Regional Water Boards have discretion regarding permitting storage of recycled water in unlined ponds. Applicants shall improve storage facilities if deemed necessary by a Regional Water Board.

        ii. Application of recycled water is limited to agronomic rates, which limits the potential for significant amounts of recycled water to impact groundwater quality and allows plants to take up wastewater constituents such as nitrogen compounds.

        iii. Recycled water use shall be controlled to prevent significant runoff from application areas. This General Order authorizes use of recycled water for application to land, where recycled water is further treated in natural soil processes.

    b. Recycled water shall not create nuisance conditions.

        i. The Uniform Statewide Recycling Criteria requires wastewater to be oxidized, which removes putrescible matter and requires dissolved oxygen. Maintaining dissolved oxygen in the wastewater will generally prevent nuisance odors.

        ii. Application of recycled water is controlled to prevent airborne spray from entering dwellings, eating areas, or food handling areas.

        iii. Application of recycled water to saturated soil is prohibited. Application to saturated soil reduces the soil treatment processes and may create conditions for mosquito breeding.

c. Recycled water shall only be used consistent with the Uniform Statewide Recycling Criteria and any other requirements specified in the Notice of Applicability.

i. A written approval of a Title 22 Engineering Report must be obtained from the State Water Board before a Notice of Applicability (NOA) can be issued.

ii. Uses of recycled water are subject to category-specific use area signage, and monitoring frequency requirements as specified in the Uniform Statewide Recycling Criteria. Uses not addressed by the Uniform Statewide Recycling Criteria will be considered on a case-by-case basis by Regional Water Boards , after consulting with and receiving the recommendations of the State Water Board. These recommendations become requirements of the Order when specified in the Notice of Applicability.

iii. Uses of recycled water are subject to backflow prevention, cross connection tests, and setback requirements for surface impoundments, wells, etc. as contained in the Uniform Statewide Recycling Criteria and California Code of Regulations, title 17, division 1, article 2.

30. In an arid climate, such as the climate that exists in most of California, the maximum benefit to the people of the state can only be achieved by ensuring long and short-term protection of economic opportunities, public health, and environmental protection. In order to do that, water uses must be better matched to water quality and use of local supplies must be encouraged to the extent possible, including reusing water that would otherwise flow to the ocean or other salt sinks without supporting beneficial uses during transmission. The use of recycled water in place of both raw and potable water supplies for the non-potable uses allowed under this General Order improves water supply availability and helps to ensure that higher quality water will continue to be available for human uses and for instream uses for fish and wildlife. It also reduces the need for groundwater pumping that has resulted in permanent loss of aquifer storage capacity and land subsidence in some parts of the state.

As required by the Antidegradation Policy, the State Water Board finds that the limited degradation of water that may occur as the result of recycling under the conditions of this General Order provides maximum benefit to the people of California, provided recycled water treatment and use are managed to ensure long-term reasonable protection of beneficial uses of waters of the state. Recycled water available for reuse under this General Order has been treated at a wastewater treatment plant to levels that comply with permits issued by the State Water Board or Regional Water Boards pursuant to the Clean Water Act for discharges to waters of the United States or the Porter Cologne Water Quality Control Act for discharges to land. Treatment technologies required under these

laws and permits include secondary and/or tertiary treatment and disinfection when needed for pathogen reduction.

The Uniform Statewide Recycling Criteria imposes limitations on the uses of recycled water, based on the level of treatment and the specific use in this General Order to protect public health. By restricting the use of recycled water to those meeting the Uniform Statewide Recycling Criteria, this General Order ensures that recycled water is used safely. To the extent that the use of recycled water may result in some waste constituents entering the environment after effective source control, treatment, and control measures are implemented, the conditions of this General Order limiting the use of recycled water to agronomic rates is part of the suite of treatment, storage and applications measures that comprise BPTC for uses with frequent or routine application, such as landscape or agricultural irrigation. Other types of uses that may be approved, such as dust control, firefighting, hydrostatic testing, and other short term or infrequent application are unlikely to result in sufficient loading of waste constituents that impact water quality.

31. Constituents associated with recycled water that have the potential to degrade groundwater include salinity, nutrients, pathogens (represented by coliform bacteria), disinfection by-products (DBPs), constituents of emerging concern (CECs), and endocrine disrupting chemicals (EDCs). If the discharge is not consistent with Basin Plan requirements, the applicant may elect to improve treatment to enroll under this General Order, or to apply for a site-specific order from the Regional Water Board. The State Water Board finds that the use of recycled water permitted under this General Order will not unreasonably affect beneficial uses or result in water quality that is less than that prescribed in applicable policies. The characteristics and requirements associated with each of the recycled water constituents of concern are discussed below:

    a. Salinity is measured in water through various measurements, including but not limited to, total dissolved solids (TDS) and electrical conductivity. Excessive salinity can impair the beneficial uses of water. Salinity levels in the receiving water can be affected by the use of recycled water if the recycled water has elevated concentrations of salinity. However, it is anticipated that in most cases, the use of recycled water for irrigation will consist of a portion of the total applied irrigation water. Other sources of irrigation water are likely to be potable water, imported water, agricultural water supply wells, irrigation districts (surface water supplies), and precipitation. The blending of sources of irrigation water (e.g. recycled water blended with stormwater) will generally reduce concentrations of, and/or loading rates of salinity constituents. As a result, salinity increases in use areas where the irrigation water is a blend of water sources are less likely to impair an existing and/or potential beneficial use of groundwater.

b. Nitrogen is a nutrient that may be present in recycled water at a concentration that can degrade groundwater quality. This General Order requires application of recycled water to take into consideration nutrient levels in recycled water and nutrient demand by plants. Application of recycled water at agronomic rates and considering soil, climate, and plant demand minimizes the movement of nutrients below the plants' root zone. When applied to cropped (or landscaped) land, some of the nitrogen in recycled water will be taken up by the plants, lost to the atmosphere through volatilization of ammonia or denitrification, or stored in the soil matrix. As a result, nitrogen increases are unlikely to impair an existing and/or potential beneficial use of groundwater.

c. Pathogens and other microorganisms may be present in recycled water based on the disinfection status. Coliform bacteria are used as a surrogate (indicator) because they are present in untreated wastewater, survive in the environment similar to pathogenic bacteria, and are easy to detect and quantify. Pathogens are generally limited in their mobility when applied to land.

   Setbacks from recycled water use areas are required in the Uniform Statewide Recycling Criteria as a means of reducing pathogenic risks by coupling pathogen inactivation rates with groundwater travel time to a domestic water supply well or other potential exposure route (e.g. water contact activities). In general, a substantial unsaturated zone reduces pathogen survival compared to saturated soil conditions. Fine grained soil particles (silt or clay) reduce the rate of groundwater transport and therefore are generally less likely to transport pathogens. Setbacks also provide attenuation of other recycled water constituents through physical, chemical, and biological processes.

   When needed, disinfection can be performed in a number of ways. The Uniform Statewide Recycling Criteria lists disinfection requirements for specifically listed activities.

d. Disinfection by-products (DBPs) consist of organic and inorganic substances produced by the interaction of chemical disinfectants with naturally occurring substances in the water source. Common disinfection by-products include trihalomethanes, haloacetic acids, bromate, and chlorite. DBPs present in recycled water receive additional treatment when applied to land. Biodegradation, adsorption, volatilization, and other attenuative processes that occur naturally in soil will reduce the concentrations and retard migration of DBPs in the subsurface.

e. Chemicals of Emerging Concern (CECs) in recycled water as they pertain to the State Water Board’s Recycled Water Policy are defined to be chemicals in personal care products, pharmaceuticals including antibiotics, antimicrobials; industrial, agricultural, and household chemicals; hormones;

food additives; transformation products, inorganic constituents; and nanomaterials. CECs are new classes of chemicals, diverse, and relatively unmonitored chemicals. Many of them are so new that standardized measurement methods and toxicological data for interpreting their potential human or ecosystem health effects are unavailable. The State Water Board convened a CEC Advisory Panel to address questions about regulating CECs with respect to the use of recycled water. The Panel's primary charge was to provide guidance for developing monitoring programs that assess potential CEC threats from various water recycling practices, including groundwater recharge/reuse and urban landscape irrigation. The Panel provided recommendations for monitoring specific CECs in recycled water used for groundwater recharge reuse. Monitoring of health-based CECs or performance indicator CECs is not required for recycled water used for landscape irrigation due to the low risk of ingestion of the water. These recommendations were made part of the Recycled Water Policy. This General Order does not provide coverage for groundwater recharge activities or production of recycled water.

f. Endocrine disrupting chemicals (EDCs) are mostly man-made, found in various materials such as pesticides, metals, additives, or contaminants in food, and personal care products. Human exposure to EDCs occurs via ingestion of food, dust and water, via inhalation of gases and particles in the air, and through the skin. Perchlorate is an EDC that may be present in hypochlorite solutions, which is a type of disinfectant used for wastewater. Formation of perchlorate in hypochlorite solution can be minimized when proper manufacturing, handling, and storage conditions are followed. Perchlorate accumulation has been documented in fruit and seed bearing crops and leafy vegetation irrigated with perchlorate contaminated water. Recycled water currently makes up less than one percent of California agricultural water supply. Much of the recycled water used for agricultural irrigation is either undisinfected or is disinfected by means that do not result in perchlorate generation, such as ultraviolet light and chlorine gas. Some sources of agricultural water supply in some areas of the state contain perchlorate, such as surface water from Colorado River or groundwater sources in areas near industrial or military application sites (e.g. Riverside, San Bernardino, and Los Angeles counties). The blending of sources of irrigation water will further reduce any concentration of perchlorate present in recycled water and will be unlikely to affect beneficial uses or degrade groundwater quality.

32. The use of recycled water that would otherwise be discharged to a watercourse can adversely affect the availability of water for beneficial uses of water downstream of the discharge point, including in-stream uses. Water Code section 1211 requires that: (1) the owner of any wastewater treatment plant obtain the approval of the State Water Board before making any change in the

point of discharge, place of use, or purpose of use of treated wastewater where changes to the discharge or use of treated wastewater have the potential to decrease the flow in any portion of a watercourse, and (2) the State Water Board review the proposed changes pursuant to the provisions of Water Code section 1700 *et seq*. In order to approve the proposed change, the State Water Board must determine that the proposed change will not operate to the injury of any legal user of the water involved. (Wat. Code, §1702.) The State Water Board also has an independent obligation to consider the effect of the proposed change on public trust resources and beneficial uses established for areas downstream of the discharge point, and to protect those resources where feasible. (*National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419 [189 Cal. Rptr. 346].)

33. This General Order authorizes uses of recycled water statewide. If an existing or proposed use of recycled water seeking coverage under this General Order could result in water quality degradation as described below, the Regional Water Board's Executive Officer shall notify the applicant/discharger of the need to either revise the proposed/existing project, or apply for or continue coverage under a site-specific order of the Regional Water Board. The Regional Water Board's Executive Officer or the State Water Board's Executive Director (or designee) shall explain the need for a revised project, design, operation, or coverage under a different order, by making one or more of the following findings in the NOI response letter:

    a. The proposed use of recycled water is not consistent with Findings 27 through 32 of this General Order, which collectively provide for compliance with antidegradation findings for projects covered by this General Order. The degradation may be from salinity, nitrogen compounds, pathogens, disinfection by-products, or other substances.

    b. The proposed method of recycled water storage in unlined ponds is not consistent with Findings 27 through 32 of this General Order, which collectively provide for compliance with antidegradation findings for projects covered by this General Order. The degradation may be from salinity, nitrogen compounds, pathogens, disinfection by-products, or other substances.

    c. The proposed use of recycled water or method of recycled water storage will cause or contribute to pollution or nuisance, or otherwise fail to comply with the applicable Basin Plan or State Water Board plans or policies.

    d. The proposed use of recycled water does not implement mitigation measures in a California Environmental Quality Act (CEQA) document.

    e. The proposed use of recycled water is not consistent with a Total Maximum Daily Load (TMDL) waste load or load allocation, or implementation plan as adopted by the Regional Water Board and made part of the Regional Water Board's Basin Plan.

f. The proposed use of recycled water is not consistent with the Basin Plan provisions for implementing a Salt and Nutrient Management Plan.

PURPOSE AND APPLICABILITY

34. The State Water Board recognizes the need for streamlined permitting consistent with the State Water Board's Recycled Water Policy. The State Water Board's intention in the issuance of this statewide order is to provide consistent regulation of non-potable uses of recycled water statewide. To provide such consistency, the State Water Board intends that regulatory coverage under an existing Regional Water Board general order or conditional waiver for non-potable uses of recycled water (landscape irrigation, golf course irrigation, dust control, street sweeping, etc.) will be terminated by the applicable Regional Water Board within three (3) years after adoption of this General Order. Enrollees covered by a Regional Water Board general order or conditional waiver for non-potable uses of recycled water may continue discharging under that authority until the applicable Regional Water Board issues a Notice of Applicability to an Administrator per the terms of this Order. Enrollees under Order WQ 2014-0090-DWQ will be transferred for coverage under this General Order.

35. This document serves as a statewide General Order authorizing the use of recycled water by Producers, Distributors, and Users for uses consistent with the Uniform Statewide Recycling Criteria, other than direct or indirect potable reuse. The intent of this General Order is to streamline the permitting process and delegate the responsibility of administrating water recycling programs to an Administrator to the fullest extent possible. The following may apply for coverage under this General Order and agree to become the Administrator:

    a. Producers of recycled water: Producers may be publicly or privately owned. A Producer will typically produce recycled water that meets the requirements of the Uniform Statewide Recycling Criteria. A Producer may also act as an Administrator.

    b. Distributors of recycled water: In some cases, a Distributor may provide additional treatment (such as disinfection) to meet the Uniform Statewide Recycling Criteria for its intended use, and distribute it to Users. A Distributor is not required to take physical possession of the recycled water and may act simply as an Administrator.

    c. Users of recycled water: Users take physical possession of the recycled water from Producers and/ or Distributors for an approved beneficial recycled water use consistent with Uniform Statewide Recycling Criteria. A User that takes physical possession of recycled water may act as an Administrator and distribute to other Users. Users of recycled water may also use the recycled water under a Water Recycling Use Permit from another Administrator.

d. A legal entity: A joint powers agreement or equivalent contractual agreement between a Producer, Distributor, irrigation district, or other entity. Similar to a Distributor, a legal entity is not required to take physical possession of the recycled water and may act simply as an Administrator.

36. To obtain coverage under this General Order, the applicant shall submit an NOI (Attachment A) and an application fee to the Regional Water Board of jurisdiction. An applicant proposing a water recycling program that covers recycled water use areas within multiple Regional Water Board jurisdictions may submit an NOI (Attachment A) and application fee to the State Water Board. Fee amounts are in accordance with California Code of Regulations, title 23, division 3, chapter 9, article 1. The applicant shall declare responsibility for the administration of the water recycling program authorized pursuant to this General Order. The applicant shall describe a program they will administer to ensure that recycled water use complies with the requirements of the Uniform Statewide Recycling Criteria, and this General Order. Upon authorization by the State or Regional Water Board, the applicant then becomes the Administrator. The Administrator shall be billed for an annual fee until coverage under the General Order is terminated.

37. Pursuant to Water Code section 13554.2, any person or entity proposing the use of recycled water shall reimburse the State Water Board for reasonable costs incurred in performing duties relevant to the implementation of regulatory oversight related to protection of public health for uses of recycled water.

38. This General Order does not authorize discharges of pollutants from point sources to water of the United States, thus the use of recycled water allowed pursuant to the terms of this General Order are not subject to National Pollutant Discharge Elimination System (NPDES) permits. To the extent that this General Order results in agricultural irrigation return flows entering waters of the United States, such return flows are not subject to NPDES permits (33 U.S.C., §1342(l)(1)) but may be subject to waste discharge requirements or conditional waivers as adopted by Regional Water Boards. Where such waste discharge requirements or conditional waivers exist, this General Order requires that uses of recycled water comply with their provisions.

39. The State Water Board recognizes the need to allow a centralized enrollment process under this General Order to facilitate opportunities for non-potable uses of recycled water by a single entity that may occur in more than one Regional Water Board jurisdictions (for example: hydrostatic testing of utility pipelines owned by a utility company or landscape irrigation at facilities managed by other state agencies). An NOI may be submitted to the State Water Board for such uses of recycled water, when managed by a single Administrator and subject to the corresponding recycled water quality, use area requirements, and reliability features.

40. Enrollment under this General Order may serve as additional authorization for new uses of recycled water presently not covered under existing WDRs, Master Reclamation Permits, or WRRs, as long as such new uses meet the requirements of this General Order and an approved Title 22 Engineering Report. A User that serves as an Administrator may use the additional authorization provided by this General Order to obtain recycled water from other Producers or Distributors permitted under other existing WDRs, Master Reclamation Permits, or WRRs.

41. Agricultural operations subject to waste discharge requirements or waivers of waste discharge requirements regulating discharges from irrigated lands may obtain authorization pursuant to this General Order to use recycled water for irrigation. Such authorization may take the form of a Water Recycling Use Permit from an Administrator covered by this General Order, or the agricultural operation may enroll as its own Administrator. The State Water Board recognizes the need to simplify regulation of recycled water use on agricultural lands. Pursuant to Water Code section 13267, Regional Water Boards' Executive Officers may modify the MRP to prevent duplication of monitoring and reporting activities that satisfy the requirements of both orders.

BASIN PLANS AND BENEFICIAL USES

42. Beneficial uses of groundwater are determined by each Regional Water Board and are listed in their respective Basin Plans. Beneficial uses for groundwater are: municipal supply (MUN), industrial service supply (IND), industrial process supply (PROC), fresh water replenishment (FRESH), aquaculture (AQUA), wildlife habitat (WILD), water contact recreation (REC-1), agricultural supply (AGR), and groundwater recharge (GWR). Some beneficial uses only apply to certain geographical areas within regions.

43. Basin Plans establish water quality objectives to protect beneficial uses. The water quality objectives may be narrative, numerical, or both. This General Order requires proposed recycled water uses to comply with Basin Plan requirements. Determination of compliance with the Basin Plan is part of the application process.

CEQA AND PUBLIC NOTICE

44. On April 25, 2014, the Governor issued an Executive Order declaring a continued state of emergency due to severe drought conditions. Directive No. 10 of the Executive Order directs the State Water Board to adopt statewide general waste discharge requirements to facilitate the use of treated wastewater that meets standards set by CDPH, in order to reduce demand on potable water supplies. Effective July 1, 2014 the authority to establish such standards was transferred from CDPH to the State Water Board. This General Order is intended to satisfy the Directive No. 10 requirement. Directive No. 19 of the Executive Order provides that the California Environmental Quality Act (CEQA)

requirement to conduct an environmental review is suspended to allow the State Water Board to adopt this General Order as quickly as possible.

45. On November 13, 2015, the Governor issued an Executive Order (B-36-15) extending suspension of Division 13 (commencing with section 21000) of the Public Resources Code and regulations adopted pursuant to that Division in the January 17, 2014 Proclamation, April 25, 2014 Proclamation, and Executive Orders B-26-14, B-28-14, and B-29-15. The suspension will remain in effect until the drought state of emergency is terminated. The suspension also applies to the adoption of water reclamation requirements by the State Water Board that serve the purpose of paragraph 10 of the April 25, 2014 Proclamation.
46. The State Water Board has notified interested agencies and persons of its intent to prescribe these WRRs, and has provided them the opportunity to attend a public meeting and to submit their written views and recommendations.
47. The State Water Board, in a public meeting, heard and considered all comments pertaining to this matter.

IT IS HEREBY ORDERED that Order WQ 2014-0090-DWQ is hereby rescinded except for enforcement purposes, effective 60 calendar days after adoption of this General Order ("Effective Date").

To enroll under this General Order, a prospective enrollee must file an NOI indicating its intention to be regulated under the provisions of this General Order, and receive authorization from the appropriate Regional Water Board. A prospective enrollee that intends to obtain authorization from multiple Regional Water Boards may file an NOI and receive authorization from the State Water Board.

To obtain coverage under this General Order, an enrollee under Order WQ 2014-0090-DWQ must notify the State Water Board of its intention to be regulated under this General Order. See Attachment A, "Who May Apply." Coverage will terminate on the Effective Date for any existing enrollee that fails to submit the required documentation.

Pursuant to Water Code sections 13263,13267, 13523 and 13523.1, enrollees under this Order, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, shall comply with the requirements in this Order.

A. PROHIBITIONS

1. The treatment, storage, distribution, or use of recycled water shall not cause or contribute to a condition of pollution as defined in Water Code section 13050(l) or nuisance as defined in Water Code section 13050(m).
2. Recycled water shall not be applied for irrigation during periods when soils are saturated.

3. Recycled water shall not be allowed to escape from the use area(s) as surface flow that would either pond and/or enter surface waters, unless authorized by WDRs, waivers of WDRs, or conditional prohibitions regulating agricultural discharges from irrigated lands.

4. Spray or runoff shall not enter a dwelling or food handling facility and shall not contact any drinking water fountain, unless specifically protected with a shielding device. If the recycled water is undisinfected secondary or disinfected secondary-23 quality then spray or runoff shall not enter any place where public access is not restricted during irrigation.

5. The incidental runoff of recycled water shall not result in water quality less than that prescribed in water quality control plans or policies unless authorized through time schedule provisions in WDRs, waivers of WDRs, or conditional prohibitions regulating agricultural discharges from irrigated lands.

   Recycled water shall not be discharged from treatment facilities, irrigation holding tanks, storage ponds, or other containment, other than for permitted use in accordance with this General Order; Regional Water Board issued WDRs, WRRs, or Master Reclamation Permits; NPDES permits; or a contingency plan in an approved Water Recycling Use Permit.

6. There shall be no cross-connection between potable water supply and piping containing recycled water. All Users of recycled water shall provide for appropriate backflow protection for potable water supplies as specified in California Code of Regulations, title 17, section 7604 or as determined by the State Water Board on a case-by-case basis to protect public health.

7. This General Order authorizes certain beneficial recycled water uses consistent with Uniform Statewide Recycling Criteria. The following activities are not authorized by this General Order:

   a. Activities designed to replenish groundwater resources. Groundwater replenishment activities include surface spreading basins, percolation ponds, or injection through groundwater wells.

   b. Disposal of treated wastewater by means of percolation ponds, excessive hydraulic loading of application areas, or any other method, where the primary purpose of the activity is the disposal of treated wastewater.

   c. Direct potable reuse (Wat. Code, § 13561(b)), indirect potable reuse for groundwater recharge (Wat. Code, § 13561(c)), or surface water augmentation (Wat. Code, § 13561(d)).

8. The use of recycled water in violation of the applicable Regional Water Board's Basin Plan is prohibited.

B. SPECIFICATIONS

1. Recycled water distribution and use permitted under this General Order shall be in compliance with all of the following requirements:

   a. Regulations related to recycled water (including its subsequent revisions) contained in California Code of Regulations, title 17, sections 7583 – 7586, sections 7601 – 7605, and California Code of Regulations, title 22, sections 60001 – 60355.

   b. All requirements of this General Order.

   c. An approved Title 22 Engineering Report that demonstrates or defines compliance with the Uniform Statewide Recycling criteria (and amendments).

   d. The NOA issued by the Regional Water Board or State Water Board.

   e. Applicable Salt and Nutrient Management Plan adopted by the Regional Water Board as a Basin Plan Amendment.

   f. WDRs or NPDES permits for recycled water production facilities, to the extent that the WDRs or NPDES permits include provisions that address recycled water.

   g. Any applicable water quality related CEQA mitigation measure.

   h. Water Code section 1211 for facilities where the changes to the discharge are necessary to accomplish water recycling and will result in changes in flow in a watercourse.

   i. Policy for Water Quality Control for Recycled Water (Recycled Water Policy)

2. The Administrator shall discontinue delivery of recycled water during any period in which it has a reason to believe that the quality of the delivered recycled water is not meeting the Uniform Statewide Recycling Criteria specification. The Administrator shall notify the Regional Water Board, and the State Water Board if it issued the NOA, within one (1) business day of determining that delivery of off-specification recycled water has taken place. In circumstances where the emergency requires termination of delivery to Users, the Regional Water Board, and the State Water Board if it issued the NOA, shall be copied on any correspondence concerning non-compliance between the Administrator and User. This notification does not supersede any notification requirements contained within a Producer's WDRs or Master Reclamation Permit for production facilities.

3. Uses of recycled water with frequent or routine application (for example: agricultural or landscape irrigation uses) shall be at agronomic rates and shall consider soil, climate, and plant demand. In addition, application of recycled water and use of fertilizers shall be at a rate that takes into consideration nutrient levels in recycled water and nutrient demand by plants. The State or Regional Water Board may require the Administrator to submit an Implementation or

Operations and Management Plan specifying agronomic rates and nutrient application for the use area(s) and a set of reasonably practicable measures to ensure compliance with this General Order. An Administrator may submit a nutrient management plan developed to comply with another Water Board's order, such as waste discharge requirements or a waiver regulating discharges from irrigated lands, in lieu of an Implementation or Operations and Management Plan. Other uses of recycled water that are infrequent (for example: dust control, firefighting, hydrostatic testing, etc.) must also be addressed by a set of reasonably practicable measures within an Implementation or Operations and Management Plan.

C. WATER RECYCLING ADMINISTRATION REQUIREMENTS

1. Applicants seeking coverage under this General Order shall submit an NOI in accordance with Attachment A. Responsibilities for an Administrator shall be described in the NOI.
2. Coverage under this General Order becomes effective when the State or Regional Water Board issues an NOA. The Regional Water Board and the State Water Board will coordinate to include Title 22 Engineering Report requirements and conditions of approval.
3. Under this General Order, the Administrator's program shall be implemented to accomplish compliance with Specification B.1. Upon State or Regional Water Board approval of the Administrator's program, which shall accompany the NOI, the Administrator may authorize and/or implement water recycling projects, in accordance with the Administrator's approved program and the approved Title 22 Engineering Report. The Administrator shall obtain written approvals for any changes to the Administrator's approved program, for example: new recycled water use types or distribution methods not already described in the Administrator's approved program.
4. The Administrator shall establish and enforce rules or regulations for recycled water uses governing the design and construction of recycled water use facilities and the use of recycled water in accordance with Specification B.1.
5. A User acting as a water recycling program Administrator is subject to the conditions of its water recycling program prepared in accordance with Specification B.1. A User acting as a water recycling program Administrator is responsible to implement water recycling administration requirements applicable to Users and Administrators as described in Water Recycling Administration Requirements C.1 – C.16.
6. The Administrator shall inspect to ensure that cross-connections between potable water and non-potable water systems have not been created and that backflow prevention devices are in proper working order by conducting or requiring User testing in accordance with the Uniform Statewide Recycling Criteria and California Code of Regulations, title 17, section 7605. Reports of

testing and maintenance shall be maintained by the Administrator. The Administrator may use a third party agent to perform this task, however, the Administrator is solely responsible for compliance with conditions of this permit and the approved water recycling program.

7. The Administrator shall ensure recycled water meets the quality standards of this General Order and shall be responsible for the operation and maintenance of major transport facilities and associated appurtenances. If an entity other than the Administrator has actual physical and ownership control over the recycled water transport facilities, the Administrator may delegate operation and maintenance responsibilities for such facilities to that entity. The Administrator shall require the use of the recycled water to be in accordance with the Uniform Statewide Recycling Criteria and to comply with this General Order, including requirements to apply only at agronomic rates and not cause unauthorized degradation, pollution, or nuisance. If not the same entity, the Producer shall provide water quality data and communicate to Users the nutrient levels in the recycled water.
8. The Administrator shall conduct periodic inspections of the User's facilities and operations to determine compliance with conditions of the Administrator requirements and this General Order. The Administrator shall take whatever actions are necessary, including the termination of delivery of recycled water to the User, to correct any User violations. The Administrator may use a third party agent to perform this task, however, the Administrator is solely responsible for compliance with conditions of this permit and the approved water recycling program.
9. The Administrator shall comply with all applicable items of the attached Standard Provisions and Reporting Requirements (Attachment C) and any amendments thereafter.
10. The Administrator shall require Users to comply with the Administrator’s use area conditions. Use area requirements shall be consistent with Specification B.1.
11. If recycled water will be transported by truck for uses consistent with the Uniform Statewide Recycling Criteria such as dust control, the Administrator shall provide notification and control measures for Users consistent with the provisions of the approved Title 22 Engineering Report that addresses protection of public health.
12. A copy of the Water Recycling Use Permit must be provided to Users by the Administrator (electronic format is acceptable). The Users must have the documents available for inspection by State and Regional Water Board staff, State/County officials, and/or the Administrator.
13. The Administrator shall comply with the attached monitoring and reporting program including any amendments issued by the entity that issued the NOA (State or Regional Water Board). This monitoring program shall be consistent with any applicable Salt and Nutrient Management Plan for the basin/sub-basin.

The Administrator is responsible for collecting reports from Users. Where applicable, Users are responsible for submitting on-site observation reports and use data to the Administrator, who will compile and file an annual report with the entity that issued the NOA. The Administrator, at its discretion, may assume the User's responsibility for on-site observation reports and use data.

14. The Administrator and Users shall maintain in good working order and operate as efficiently as possible any facility or control system to achieve compliance with this General Order. The Administrator may use a third party agent to perform this task, however, the Administrator is solely responsible for compliance with conditions of this permit and the approved water recycling program.

15. The Administrator shall require that personnel receive training to assure proper operation of recycling facilities, worker protection, and compliance with this General Order. The Administrator shall require Recycled Water Supervisor(s) to be familiar with the Administrator permit conditions.

16. The Administrator shall assure that all above ground equipment, including pumps, piping, storage reservoir, and valves which may at any time contain recycled water are identified with appropriate notification as required by the Uniform Statewide Recycling Criteria and California Health and Safety Code section 116815. The Administrator may use a third party agent to perform this task, however, the Administrator is solely responsible for compliance with conditions of this permit and the approved water recycling program.

D. GENERAL PROVISIONS

1. The Administrator shall document compliance with all conditions of this General Order and requirements specified in the Uniform Statewide Recycling Criteria and California Code of Regulations title 17.

2. If directed by the State Water Board or a Regional Water Board pursuant to Water Code section 13267, an Administrator shall prepare and submit a Salt and Nutrient Management Plan, acceptable to the entity that issued such order, to ensure that the overall impact of permitted water recycling projects does not degrade groundwater resources in a manner inconsistent with Findings 27 through 32. Unless otherwise directed by the entity that issued such order, in lieu of developing an individual Salt and Nutrient Management Plan, the Administrator shall participate in a Regional Water Board’s existing salt and nutrient management planning effort to meet the requirements of this provision.

3. State and/or Regional Water Board staff may conduct inspections/audits of water recycling projects. The Administrator and Users shall permit the State and/or Regional Water Board or its authorized representatives, in accordance with Water Code section 13267(c):

a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this General Order.

b. Access to and copy of, at reasonable times, any records that must be kept as a condition of this General Order.

c. Inspection, at reasonable times, of any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this General Order.

d. To sample or monitor, at reasonable times, for the purpose of assuring compliance with this General Order.

4. The State or Regional Water Board may terminate or modify an Administrator's coverage under this General Order for cause, including, but not limited to:

   a. Violation of any term or condition contained in this General Order;

   b. Obtaining this General Order by misrepresentation, or failure to disclose fully all relevant facts;

   c. Endangerment to public health or environment that can only be mitigated to acceptable levels by General Order modification or termination.

   d. An increase in recycle flows which causes a reduction of treated effluent flow from the wastewater treatment plant into a surface water body with beneficial uses dependent on flow without the approval of the Division of Water Rights.

5. The State or Regional Water Board, upon a finding of non-compliance with this General Order, may revoke an Administrator's authority to issue Water Recycling Use Permits.

6. The State Water Board will review this General Order periodically and may revise the requirements as deemed necessary.

7. Users shall comply with all requirements of other applicable WDRs or waivers of WDRs, including without limitation WDRs or waivers regulating agricultural discharges from irrigated lands.

8. The Administrators shall comply with the MRP issued with the NOA, as specified by the Regional Water Board's Executive Officer or State Water Board's Executive Director (or designee). A model MRP is provided as Attachment B. However, the State Water Board's Executive Director (or designee) may modify or replace the MRP when deemed necessary.

CERTIFICATION

The undersigned, Clerk to the State Water Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on June 7, 2016.

AYE:	Chair Felicia Marcus Vice Chair Frances Spivy-Weber Board Member Tam M. Doduc Board Member Steven Moore Board Member Dorene D'Adamo
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend
Clerk to the Board

Attachments:

A. Notice of Intent (NOI) - General Instructions
B. Monitoring and Reporting Program
C. Standard Provisions & Reporting Requirements
D. Definition of Terms

ATTACHMENT A: NOTICE OF INTENT (NOI) – GENERAL INSTRUCTIONS
ORDER WQ 2016-0068-DDW
WATER RECLAMATION REQUIREMENTS
FOR RECYCLED WATER USE

WHO MAY APPLY

This Order is intended to serve as a statewide General Order for use of recycled water. It may be used to (1) replace waste discharge requirements (WDRs) / water reclamation requirements (WRR) , or a conditional waiver of WDRs; (2) serve as an additional authorization for new uses of recycled water not previously permitted, issued to any of the following:

a. Producers of recycled water. Producers may be publicly or privately owned. A Producer will typically produce recycled water that meets the requirements of the Uniform Statewide Recycling Criteria. A Producer may also act as an Administrator.

b. Distributors of recycled water. In some cases, a Distributor may provide additional treatment (such as disinfection) to meet the Uniform Statewide Recycling Criteria for its intended use, and distribute it to Users. A Distributor is not required to take physical possession of the recycled water and may act simply as an Administrator.

c. Users of recycled water: Users take physical possession of the recycled water from a Producer or Distributor for an approved beneficial recycled water use consistent with the Uniform Statewide Recycling Criteria. Users may use the recycled water under a Water Recycling Use Permit from an Administrator or act as an Administrator.

d. A legal entity such as a joint powers agreement or equivalent contractual agreement between a Producer, Distributor, irrigation district, or other entity. Similar to a Distributor, a legal entity is not required to take physical possession of the recycled water and may act simply as an Administrator.

Applicants that have been previously issued an order authorizing water recycling may be able to submit an abbreviated information package. Such applicants should contact Regional Water Board and State Water Board staff to determine the application information needs.

Enrollees covered under Order WQ 2014-0090-DWQ who wish to continue coverage must acknowledge in writing their consent to coverage under this General Order. Enrollees who submit the required documentation will automatically be covered under this General Order. The State Water Board will provide existing enrollees with a form for this purpose. A new NOI is not required if the project has not materially changed.

Any applicant whose NOI is pending on the date this General Order is adopted must update its NOI to request coverage under this General Order. If the NOI is approved before the Effective Date, the applicant will be enrolled in Order WQ 2014-0090-DWQ

until the Effective Date and coverage under this General Order will commence on the Effective Date.

WHERE TO APPLY

An applicant should submit an NOI to their applicable Regional Water Board and submit a Title 22 Engineering Report to the applicable State Water Board Division of Drinking Water Field Operations Branch office. The NOI cannot be considered complete until the responsible staff in the State Water Board provides a Title 22 Engineering Report approval letter. An Applicant proposing to administer a water recycling program that covers recycled water use areas within multiple Regional Water Board jurisdictions and is therefore seeking General Order coverage from multiple Regional Water Boards may submit an NOI to the State Water Board.

WHEN TO APPLY

An applicant should normally file the NOI at least 90 days prior to the project start.

WHAT TO FILE

The NOI shall include a water recycling program technical report containing the following information:

SECTION I - FACILITY/WASTE TREATMENT INFORMATION

Description of existing and/or proposed treatment, storage, and transmission facilities for water recycling (much of this may be from current orders/reports, but should be updated if necessary). This shall include the type and level of wastewater treatment for water recycling applications, estimated seasonal flows of recycled water, and a summary of monitoring data that describes the chemical, physical, and disinfection characteristics of the recycled water. A copy of the approved Title 22 Engineering Report and the corresponding State Water Board approval letter, shall be included in the submittal.

SECTION II – RECYCLED WATER APPLICATION

Describe how recycled water will be used. This should include the following information:

a. Administrator owned/controlled uses

    1. An estimated amount of recycled water used at use area(s)

2. Relevant information regarding use type and use area (e.g. for agricultural irrigation use, provide information on irrigation type, acreage, and locations; for hydrostatic testing of utility pipelines, provide information on project locations, schedule/duration of testing, and type of utility pipeline; etc.).

3. A proposed Implementation or Operations and Management plan (Plan). For uses with frequent or routine application (such as irrigation), the Plan shall specify agronomic rates and nutrient application for the use area(s) and a set of reasonably practicable measures to ensure compliance with this General Order. For uses with infrequent or non-routine applications, the Plan shall specify a list of practices to ensure compliance with this General Order. The Plan may include a water and nutrient budget for use area(s), site supervisor training, periodic inspections, or other appropriate measures. An Administrator may submit a nutrient management plan developed to comply with another Water Board order, such as waste discharge requirements or a waiver regulating discharges from irrigated lands, in lieu of an Implementation or Operations and Management Plan.

b. Non-Administrator owned/controlled uses or contracted user applications (use areas that consist of small lots, e.g., residential/ industrial developments, roadway median irrigation, etc., may be aggregated to combine acreage for calculation purposes.)

1. List of Users receiving or proposing to receive recycled water (including a list of uses of recycled water for each User).

2. An estimated amount of recycled water used at use area(s) of each User.

3. A proposed Implementation or Operations and Management plan (Plan). For uses with frequent or routine application (such as irrigation), the Plan shall specify agronomic rates and nutrient application for the use area(s) and a set of reasonably practicable measures to ensure compliance with this General Order. For uses with infrequent or non-routine applications, the Plan shall specify a list of practices to ensure compliance with this General Order. The Plan may include a water and nutrient budget for use area(s), site supervisor training, periodic inspections, or other appropriate measures. This requirement does not apply to the extent Users are subject to WDRs or waivers of WDRs that require implementation of nutrient management plans.

4. Descriptions/maps of use area(s).

5. Method(s) of conveyance to Users.

SECTION III - DESCRIPTION OF WATER RECYCLING PROGRAM

The Administrator's water recycling program should be fully described as follows:

a. Description of the Administrator agency's authority, rules, and/or regulations
b. Design and implementation of program
c. Cross-connection testing responsibilities and procedures
d. Monitoring and Reporting Program
e. Use area inspection program
f. Operations and Maintenance program
g. Compliance program
h. Employee and User Training
i. Emergency procedures and notification

SECTION IV - ADDITIONAL SITE SPECIFIC CONDITIONS

If existing orders have additional site specific conditions and/or restrictions not covered in the General Order, they shall be described here. If a CEQA document for the project was prepared, include a copy of the certified or adopted document(s).

SECTION V - WATER RECYCLING PROGRAM ADMINISTRATION

Describe organization and responsibilities of pertinent personnel involved in the water recycling program. Provide the name(s), title(s) and phone number(s) of contact person(s) who are charged with operation/oversight of the water recycling program. Identify all agencies or entities involved in the production, distribution, and use of recycled water, and include a description of legal arrangements, such as, but not limited to, charters, agreements, or Memorandum of Understanding. Copies of such legal documents and organizational charts may be useful.

ATTACHMENT B: MONITORING AND REPORTING PROGRAM
ORDER WQ 2016-0068-DDW
WATER RECLAMATION REQUIREMENTS
FOR RECYCLED WATER USE

This monitoring and reporting program (MRP) describes requirements for monitoring a recycled water system. This MRP is issued pursuant to Water Code section 13267. The Administrator shall not implement any changes to this MRP unless and until a revised MRP is issued by the Regional Water Quality Control Board (Regional Water Board) Executive Officer.

The State Water Resources Control Board (State Water Board) and Regional Water Boards are transitioning to the paperless office system.

During the life of this General Order, the State Water Board or Regional Water Board may require the Administrator to electronically submit reports using the State Water Board's California Integrated Water Quality System (CIWQS) program or an alternative database. Electronic submittal procedures will be provided when directed to begin electronic submittals. Until directed to electronically submit reports, the Administrator shall submit hard copy reports.

In some regions, Administrators will be directed to submit reports (both technical and monitoring reports) to the State Water Board's GeoTracker database over the Internet in portable document format (pdf). In addition, analytical data shall be uploaded to the GeoTracker database under a site-specific global identification number. Information on the GeoTracker database is provided on the Internet at:

<http://www.waterboards.ca.gov/ust/electronic_submittal/index.shtml>

The Administrator has applied for and received coverage for the recycled water system that is subject to the notice of applicability (NOA) of Water Quality Order 2016-0068-DDW. The reports are necessary to ensure that the Administrator complies with the NOA and General Order. Pursuant to California Water Code section 13267, the Administrator shall implement this MRP and shall submit the monitoring reports described herein.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The name of the sampler, sample type (grab or composite), time, date, location, bottle type, and any preservative used for each sample shall be recorded on the sample chain of custody form. The chain of custody form must also contain all custody information including date, time, and to whom samples were relinquished. If composite samples are collected, the basis for sampling (time or flow weighted) shall be approved by Regional Water Board staff.

Field test instruments (such as those used to test pH, dissolved oxygen, and electrical conductivity) may be used provided that they are used by a California Environmental Laboratory Program (ELAP) certified laboratory or:

1. The user is trained in proper use and maintenance of the instruments;
2. The instruments are field calibrated prior to monitoring events at the frequency recommended by the manufacturer;
3. Instruments are serviced by the manufacturer or authorized representative at the recommended frequency; and
4. Field calibration reports are maintained and available for at least three years.

Monitoring requirements listed below may duplicate existing requirements under other orders including WDRs or waivers of WDRs that regulate agricultural discharges from irrigated lands. Duplication of sampling and monitoring activities are not required if the monitoring activity satisfies the requirements of this General Order. Collecting composite samples is acceptable in most cases. The facility may continue using existing sampling collection equipment that is consistent with the applicable facility order. However, due to short sample holding times, bacteriological samples collected to verify disinfection effectiveness must be grab samples. In addition to submitting the results under another order, the results shall be submitted in the reports required by this General Order.

All of the monitoring listed below may not be applicable to all recycled water projects. Consult the NOA or Regional Water Board staff to determine applicable requirements.

RECYCLED WATER MONITORING

If recycled water is used for irrigation of landscape areas[1], priority pollutant monitoring is required at the production facility. The frequency of monitoring corresponds to the flow rate of the recycled water use. Sampling shall be consistent with the following:

Constituent	Treatment System Flow Rate	Sample Frequency	Reporting Frequency
Priority Pollutants	< 1mgd	5 years	The next annual report.
	≥ 1mgd	Annually	Annually

mgd denotes million gallons per day.

1 Landscape areas are defined as parks; greenbelts, playgrounds; school yards; athletic fields; golf courses; cemeteries; residential landscaping; common areas; commercial landscaping (except eating areas); industrial landscaping (except eating areas); freeway, highway, and street landscaping.

DISINFECTION SYSTEM MONITORING

If disinfection is performed, samples shall be collected from downstream of the disinfection system and analyzed by an approved laboratory per Title 22, section 60321(a). Depending upon the level of disinfection and recycled water application to land, monitoring requirements vary. Disinfection monitoring shall be customized to the site-specific conditions from the following:

Constituent/Parameter	Units	Sample Type	Sample Frequency	Reporting Frequency
Total Coliform Bacteria	MPN/100 mL[(a)]	Grab	TBD [(b)]	TBD [(c)]
Turbidity	NTU[(a)]	Grab/Meter	TBD [(b)]	TBD [(c)]

[(a)] MPN/100 mL denotes most probable number per 100 mL sample. NTU denotes nephelometric turbidity unit.
[(b)] TBD (to be determined) shall be specified in the NOA or as required by California Code of Regulations, title 22 section 60321.
(c) TBD (to be determined) shall be specified in the NOA or as required by CCR, title 22, section 60329(c).

POND SYSTEM MONITORING

In some cases, recycled water storage ponds may be used to store recycled water when it is not needed. These monitoring requirements apply only to ponds permitted through this General Order. Ponds covered by an existing order shall continue to be monitored in accordance with that order. Pond(s) containing recycled water shall be monitored for the following:

Parameter	Units	Sample Type	Sample Frequency[(a)]	Reporting Frequency
Freeboard	0.1 feet	Measurement	Quarterly	Annually
Odors	--	Observation	Quarterly	Annually
Berm condition	--	Observation	Quarterly	Annually

[(a)] Or less frequently if approved by the Regional Water Board Executive Officer

USE AREA MONITORING

The Administrator shall monitor use areas(s) at a frequency appropriate to determine compliance with this General Order and the Administrator's recycled water use program requirements. An Administrator may assign monitoring responsibilities to a User as part of the Water Recycling Use Permit program; the Administrator retains responsibility to ensure the data is collected, as well as prepare and submit the annual report.

The following shall be recorded for each user with additional reporting for use areas as appropriate. The frequency of use area inspections shall be based on the complexity and risk of each use area. Use areas may be aggregated to combine acreage for calculation or observation purposes. Use area monitoring shall include the following parameters:

Parameter	Units	Sample Type	Sampling Frequency[a]	Reporting Frequency
Recycled Water User	--	--	--	Annually
Recycled Water Flow	gpd[b]	Meter[c]	Monthly	Annually
Acreage Applied[d]	Acres	Calculated	--	Annually
Application Rate	inches/acre/year	Calculated	--	Annually
Soil Saturation/Ponding	--	Observation	Quarterly	Annually
Nuisance Odors/Vectors	--	Observation	Quarterly	Annually
Discharge Off-Site	--	Observation	Quarterly	Annually
Notification Signs[e]	--	Observation	Quarterly	Annually

[a] Or less frequently if approved by the Regional Water Board Executive Officer.
[b] gpd denotes gallons per day.
[c] Meter requires meter reading, a pump run time meter, or other approved method.
[d] Acreage applied denotes the acreage to which recycled water is applied.
[e] Notification signs shall be consistent with the requirements of California Code of Regulations, title 22, section 60310 (g).

COOLING/INDUSTRIAL/OTHER USES OF RECYCLED WATER

If recycled water is used for industrial, commercial cooling, or air conditioning in which a mist is generated, the cooling system shall comply with California Code of Regulations, title 22, section 60306 (c).

DUAL PLUMBED RECYCLED WATER SYSTEMS

If dual plumbed recycled water systems are proposed, consult with State Water Board for additional reporting, design, and operation requirements. The frequency of testing for cross connection and backflow prevention devices shall be as listed below or more frequently if specified by State Water Board.

Requirement	Frequency	Reporting Frequency
Cross Connection Testing	Four Years[a]	30 days/Annually[b]
Backflow Incident	--	24 hours from discovery
Backflow Prevention Device Testing and Maintenance	Annually[c]	Annually

[a] Testing shall be performed at least every four years, or more frequently at the discretion of the State Water Board Division of Drinking Water.
[b] Cross connection testing shall be reported pursuant to California Code of Regulations, title 22, section 60314. The report shall be submitted to State Water Board within 30 days and included in the annual report to the Regional Water Board.
[c] Backflow prevention device maintenance shall be tested by a qualified person as described in California Code of Regulations, title 17, section 7605.

REPORTING

In reporting monitoring data, the Administrator shall arrange the data in tabular form so that the date, data type (e.g., flow rate, bacteriological, etc.), and reported analytical or visual inspection results are readily discernible. The data shall be summarized to illustrate compliance with this General Order and NOA as applicable. The results of any monitoring done more frequently than required at the locations specified in the MRP shall be reported in the next regularly scheduled monitoring report and shall be included in calculations as appropriate.

During the life of this General Order, the State Water Board or Regional Water Board may require the Administrator to electronically submit reports using the State Water Board's California Integrated Water Quality System (CIWQS) program or an alternative database. Electronic submittal procedures will be provided when directed to begin electronic submittals. Until directed to electronically submit reports, the Administrator shall submit hard copy reports.

A. Annual Report

Annual Reports shall be submitted to the Regional Water Board by **April 1st following the monitoring year**. The Annual Report shall include the following:

1. A summary table of all recycled water Users and use areas. Maps may be included to identify use areas. Newly permitted recycled water Users and use areas shall be identified. When applicable, supplement to the Title 22 Engineering Report and the State Water Board approval letter supporting those additions shall be included.
2. A summary table of all inspections and enforcement activities initiated by the Administrator. Include a discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into compliance with the NOA and/or General Order. Copies of documentation of any enforcement actions taken by the Administrator shall be provided.
3. An evaluation of the performance of the recycled water treatment facility, including discussion of capacity issues, system problems, and a forecast of the flows anticipated in the next year.

4. Tabular and graphical summaries of all monitoring data collected during the year, including priority pollutant monitoring, if required.
5. The name and contact information for the recycled water operator responsible for operation, maintenance, and system monitoring.

A letter transmitting the annual report shall accompany each report. The letter shall summarize the numbers and severity of violations found during the reporting period, and actions taken or planned to correct the violations and prevent future violations. The transmittal letter shall contain the following penalty of perjury statement and shall be signed by the Administrator or the Administrator's authorized agent:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of the those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The Administrator shall implement the above monitoring program.

ATTACHMENT C: STANDARD PROVISIONS AND REPORTING REQUIREMENTS
ORDER WQ 2016-0068-DDW
WATER RECLAMATION REQUIREMENTS
FOR RECYCLED WATER USE

A. GENERAL PROVISIONS

1. Duty to Comply

   a. An Administrator must comply with all of the conditions of this General Order and the MRP. Any General Order or MRP non-compliance constitutes a violation of the Water Code and/or Basin Plan and is subject to enforcement action.

   b. The filing of a request by the Administrator for a modification, revocation and reissuance, termination, a notification of planned changes, or anticipated non-compliance does not stay any General Order or MRP condition.

2. Duty to Mitigate

   The Administrator shall take all reasonable steps to minimize or prevent any discharge in violation of this General Order which has a reasonable likelihood of adversely affecting public health or the environment, including such accelerated or additional monitoring as requested by the State or Regional Water Board to determine the nature and impact of the violation.

3. Property Rights

   This General Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from liabilities under federal, state, or local laws.

4. Duty to Provide Information

   The Administrator shall furnish, within a reasonable time, any information the Regional Water Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the General Order coverage. The Administrator shall also furnish to the Regional Water Board, upon request, copies of records required to be kept by its General Order.

5. Availability

   A copy of this General Order, the NOA, and the MRP shall be maintained at the Administrator facilities and be available at all times to operating personnel.

B. GENERAL REPORTING REQUIREMENTS

1. Signatory Requirements

   a. All reports required by this General Order and other information requested by the Regional Water Board shall be signed by the Administrator principal owner or operator, or by a duly authorized representative of that person.

Duly authorized representative is one whose:

1) Authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as general manager in a partnership, manager, operator, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position), and

2) Written authorization is submitted to the Regional Water Board. If an authorization becomes no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements above must be submitted to the Regional Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative.

b. Certification

All reports signed by a duly authorized representative under Provision C.1 shall contain the following certification:

"I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

2. Should the responsible reporting party discover that it failed to submit any relevant facts or that it submitted incorrect information in any report, it shall promptly submit the missing or correct information. All violations of any requirements in this General Order, including Uniform Statewide Recycling Criteria requirements shall be submitted in the annual self-monitoring reports.

3. False Reporting

Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this General Order, including monitoring reports or reports of compliance or non-compliance shall be subject to enforcement procedures as identified in Section C of these Provisions.

C. ENFORCEMENT

1. The provision contained in this enforcement section shall not act as a limitation on the statutory or regulatory authority of the State and Regional Water Board.
2. Any violation of this General Order constitutes violation of the Water Code and regulations adopted thereunder, and are the basis for enforcement action, General Order termination, General Order revocation and reissuance, denial of an application for General Order reissuance, or a combination thereof.
3. The State and Regional Water Board may impose administrative civil liability, may refer a discharger to the State Attorney General to seek civil monetary penalties, may seek injunctive relief or take other appropriate enforcement action as provided in the Water Code for violation of this General Order.

ATTACHMENT D: DEFINITION OF TERMS
ORDER WQ 2016-0068-DDW
WATER RECLAMATION REQUIREMENTS
FOR RECYCLED WATER USE

Definitions noted with (*) are from the Uniform Statewide Recycling Criteria. The definitions are provided in this Attachment for convenience and are subject to revisions should the codes are formally revised. Please refer to the formal published codes [Health & Safety Code or Title 22 of the California Code Regulations] to obtain the latest version.

Administrator: An Administrator is an entity (Producer, Distributor, User, or legal entity) that submits an NOI and application fee to the Regional Water Board for coverage under this General Order. An Administrator may issue use permits for uses of recycled water consistent with the Uniform Statewide Recycling Criteria. An Administrator is responsible for coordinating, collecting data, and reporting the monitoring reports to the Regional Water Board.

Agronomic Rates: The rate of application of recycled water to plants necessary to satisfy the plants' evapotranspiration requirements, considering allowances for supplemental water (e.g., effective precipitation), irrigation distribution uniformity, and leaching requirement, thus minimizing the movement of nutrients below the plants' root zone.

Coagulated Wastewater *: Oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated upstream from a filter by the addition of suitable floc-forming chemicals.

Conventional Treatment *: A treatment chain that utilizes a sedimentation unit process between the coagulation and filtration processes and produces an effluent that meets the definition for disinfected tertiary recycled water.

Disinfected Secondary-23 *: Recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 23 per 100 milliliters using the bacteriological results of the last seven days for which analyses have been completed, and the number of coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30 day period.

Disinfected Secondary-2.2 *: Recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of coliform organisms does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period.

Disinfected Tertiary Recycled Water *: A filtered and subsequently disinfected wastewater that meets the following criteria:

(a) The filtered wastewater which has been disinfected by either:

(1) A chlorine disinfection process following filtration that provides a contact time (CT, the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or

(2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.

(b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

Disinfected Wastewater *: Wastewater in which the pathogenic organisms have been reduced by chemical, physical or biological means. For the purposes of this General Order, disinfected wastewater is safe for use when applied consistent with the requirements of the Uniform Statewide Recycling Criteria.

Distributor: A private or public agency which receives recycled water from a Producer for the purpose of distribution to Users. In some cases, a distributor may provide additional treatment (such as disinfection) to meet the Uniform Statewide Recycling Criteria for its intended use, and distributes it to Users. A Distributor may not take physical possession of the recycled water and may act simply as an Administrator.

Dual Plumbed System *: A system that utilizes separate piping systems for recycled water and potable water within a facility and where the recycled water is used for either of the following purposes:

a) To serve plumbing outlets (excluding fire suppression systems) within a building or

b) Outdoor landscape irrigation at individual residences.

Filtered Wastewater *: An oxidized wastewater that meets the criteria in the subsection 1 or 2:

(1) Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following:

a. At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in travelling automatic backwash filters; and

b. So that the turbidity of the filtered wastewater does not exceed any of the following:

i. An average 2 NTU within a 24-hour period;

ii. 5 NTU more than 5 percent of the time within a 24-hour period; and

iii. 10 NTU at any time

(2) Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:

a. 0.2 NTU more than 5 percent of the time within a 24-hour period; and

b. 0.5 NTU at any time

F-specific bacteriophage MS-2 *: A strain of a specific type of virus that infects coliform bacteria that is traceable to the American Type Culture Collection (ATCC 15597B1) and is grown on lawns of E. Coli (ATCC 15597).

Incidental Runoff: Unintended small amounts (volume) of runoff from recycled water use areas, such as unintended, minimal over-spray from sprinklers that escapes the recycled water use area. Water leaving a recycled water use area is not considered incidental if it is part of the facility design, if it is due to excessive application, if it due to intentional overflow or application, or if it is due to negligence.

Legal Entity: A legal entity is an entity formed by a legal document (such as a joint powers agreement or equivalent contractual agreement) between a Producer, Distributor, irrigation district, or other entity. Similar to a Distributor, a legal entity may not take physical possession of the recycled water and may act simply as an Administrator.

Modal Contact Time *: The amount of time elapsed between the time that a tracer, such as salt or dye, is injected into the effluent at the entrance to a chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber.

Nonrestricted Recreational Impoundment *: An impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities.

NTU (Nephelometric Turbidity Unit) *: A measurement of turbidity as determined by the ratio of the intensity of light scattered by the sample to the intensity of incident light scattered by the sample to the intensity of incident light as measured by method 2130 B. in Standard Methods for the Examination of Water and Wastewater, 20th ed.; Eaton, A.D., Clesceri, L.S., and Greenberg, A.E., Eds; American Public Health Association: Washington, DC, 1995; p.2-8.

Oxidized Wastewater *: Wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

Recycled Water Producer: Any entity that produces recycled water.

Recycled Water: Means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur therefore considered a valuable resource. (Wat. Code, § 13050(n).) Coverage under these Water Reclamation Requirements for Recycled Water Use (General Order) is limited to treated municipal wastewater for non-potable uses.

Recycled Water Supervisor: A person designated, by the Administrator that acts as the coordinator between the supplier and User. The Recycled Water Supervisor shall have authority to ensure recycled water use complies with the General Order, NOA, and the Uniform Statewide Recycling Criteria.

Regional Water Board: All references to a Regional Water Board include the Executive Officer, who may act for the Regional Water Board in carrying out this General Order. See Water Code section 13223.

Restricted access golf course *: A golf course where public access is controlled so that areas irrigated with recycled water cannot be used as if they were part of a park, playground, or school yard and where irrigation is conducted only in areas and during periods when the golf course is not being used by golfers.

Restricted Recreational Impoundment *: An impoundment of recycled water in which recreation is limited to fishing, boating, and other non-body-contact water recreational activities.

Spray Irrigation *: The application of recycled water to plants to maintain vegetation or support growth of vegetation by applying it from sprinklers.

State Water Board: All references to the State Water Board refer to divisions within the State Water Board whose roles in carrying out this General Order are as following:

- Division of Drinking Water reviews and approves (Title 22 Engineering Report and provide recommendations to the Regional Water Boards to address protection of public health. Division of Drinking Water is also processes any Notice of Intent submitted by a potential enrollee needing coverage from multiple Regional Water Boards.
- Division of Water Rights is responsible for approval of wastewater change petitions for water recycling projects that will decrease the amount of water in a stream or other waterway.

Surface Irrigation: Application of recycled water by means other than spraying such that contact between the edible portion of any food crop and recycled water is prevented (i.e., drip or flood irrigation).

Title 22 Engineering Report : Engineering report prepared to describe the manner by which a project or a water recycling program will comply with the Uniform Statewide Recycling Criteria.

Undisinfected Secondary *: Means oxidized wastewater.

Use Area: An area of recycled water use with defined boundaries. Agricultural use areas may contain one or more facilities (ditch, irrigated fields, pumping stations, etc.); use areas may also consist of an aggregate of small lots (e.g., residential/ industrial developments, roadway median irrigation, etc.).

Use Area Supervisor: A person designated, by the owner or manager of the property upon which recycled water will be applied, to discharge the responsibility of the owner or manager of the property for: (a) installation, operation and maintenance of a system that enables recycled water to be used; (b) for prevention of potential hazards; (c) implementing and complying with conditions of all Water Recycling Use Permits and associated documents; (d) coordination with the cross-connection control program of the supplier of drinking water and the local health/environmental health agency; (e) control of on-site piping to prevent any cross connections with potable water supplies; (f) routine inspection and maintenance of backflow prevention devices. (A Recycled Water Supervisor and Use Area Supervisor may be one in the same in some instances).

User: Users take physical possession of the recycled water from Producer and/or Distributor for an approved beneficial recycled water use consistent with the Uniform Statewide Recycling Criteria. Users may use the recycled water under either a Water Recycling Use Permit from an Administrator or act as an Administrator under this General Order.

Water Recycling Use Permit: A permit issued by the Administrator to the Recycled Water User, which is consistent with the requirements specified in this General Order.

WATER QUALITY CONTROL POLICY FOR RECYCLED WATER

Adopted December 11, 2018

Effective April 8, 2019

STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

DIVISION OF WATER QUALITY
STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Edmund G. Brown Jr. Governor

California Environmental Protection Agency
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Water Quality Control Policy for Recycled Water

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Acronym	**Definition**
af	Acre feet
AhR	Aryl hydrocarbon receptor
AOP	Advanced oxidation process
Basin plan	Water quality control plan
BEQ	Bioanalytical equivalent concentration
CEC	Constituent of emerging concern
CEQA	California Environmental Quality Act
DOC	Dissolved organic carbon
ELAP	Environmental Laboratory Accreditation Program
ER-α	Estrogen receptor - alpha
GAMA	Groundwater Ambient Monitoring and Assessment
GSP	Groundwater sustainability plan
MEC	Measured environmental concentration
MTL	Monitoring trigger level
NDMA	N-nitrosodimethylamine
NMOR	N-Nitrosomorpholine
Order WQ 2016-0068-DDW	Order WQ 2016-0068-DDW, Water Reclamation Requirements for Recycled Water Use
PFOS	Perfluorooctane sulfonate
PFOA	Perfluorooctanoic acid
Policy	Water Quality Control Policy for Recycled Water
Regional water board	Regional water quality control board
RO	Reverse osmosis
State Water Board	State Water Resources Control Board
STORMS	Strategy to Optimize Resource Management of Stormwater
Uniform Statewide Recycling Criteria	California Code of Regulations, title 22, division 4, chapter 3
U.S. EPA	U.S. Environmental Protection Agency
UV	Ultraviolet
Water Code	California Water Code

Definitions

The following are definitions of terms used in the Policy.

Basin Plan amendment: An amendment to a water quality control plan that has been adopted by the regional water board and approved by the State Water Board and Office of Administrative Law.

Bioanalytical equivalent concentration (BEQ): The output from bioanalytical screening tools are referenced to a substance that initiates a physiological response from the receptor (strong agonist) to generate BEQs. A BEQ is generated from a standard curve of a strong agonist for the receptor and is expressed in mass (ng/L) or molar concentration units. A BEQ is typically derived by comparing the 50^{th} percentile effect concentration (EC50) or 10^{th} percentile effect concentration (EC10) responses of the test sample with the same effect concentration (EC) level of the standard curve. The BEQ is compared to the Monitoring Trigger Level in water for the strong agonist for the receptor used to generate the BEQ. In the event the sample BEQ result is at or below the Reporting Limit in Table 3 of Attachment A, the Reporting Limit shall be used to generate the BEQ.

Bioanalytical screening: The use of *in vitro* (cell or protein-based) assays to screen for CECs and measure potential adverse effects of CECs on living cells or tissues. These assays are also known as bioanalytical screening tools.

Constituents of emerging concern (CECs): For purposes of this Policy, CECs are defined to be constituents in personal care products; pharmaceuticals; antimicrobials; industrial, agricultural, and household chemicals; naturally-occurring hormones; food additives; transformation products; inorganic constituents; microplastics; and nanomaterials.

Desalination facility: An industrial facility that processes water to remove salts and other components from the source water to produce water that is less saline than the source water.

Enclosed bays: Enclosed bays are indentations along the coast which enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes but is not limited to: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

Estuaries and coastal lagoons: Estuaries and coastal lagoons are waters at the mouths of streams that serve as mixing zones for fresh and ocean waters during a major portion of the year. Mouths of streams that are temporarily separated from the ocean by sandbars shall be considered as estuaries. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters. The waters described by this definition include but are not limited to the Sacramento-San Joaquin Delta as defined by section 12220 of the Water Code, Suisun Bay, Carquinez Strait downstream to Carquinez Bridge, and appropriate areas of the Smith, Klamath, Mad, Eel, Noyo, and Russian Rivers.

Groundwater recharge: Indirect potable reuse for groundwater recharge is defined in Water Code section 13561(c), as the planned use of recycled water for replenishment of a groundwater basin or an aquifer that has been designated as a source of water supply for a public water system. Groundwater recharge by surface application is the controlled application of water to a spreading area for infiltration resulting in the recharge of a groundwater basin or an aquifer. Subsurface application is the controlled application of water to a groundwater basin or aquifer by a means other than surface application, such as direct injection through a well.

Health-based CECs: CECs that have toxicological relevance to human health. Some health-based CECs may also serve as performance indicator CECs.

Incidental runoff: Unintended small amounts (volume) of runoff from recycled water use areas, such as unintended, minimal over-spray from sprinklers that escapes the recycled water use area. Water leaving a recycled water use area is not considered incidental if it is due to the facility design, excessive application, intentional overflow or application, or negligence.

Measured environmental concentration (MEC): Concentration measured at the monitoring locations specified in Attachment A.

Method detection limit: The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix.

Monitoring trigger level (MTL): CEC concentrations above which response actions may be required. MTLs were established by the Science Advisory Panel for CECs in Recycled Water in their final report "*Monitoring Strategies for Constituents of Emerging Concern (CECs) in Recycled Water – Recommendations of a Science Advisory Panel*," dated April 2018.

Non-potable recycled water: Recycled water that is treated for non-potable use pursuant to the uniform statewide recycling criteria in California Code of Regulations, title 22. Non-potable recycled water uses include but are not limited to irrigation, industrial or commercial cooling, supply for recreational impoundment, toilet flushing, and dust control.

Notification level: Health-based advisory levels established by the State Water Board's Division of Drinking Water for chemicals in drinking water that lack maximum contaminant levels. When chemicals are found at concentrations greater than their notification levels, certain requirements and recommendations apply.

Ocean waters: The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons.

Quality assurance project plan (QAPP): A document describing in comprehensive detail the necessary quality assurance, quality control, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria.

Performance indicator CECs: CECs that do not have human health relevance but can be used to monitor the efficacy of recycled water treatment processes.

Permit: For purposes of this Policy, the term “permit” means an order adopted by a regional water board or the State Water Board prescribing requirements for a recycled water project, including but not limited to water recycling requirements pursuant to Water Code section 13523, master recycling permits pursuant to Water Code section 13523.1, National Pollutant Discharge Elimination System permits pursuant to the Federal Water Pollution Control Act and Water Code section 13377, waste discharge requirements pursuant to Water Code section 13263, and waivers of waste discharge requirements pursuant to Water Code section 13269.

Raw water augmentation: The planned placement of recycled water into a system of pipelines or aqueducts that deliver raw water to a drinking water treatment plant that provides water to a public water system as defined in section 116275 of the Health and Safety Code (Water Code § 13561).

Recycled water: Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource (Water Code §13050(n)).

Recycled water producer: An entity that is permitted to produce recycled water consistent with California Code of Regulations, title 22 at a wastewater treatment plant or water recycling treatment plant.

Recycled water project proponent: An entity seeking permit coverage for a planned recycled water project.

Regional water board: A regional water quality control board. All references to regional water board include the executive officer or his/her designee, who may act for the regional water board in carrying out the provisions of this Policy consistent with Water Code section 13223.

Reporting Limit: The measured value of an analyte that can be reliably detected and quantified within acceptable limits of precision and bias for a given method. This value is further defined as no lower than the lowest calibration standard performed within the calibration process. Reporting limits are the minimum value below which data are documented as non-detects.

Reservoir water augmentation: The planned placement of recycled water into a raw surface water reservoir used as a source of domestic drinking water supply for a public water system or into a constructed system conveying water to such a reservoir (Wat. Code § 13561; also referred to as surface water augmentation in Wat. Code § 13562).

State Water Board: The State Water Resources Control Board. All references to the State Water Board include the executive director or his/her designee.

Surrogate: A measurable physical or chemical property that can be used to measure the effectiveness of trace organic compound removal by a treatment process and/or provide an indication of a treatment process failure.

Treated drinking water augmentation: The planned placement of recycled water into the water distribution system of a public water system, as defined in section 116275 of the Health and Safety Code.

Water purveyor: An entity that supplies water.

Wastewater treatment plant: Any of the following, as defined in Water Code section 13625(d):

(A) Any facility owned by a state, local, or federal agency and used in the treatment or reclamation of sewage and industrial wastes.

(B) Any privately-owned facility used in the treatment or reclamation of sewage and industrial wastes and regulated by the Public Utilities Commission pursuant to sections 216 and 230.6 of, and Chapter 4 (commencing with Section 701) of Part 1 of Division 1, of the Public Utilities Code.

(C) Any privately-owned facility used primarily in the treatment or reclamation of sewage for which the state board or a regional board has issued waste discharge requirements.

Consistent with California Code of Regulations, title 23, section 3671, the term "wastewater treatment plant" does not include onsite sewage treatment systems as defined in Water Code section 13290.

Water recycling treatment plant: A wastewater treatment plant that further treats secondary or tertiary effluent, or both, for the purpose of meeting the uniform statewide recycling criteria established pursuant to Water Code section 13521 for the use of recycled water, as defined in Water Code section 13625(g).

1. Purpose

1.1. The purpose of the Policy for Water Quality Control for Recycled Water (Recycled Water Policy, hereafter Policy) is to encourage the safe use of recycled water from wastewater sources that meets the definition in California Water Code (Water Code) section 13050(n), in a manner that implements state and federal water quality laws and protects public health and the environment.

1.2. This Policy provides direction to the regional water quality control boards (regional water boards), proponents of recycled water projects, and the public regarding the methodology and appropriate criteria for the State Water Resources Control Board (State Water Board) and the regional water boards to use when issuing permits for recycled water projects.

1.3. All elements of this Policy are to be interpreted in a manner that fully implements state and federal water quality laws and regulations to enhance the environment and put the waters of the state to the fullest use of which they are capable.

1.4. This Policy describes the circumstances under which permittees may enroll under statewide water reclamation requirements for recycled water use (e.g., State Water Board Order WQ 2016-0068-DDW) or choose an alternate permitting mechanism, such as a master recycling permit. The intent of statewide water reclamation requirements for recycled water use is to expedite the permitting of recycled water projects in a manner that implements state and federal water quality laws while allowing the regional water boards to focus their limited resources on projects that require substantial regulatory review due to unique site-specific conditions.

1.5. It is the State Water Board's intent to maximize consistency in the permitting of recycled water projects while also preserving sufficient authority and flexibility for the regional water boards to address site-specific conditions.

2. Benefits of recycled water

2.1. When used in compliance with this Policy, California Code of Regulations, title 22 and all applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to fresh water or potable water for such approved uses.

2.2. Recycled water is presumed to have a beneficial impact when used in accordance with this Policy and all applicable regulations, that is, when supporting the sustainable use of groundwater and surface water with the intent of substituting for use of fresh water or potable water. Other public agencies are encouraged to use this presumption in evaluating the impacts of recycled water projects on the environment as required by the California Environmental Quality Act (CEQA).

2.3. The State Water Board supports the use of recycled water to diversify community water supplies and mitigate the impacts of climate change.

3. Goals and reporting requirements to track recycled water

3.1. *Goals.* To support water supply diversity and sustainability and to encourage the increased use of recycled water in California, the State Water Board adopts the following goals:

3.1.1. Increase the use of recycled water from 714,000 acre-feet per year (afy) in 2015 to 1.5 million afy by 2020 and to 2.5 million afy by 2030.

3.1.2. Reuse all dry weather direct discharges of treated wastewater to enclosed bays, estuaries and coastal lagoons, and ocean waters that can be viably put to a beneficial use. For the purpose of this goal, treated wastewater does not include discharges necessary to maintain beneficial uses and brine discharges from recycled water facilities or desalination facilities.

3.1.3. Maximize the use of recycled water in areas where groundwater supplies are in a state of overdraft, to the extent that downstream water rights, instream flow requirements, and public trust resources are protected.

3.2. *Annual reporting requirements.* The State Water Board will evaluate progress toward these goals and revise the goals as necessary. To support this evaluation, the Executive Director will issue an order consistent with Water Code section 13267 and Water Code section 13383 to require wastewater treatment plants and recycled water producers to annually report the information listed in this section. The Executive Director may modify the reporting requirements of this section, as needed, to effectively evaluate progress toward the goals. All volumetric data shall be reported on an annual basis as acre-feet (af) to a database identified by the State Water Board.

3.2.1. *Influent*. Monthly total volume of wastewater collected and treated by the wastewater treatment plant.

3.2.2. *Production*. Monthly volume of wastewater treated, specifying level of treatment.

3.2.3. *Discharge*. Monthly volume of treated wastewater discharged to each of the following, specifying level of treatment:

- Inland surface waters, specifying volume required to maintain minimum instream flow.
- Enclosed bays, estuaries and coastal lagoons, and ocean waters.
- Natural systems, such as wetlands, wildlife habitats, and duck clubs, where augmentation or restoration has occurred, and that are not part of a wastewater treatment plant or water recycling water treatment plant.
- Underground injection wells, such as those classified by U.S. EPA's Underground Injection Control Program, excluding groundwater recharge via subsurface application intended to reduce seawater intrusion into a coastal aquifer with a seawater interface.

- Land, where beneficial use is not taking place, including evaporation or percolation ponds, overland flow, or spray irrigation disposal, excluding pasture or fields with harvested crops.

3.2.4. *Reuse.*

3.2.4.1. Monthly volume of recycled water distributed.

3.2.4.2. Annual volume of treated wastewater distributed for beneficial use in compliance with California Code of Regulations, title 22 in each of the use categories listed below.

- Agricultural irrigation: pasture or crop irrigation.
- Landscape irrigation: irrigation of parks, greenbelts, and playgrounds; school yards; athletic fields; cemeteries; residential landscaping, common areas; commercial landscaping; industrial landscaping; and freeway, highway, and street landscaping.
- Golf course irrigation: irrigation of golf courses, including water used to maintain aesthetic impoundments within golf courses.
- Commercial application: commercial facilities, business use (such as laundries and office buildings), car washes, retail nurseries, and appurtenant landscaping that is not separately metered.
- Industrial application: manufacturing facilities, cooling towers, process water, and appurtenant landscaping that is not separately metered.
- Geothermal energy production: augmentation of geothermal fields.
- Other non-potable uses: including but not limited to dust control, flushing sewers, fire protection, fill stations, snow making, and recreational impoundments.
- Groundwater recharge: surface or subsurface application, except for seawater intrusion barrier use.
- Seawater intrusion barrier: groundwater recharge via subsurface application intended to reduce seawater intrusion into a coastal aquifer with a seawater interface.
- Reservoir water augmentation: the planned placement of recycled water into a raw surface water reservoir used as a source of domestic drinking water supply for a public water system, as defined in section 116275 of the Health and Safety Code, or into a constructed system conveying water to such a reservoir (Water Code § 13561).

- Raw water augmentation: the planned placement of recycled water into a system of pipelines or aqueducts that deliver raw water to a drinking water treatment plant that provides water to a public water system as defined in section 116275 of the Health and Safety Code (Water Code § 13561).

- Other potable uses: both indirect and direct potable reuse other than for groundwater recharge, seawater intrusion barrier, reservoir water augmentation, or raw water augmentation.

3.3. The State Water Board and regional water boards will exercise the authority granted to them by the Legislature to the fullest extent possible to encourage the use of recycled water, consistent with state and federal water quality laws and with state and federal laws to protect public health.

3.3.1. Agencies producing recycled water that is available for reuse and not being put to beneficial use shall make that recycled water available to water purveyors for reuse on reasonable terms and conditions. Such terms and conditions may include payment by the water purveyor of a fair and reasonable share of the cost of the recycled water supply and facilities.

3.3.2. It is a waste and unreasonable use of water for water agencies not to use recycled water when recycled water of adequate quality is available and is not being put to beneficial use, pursuant to the conditions established in Water Code sections 13550 *et seq*. The State Water Board shall exercise its authority pursuant to Water Code section 275, as appropriate, to enforce these requirements.

3.4. The State Water Board requests the Public Utilities Commission, Department of Water Resources, State Lands Commission, and Coastal Commission to use their respective authorities to the fullest extent possible to promote and streamline permitting and funding of recycled water projects to assist the State Water Board and the regional water boards in increasing the use of recycled water in California to make progress toward achieving the recycled water goals set forth in 3.1.

4. State agency roles

The State Water Board recognizes that it shares jurisdiction over regulating the uses of recycled water with the regional water boards. In addition, the State Water Board recognizes several agencies have roles in encouraging the use of recycled water.

4.1. The State Water Board establishes general policies governing the permitting of recycled water projects, develops uniform water recycling criteria appropriate to particular uses of water, processes and approves wastewater change petitions filed by wastewater dischargers for recycled water projects that have the potential to decrease the flow in any portion of a watercourse such as a river or stream, adopts statewide orders for the permitting of recycled water projects, reviews and approves Title 22 engineering reports for recycled water use, and allocates and disperses funding for recycled water projects consistent with its roles of protecting water quality, public health, and sustaining water supplies. The State Water Board exercises general oversight over recycled water projects, including review of regional water board permitting practices,

and leads the effort to meet the recycled water use goals set forth in 3.1. The State Water Board is also responsible for implementing portions of the Sustainable Groundwater Management Act. The State Water Board's responsibilities under the Sustainable Groundwater Management Act are specific to state intervention, which is the process of managing a basin's groundwater resources if local efforts fail.

4.2. The regional water boards issue permits that include requirements needed to protect water quality, human health, and the environment consistent with the State and Regional Water Quality Control Plans, Policies, and applicable law. The regional water boards will, pursuant to 3.3, use their authority to the fullest extent possible to encourage the use of recycled water and to streamline permitting of recycled water projects.

4.3. The Department of Water Resources is charged with reviewing urban water management plans and, every five years, updating the California Water Plan, including evaluating the quantity of recycled water presently being used, planning for the potential future uses of recycled water, and updating statewide targets for recycled water use, consistent with Water Code section 10608.50(b). Pursuant to Water Code section 13577, the Department of Water Resources is also charged with adopting regulations in the California Plumbing Code to provide design standards to safely plumb buildings with both potable and recycled water systems. The State Water Board and Department of Water Resources work in collaboration to track recycled water volume and use in California. In undertaking these tasks, the Department of Water Resources may rely on annual recycled water production and use data collected by the State Water Board as well as urban water management plans. The Department of Water Resources may share the data from those plans with the State Water Board and the regional water boards. The Department of Water Resources shares with the State Water Board the authority to allocate and distribute bond funding, which can provide incentives for the use of recycled water. The Department of Water Resources is charged with implementing elements of the Sustainable Groundwater Management Act and provides technical and financial assistance to the groundwater sustainability agencies as they develop groundwater sustainability plans (GSPs). The Department of Water Resources also developed GSP regulations and is responsible for reviewing and approving GSPs and with GSP implementation pursuant to Water Code sections 10733, 10733.2, and 10733.8. The Department of Water Resources is charged with reviewing agricultural water management plans every five years and submitting a report to the California Legislature summarizing the status of the plans, pursuant to Water Code section 10845.

4.4. The Public Utilities Commission is charged with approving rates and terms of service for the use of recycled water by investor-owned utilities.

4.5. The Department of Food and Agriculture is charged with promoting California agriculture and food products and ensuring the safety and quality of these products for the consumer, including products irrigated with recycled water. The State Water Board and Department of Food and Agriculture will work in collaboration to support agricultural diversity and sustainability by working with grower coalitions, third-party technical service providers, public and private agricultural entities, and academia.

5. Wastewater change petitions

In many cases, recycled water project proponents will be required to obtain approvals from several regulatory agencies prior to implementing their project. If the proposed recycled water project will result in reduced stream flows, an approved wastewater change petition may be required pursuant to Water Code section 1211 as described below. For this reason, the State Water Board encourages early coordination by the recycled water project proponent with the State Water Board's Division of Water Rights and Division of Financial Assistance, the regional water boards, Department of Water Resources, and Department of Fish and Wildlife in the process of funding and permitting recycled water projects to ensure compliance with Water Code section 1211.

5.1. Prior to changing the point of discharge, place of use, or purpose of use of treated wastewater that will decrease the flow in any portion of a watercourse, or receiving state funding for the treatment or use of recycled water, the recycled water project proponent must receive (1) concurrence from the State Water Board's Division of Water Rights that an order approving the change is not required; or (2) State Water Board approval of the proposed change pursuant to Water Code section 1211. The recycled water project proponent shall notify the applicable regional water board and any applicable state funding agency (such as the Division of Financial Assistance of the State Water Board or the Department of Water Resources) of the concurrence or approval.

5.2. To approve a wastewater change petition, the State Water Board must determine that the proposed change will not injure any other legal user of the water involved, will not unreasonably affect instream uses including fish and wildlife, and is in the public interest. In addition, the State Water Board must find that the requirements of CEQA, including, where applicable, an analysis of cumulative impacts, have been met. The State Water Board also has an independent obligation to consider the effect of the proposed change and the cumulative impacts of water projects (including the proposed recycled water project and other projects that may affect the watercourse) on public trust resources and to protect those resources where feasible. (*National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419 [189 Cal. Rptr. 346, 658 P.2d 709].)

5.3. The use of recycled water may only occur if all requirements prescribed by the State Water Board pursuant to Water Code section 1211 are being met. Furthermore, compliance with Water Code section 1211 shall not be construed to release any recycled water project proponent from the obligation to comply with any additional regional water board or State Water Board requirements applicable to the recycled water project.

6. Salt and nutrient management plans

6.1. Introduction

6.1.1. Some groundwater basins in the state contain salts and nutrients that exceed or threaten to exceed water quality objectives established in the applicable regional water board Water Quality Control Plans (basin plans). Not all basin plans include adequate implementation procedures for achieving or ensuring compliance with the water quality objectives for salts or nutrients. These

conditions can be caused by naturally-occurring sources of salinity, discharges of agricultural, domestic, industrial, and municipal wastewater; fertilizers; and residual solids (including on-site wastewater treatment systems). In addition, irrigation using imported water, diverted water, surface water, groundwater, or recycled water, and indirect potable reuse for groundwater recharge (groundwater recharge) can contribute to increased salt and nutrient loading. Regulation of recycled water alone will not fully address these conditions.

6.1.2. Salts and nutrients from all sources must be managed on a basin-wide or watershed-wide basis in a manner that ensures attainment of water quality objectives and protection of beneficial uses. The most effective way to address salt and nutrient loading is typically through the development of regional or subregional salt and nutrient management plans rather than imposing requirements solely on individual recycled water projects or other individual sources of salts and nutrients.

6.1.3. *Basin evaluation.* To sustain the ongoing development of salt and nutrient management plans in basins where plans are needed and to clarify where salt and nutrient management planning is not needed, each regional water board shall evaluate each basin or subbasin in its region before April 8, 2021 and identify basins through a resolution or executive officer determination where salts and/or nutrients are a threat to water quality and therefore need salt and nutrient management planning to achieve water quality objectives in the long term. Each regional water board shall review and update this evaluation every five years to consider any changes in these factors that have occurred that would change the findings from the initial evaluation. Basin evaluations completed prior to April 8, 2019 can be used to satisfy this requirement if the prior evaluation clearly identifies whether the basin requires salt and nutrient management planning to achieve water quality objectives in the long term. Regional water boards shall consider the following factors in this determination, as well as any additional region-specific factors:

- Magnitude of and trends in the concentrations of salts and nutrients in groundwater
- Contribution of imported water and recycled water to the basin water supply
- Reliance on groundwater to supply the basin or subbasin
- Population
- Number and density of on-site wastewater treatment systems
- Other sources of salts and nutrients, including irrigated agriculture and confined animal facilities
- Hydrogeologic factors, such as regional aquitards, depth to water, and other basin- or subbasin-specific factors

6.2. Development and adoption of salt and nutrient management plans

6.2.1. The State Water Board encourages collaborative work among salt and nutrient management planning groups, the agricultural community, the regional water boards, Integrated Regional Water Management groups, and groundwater sustainability agencies formed under the Sustainable Groundwater Management Act to achieve the goals of groundwater sustainability, recycled water use, and water quality protection. For basins identified pursuant to 6.1.3, the State Water Board encourages local water suppliers, wastewater treatment agencies, and recycled water producers, together with local salt and nutrient contributing stakeholders, to continue locally driven and controlled, collaborative processes open to all stakeholders and the regional water board that will result in the development of salt and nutrient management plans for groundwater basins and the management of salts and nutrients on a basin-wide basis. The State Water Board also encourages stakeholders to incorporate the basin evaluation information developed by each regional water board, pursuant to 6.1.3, into the salt and nutrient management planning efforts.

6.2.1.1. Every groundwater basin and subbasin identified pursuant to 6.1.3 shall have a salt and nutrient management plan or a plan that is functionally equivalent pursuant to 6.2.1.4. Salt and nutrient management plans shall be tailored to address the water quality concerns of the basin and subbasin. Such plans shall include implementation measures, as appropriate, to address all sources of salt and/or nutrients to groundwater basins, including projects using recycled water for irrigation and groundwater recharge. The salt and nutrient management plans may address constituents other than salts and nutrients that adversely affect groundwater quality.

6.2.1.2. The State Water Board recognizes that because stormwater is typically lower in nutrients and salts and can augment local water supplies, inclusion of a significant stormwater use and recharge component within salt and nutrient management plans can play a vital role in the long-term sustainable use of water in California. Inclusion of stormwater recharge is consistent with the California Water Plan and the State Water Board Strategy to Optimize Resource Management of Stormwater (STORMS) vision, as adopted in State Water Board Resolution No. 2016-0003, that stormwater be managed as a resource, wherein water quality improvement and water supply enhancement are complementary goals.

6.2.1.3. Salt and nutrient management plans adopted as a Basin Plan amendment or accepted by the regional water board prior to April 8, 2019 shall be evaluated pursuant to 6.2.6 and 6.2.7 by April 8, 2024.

6.2.1.4. The regional water board may determine pursuant to 6.2.3 that a groundwater management plan for a basin, subbasin, or other regional planning area is functionally equivalent to a salt and nutrient management plan. For example, the regional water board may find that groundwater sustainability plans developed pursuant to the Sustainable Groundwater Management Act include water quality components that sufficiently address

the components of 6.2.4 and therefore are functionally equivalent to a salt and nutrient management plan.

6.2.1.5. The provisions in 6.2 are not intended to limit regional water board authority pursuant to Water Code section 13242 to adopt plans and programs of implementation for the protection of beneficial uses.

6.2.2. Implementation of salt and nutrient management plans may require a regional water board to amend its basin plan. The regional water board shall consider for adoption a basin plan amendment when implementation of a salt and nutrient management plan involves adoption and/or modification of water quality objectives, beneficial uses, or programs of implementation consistent with Water Code sections 13240, 13241, and 13242. In other cases where a regional water board determines a basin plan amendment is not required, the accepted salt and nutrient management plan serves as a technical document to support future regional water board decisions.

6.2.3. *Regional water board review and acceptance of salt and nutrient management plans.* Proposed salt and nutrient management plans shall be submitted to the regional water board for review. The regional water board shall evaluate the salt and nutrient management plan in accordance with the provisions of 6.2.4. Following review, the regional water board shall make one of the following determinations through a resolution. This determination shall be made within six months of receipt of a proposed salt and nutrient management plan, unless compliance with CEQA is required and the regional water board notifies the public of this within the six-month period.

6.2.3.1. The proposed salt and nutrient management plan does not satisfy the requirements of 6.2.4. In this case, the regional water board shall provide specific findings regarding which components in 6.2.4 are not adequately addressed and recommendations for what may need to be included or modified in the proposed salt and nutrient management plan for the regional water board to accept the plan.

6.2.3.2. The proposed salt and nutrient management plan satisfies the requirements of 6.2.4, a basin plan amendment is not needed to implement the plan, and the regional water board will accept the plan. In this case, the accepted salt and nutrient management plan will serve as a technical document to support future regional water board decisions.

6.2.3.3. The proposed salt and nutrient management plan satisfies the requirements of 6.2.4 and a basin plan amendment will be needed to implement the plan. In this case, the regional water board shall initiate a process to amend the basin plan based on the accepted salt and nutrient management plan and associated documentation.

6.2.4. *Required components of salt and nutrient management plans.* The degree of specificity within salt and nutrient management plans and the length of the plans will be dependent on a variety of site-specific factors, including but not limited to, size and complexity of a basin, source water quality, stormwater recharge,

hydrogeology, and aquifer water quality. Each salt and nutrient management plan shall include the following components:

6.2.4.1. A basin- or subbasin-wide monitoring plan that includes an appropriate network of monitoring locations to provide a reasonable, cost effective means of determining whether the concentrations of salts, nutrients, and other constituents of concern as identified in the salt and nutrient management plans are consistent with applicable water quality objectives. The number, type, and density of monitoring locations to be sampled and other aspects of the monitoring program shall be dependent upon basin-specific conditions and input from the regional water board. Salts, nutrients, and the constituents identified in 6.2.1.1 shall be monitored. The frequency of monitoring shall be proposed in the salt and nutrient management plan for review by the regional water board pursuant to 6.2.3.

6.2.4.1.1. The monitoring plan must be designed to effectively evaluate water quality in the basin. The monitoring plan must focus on water supply wells, areas proximate to large water recycling projects, particularly groundwater recharge projects, and other potential sources of salt and nutrients identified in the salt and nutrient management plan. Also, monitoring locations shall, where appropriate, target groundwater and surface waters where groundwater has connectivity with adjacent surface waters.

6.2.4.1.2. The monitoring plan may include water quality data from existing wells where the wells are located and screened appropriately to determine water quality throughout the most critical areas of the basin. The State Water Board supports monitoring approaches that leverage the use of groundwater monitoring wells from other regulatory programs, such as the Irrigated Lands Regulatory Program and the Sustainable Groundwater Management Act.

6.2.4.1.3. The monitoring plan shall identify those stakeholders responsible for conducting, compiling, and reporting the monitoring data. Where applicable, the regional water board will assist by encouraging other dischargers in the basin or subbasin to participate in the monitoring program. The data shall be electronically reported annually in a format that is compatible with a Groundwater Ambient Monitoring & Assessment (GAMA) information system and must be integrated into the GAMA information system or its successor.

6.2.4.2. Water recycling use goals and objectives.

6.2.4.3. Salt and nutrient source identification, basin or subbasin assimilative capacity and loading estimates, together with fate and transport of salts and nutrients.

6.2.4.4. Implementation measures to manage or reduce the salt and nutrient loading in the basin on a sustainable basis and the intended outcome of each measure.

6.2.4.5. An antidegradation analysis demonstrating that the existing projects, reasonably foreseeable future projects, and other sources of loading to the basin included within the plan will, cumulatively, satisfy the requirements of State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California (Antidegradation Policy).

6.2.5. Nothing in this Policy shall prevent stakeholders from developing a plan that is more protective of water quality than applicable standards in the basin plan. No regional water board, however, shall seek to modify basin plan objectives without compliance with Water Code section 13241.

6.2.6. *Data assessment.* The regional water boards, in consultation with stakeholders, shall assess and review monitoring data generated from these plans every five years, unless an alternate timeline has been established in a basin plan amendment. This assessment shall include an evaluation of:

- observed trends in water quality data as compared with trends predicted in the salt and nutrient management plan;
- the ability of the monitoring network to adequately characterize groundwater quality in the basin;
- potential new data gaps;
- groundwater quality impacts predicted in the salt and nutrient management plan based on most recent trends and any relied-upon models, including an evaluation of the ability of the model to simulate groundwater quality;
- available assimilative capacity based on observed trends and most recent water quality data; and
- projects that are reasonably foreseeable at the time of this data assessment but may not have been when the salt and nutrient management was prepared or last updated.

6.2.7. The regional water boards, in consultation with stakeholders, shall use the results of these periodic assessments to update basin evaluations of available assimilative capacity, projected trends, and concentrations of salts and nutrients in groundwater, and then determine whether potential updates or revisions to the salt and nutrient management plan may be warranted as a result of the data assessment or to make the plan consistent with the Policy.

7. Permitting and antidegradation analysis for non-potable recycled water projects

The purpose of this section is to describe permitting options and antidegradation analysis for non-potable recycled water projects when issuing a new or revised permit. Recycled water project proponents must also comply with related statutes and regulations, such as those contained in Water Code sections 13263, 13267, 13377, 13523, 13523.1, and California Code of Regulations, title 17 and title 22.

7.1. Use of statewide water reclamation requirements

The State Water Board has adopted statewide water reclamation requirements (e.g., Order WQ 2016-0068-DDW) to streamline permitting of recycled water projects where recycled water is used for non-potable uses.

7.1.1. To achieve the goals of statewide consistency, streamlined permitting, and efficiency of resource management, all appropriate and eligible projects with the capability of taking on the responsibility of administrating water recycling programs shall enroll under statewide water reclamation requirements.

7.1.2. *Antidegradation analysis.* Recycled water project proponents seeking to enroll under statewide water reclamation requirements can demonstrate compliance with the Antidegradation Policy by demonstrating that the project complies with the conditions of the order, which includes compliance with an accepted salt and nutrient management plan or participation in an existing salt and nutrient management planning effort, if directed by the State Water Board or applicable regional water board.

7.2. Site-specific permitting for non-potable recycled water projects

7.2.1. If a project is not appropriate or eligible to enroll under statewide water reclamation requirements, the regional water board shall consider a site-specific order for adoption or consider the project for enrollment under an existing order (e.g., a master recycling permit).

7.2.2. *Antidegradation analysis.* For non-potable recycled water projects ineligible or inappropriate for enrollment under statewide water reclamation requirements, project proponents must submit an antidegradation analysis to the regional water board with the report of waste discharge to demonstrate compliance with the Antidegradation Policy.

7.3. Salt and nutrient management plans and antidegradation analysis for non-potable recycled water projects

7.3.1. Irrigation and other non-potable uses of recycled water in accordance with this Policy is to the benefit of the people of the State of California. Nonetheless, the use of water for irrigation may, regardless of its source, affect groundwater quality.

7.3.2. *Basin plan amendment.* For non-potable recycled water project proponents within a basin with a basin plan amendment based on an accepted salt and nutrient

management plan, compliance with the Antidegradation Policy may be based, in part, on the technical findings of the salt and nutrient management plan or basin plan amendment, as applicable.

7.3.3. *Accepted but no basin plan amendment.* For non-potable recycled water project proponents within a basin with an accepted salt and nutrient management plan without an associated basin plan amendment, the antidegradation analysis may be based, in part, on the technical findings of the accepted salt and nutrient management plan as described in 6.2.2.

7.3.4. *No salt and nutrient management plan.* For non-potable recycled water project proponents within a basin where no salt and nutrient management plan is needed pursuant to 6.1.3 or where a salt and nutrient management plan has not yet been accepted by the regional water board, an antidegradation analysis shall be consistent with the permitting option selected by the regional water board as described in 7.1. and 7.2. If the proposed project is in a basin identified pursuant to 6.1.3. as needing a salt and nutrient management plan and if directed by a regional water board pursuant to Water Code section 13267, the recycled water project proponent may be required to develop or participate in developing a salt and nutrient management plan.

7.4. *Site-specific monitoring.* For non-potable recycled water projects, project-specific groundwater monitoring shall not be required if the criteria below are met, unless the regional water board determines there are unique site-specific conditions, or unless such project-specific monitoring is required under the accepted salt and nutrient management plan, applicable basin plan, or other Water Board program such as the Irrigated Lands Regulatory Program. Unique site-specific conditions include but are not limited to areas where recycled water is proposed to be used for irrigation over high transmissivity soils over a shallow (5' or less) high quality groundwater aquifer or proposed to be stored in unlined ponds where the regional water board determines that it will result in an unacceptable threat to groundwater quality. The criteria are:

7.4.1. For irrigation projects, application of recycled water at rates that minimize percolation of recycled water below the plants' root zone, i.e., in a manner (1) necessary to satisfy the plants' evapotranspiration requirements; (2) that considers allowances for supplemental water, irrigation distribution uniformity, leaching, and climate; and (3) when the soil is not saturated.

7.4.2. Appropriate use of fertilizers that accounts for the nutrient levels in the recycled water and nutrient demand by plants.

7.5. Incidental runoff of recycled water for irrigation

The incidental runoff of recycled water shall not result in water quality less than that prescribed in water quality control plans or policies, unless authorized through time schedule provisions in waste discharge requirements, waivers of waste discharge requirements, or conditional prohibitions (e.g., agricultural discharges from irrigated lands).

8. Permitting and antidegradation analysis for groundwater recharge projects

8.1. Permitting for groundwater recharge projects

8.1.1. All recycled water groundwater recharge projects must be reviewed and permitted on a site-specific basis.

8.1.2. Approved groundwater recharge projects shall meet the following criteria:

8.1.2.1. Compliance with regulations related to recycled water for groundwater recharge projects, including monitoring requirements for priority pollutants contained in California Code of Regulations, title 17 and California Code of Regulations, title 22 (including subsequent revisions), and recommendations by the State Water Board for the protection of public health pursuant to Water Code section 13523.

8.1.2.2. Implementation of a monitoring program for constituents of emerging concern (CECs) that is consistent with Attachment A and any recommendations from the State Water Board.

8.1.3. Nothing in this section shall be construed to limit the authority of a regional water board to protect designated beneficial uses, provided that any proposed limitations for the protection of public health may only be imposed following regular consultation by the regional water board with the State Water Board, consistent with the precedent established in State Water Board Orders WQ 2005-0007 and WQ 2006-0001.

8.1.4. Nothing in this Policy shall be construed to prevent a regional water board from imposing additional requirements for a proposed recharge project that has a substantial adverse effect on the fate and transport of a contaminant plume or changes the geochemistry of an aquifer thereby causing the dissolution of constituents, such as arsenic, from the geologic formation into groundwater.

8.1.5. Projects that utilize surface spreading to recharge groundwater with recycled water treated by reverse osmosis shall be permitted by a regional water board within one year of receipt of an approved Title 22 engineering report, provided that the project proposes a brine disposal method to the satisfaction of the regional water board. Furthermore, the regional water board shall give a high priority to review and approval of such projects.

8.2. Antidegradation analysis for groundwater recharge projects

8.2.1. Groundwater recharge with recycled water for later extraction and use in accordance with this Policy and state and federal water quality law is to the benefit of the people of the state of California. Nonetheless, groundwater recharge projects using recycled water have the potential to degrade water quality within a basin. To ensure a project does not degrade water quality within a basin, the proponent of a groundwater recharge project must submit an antidegradation analysis to the regional water board with the report of waste discharge to demonstrate compliance with the Antidegradation Policy.

8.2.2. For groundwater recharge projects within a basin with a basin plan amendment based on an accepted salt and nutrient management plan pursuant to 6.2.3.3, the antidegradation analysis may be based, in part, on the technical findings of the basin plan amendment.

8.2.3. For groundwater recharge projects within a basin with a salt and nutrient management plan accepted by the regional water board pursuant to 6.2.3.2 (i.e., without an associated basin plan amendment), the antidegradation analysis may be based, in part, on the technical findings of the accepted salt and nutrient management plan as described in 6.2.2.

8.2.4. If a groundwater recharge project proponent is actively participating in the development of a salt and nutrient management plan for the basin or subbasin to the satisfaction of the applicable regional water board, then compliance with the Antidegradation Policy may be demonstrated as follows:

8.2.4.1. If a groundwater recharge project proposes to utilize less than 10 percent of the available assimilative capacity in a basin or subbasin (or multiple projects to utilize less than 20 percent of the available assimilative capacity in a basin or subbasin), the antidegradation analysis need only demonstrate that the project will use less than 10 percent (or multiple projects will use less than 20 percent) of the available assimilative capacity. For those basins or subbasins where the regional water boards have not determined the baseline assimilative capacity, the baseline assimilative capacity shall be calculated by the initial project proponent, with review and approval by the regional water board, until the salt and nutrient management plan is accepted by the regional water board consistent with 6.2. For compliance with this subparagraph, the available assimilative capacity shall be calculated by comparing the mineral water quality objective with the representative concentration of the basin or subbasin as determined by the regional water board, either over the most recent five years of data available or using a data set approved by the regional water board. In determining whether the available assimilative capacity will be exceeded by the project or projects, the regional water board shall calculate the impacts of the project or projects over at least a ten-year time frame.

8.2.4.2. In the event a project or multiple projects utilize more than the fraction of the assimilative capacity designated in 8.2.4.1, then a more detailed antidegradation analysis shall be performed to comply with the Antidegradation Policy. The project proponent shall provide sufficient information for the regional water board to make this determination. An example of an approved method is the method used in State Water Board Resolution No. 2004-0060 and the regional water board in California Regional Water Quality Control Board, Santa Ana Region Resolution No. R8-2004-0001. An integrated approach (using surface water, groundwater, recycled water, stormwater, pollution prevention, water conservation, etc.) to the implementation of the Antidegradation Policy is encouraged.

8.2.5. For groundwater recharge projects within a basin without a salt and nutrient management plan accepted by the regional water board pursuant to 6.2.3, or any applicable basin plan amendment based on an accepted salt and nutrient management plan, or within a basin where no salt and nutrient management plan is needed pursuant to 6.1.3, a more detailed antidegradation analysis, as described in 8.2.4.2 shall be performed to comply with the Antidegradation Policy.

9. Permitting for reservoir water augmentation

9.1. All recycled water reservoir water augmentation projects must be reviewed and permitted on a site-specific basis.

9.2. Approved reservoir water augmentation projects shall meet the following criteria:

9.2.1. Compliance with regulations related to recycled water for reservoir water augmentation projects, including monitoring requirements for priority pollutants contained in California Code of Regulations, title 17 and California Code of Regulations, title 22 (including subsequent revisions); and

9.2.2. Implementation of a monitoring program for CECs that is consistent with Attachment A and recommendations by the State Water Board for the protection of public health pursuant to Water Code section 13523.

9.3. Nothing in this section shall be construed to limit the authority of a regional water board to protect designated beneficial uses, provided that any proposed limitations for the protection of public health may only be imposed following regular consultation by the regional water board with the State Water Board, consistent with the precedent established in State Water Board Orders WQ 2005-0007 and WQ 2006-0001.

10. Constituents of emerging concern

10.1. Introduction and need for research

10.1.1. The presence, variety, and concentration of CECs in water may vary over time. In addition, the state of knowledge regarding CECs is inherently incomplete and will change over time based on scientific developments. Continuing research is needed to support understanding of which CECs present a risk to public health and the environment.

10.1.2. Agencies shall employ source control and/or pollution prevention programs to minimize the likelihood of CECs impacting human health and the environment.

10.1.3. There is a need for additional research to: improve analytical methods and screening tools, increase the availability of toxicological studies, and improve our understanding of prevalence and persistence of CECs in water. This research will assist the State Water Board in identifying CECs with the greatest potential to be of toxicological relevance to human health and the environment.

10.2. Science Advisory Panel

10.2.1. The State Water Board will convene a Science Advisory Panel every five years to guide future actions relating to CECs.

10.2.2. The Panel shall be composed of members representing the following areas of expertise: human health toxicology, environmental toxicology, epidemiology, biochemistry, civil engineering (particularly the design and construction of water recycling treatment plants), analytical chemistry (particularly the design and operation of advanced laboratory methods for the detection of CECs), CEC sources and discharge pathways, and human health pathology (particularly antibiotic resistant bacteria and antibiotic resistance genes). Each panelist shall have extensive experience as a principal investigator in their respective area of expertise.

10.2.3. The Panel will review the scientific literature and submit a report to the State Water Board that describes the current state of scientific knowledge regarding the risks of CECs to public health and the environment.

10.2.4. Each report shall recommend actions that the State of California should take to improve our understanding of CECs and, as may be appropriate, to protect human health and the environment.

10.2.5. Each report shall at a minimum address the following topics:

10.2.5.1. The appropriate constituents to be monitored in recycled water, including analytical methods and reporting limits.

10.2.5.2. The known toxicological information for the above constituents and persistence through treatment systems.

10.2.5.3. Any change to the above constituents based on level of treatment and uses specified in Title 22 and for reservoir water augmentation.

10.2.5.4. The indicators or surrogates that can be used to represent a suite of CECs.

10.2.5.5. The concentrations of CECs that should trigger enhanced monitoring.

10.2.5.6. Recommendations regarding antibiotic resistant bacteria and antibiotic resistance genes.

10.2.6. Within six months from receipt of a report, the State Water Board will hold a hearing to consider recommendations from staff and will endorse the recommendations, as appropriate, after making any necessary modifications.

11. Maximizing consistency in permitting recycled water projects

11.1. CEC permit provisions

Permits for recycled water projects shall be consistent with any applicable monitoring requirements prescribed in Attachment A.

11.2. Regional water board general orders

To ensure consistent regulation of recycled water statewide,

11.2.1. On or after April 8, 2019, a regional water board may not enroll a recycled water project proponent under a regional water board general order for non-potable uses of recycled water issued prior to April 8, 2019.

11.2.2. If an enrollee under an existing regional water board general order for non-potable uses of recycled water has a Title 22 engineering report approved after January 1, 2001, the regional water board shall transition the enrollee to Order WQ 2016-0068-DDW or its successor, unless a site-specific order is more appropriate, before April 8, 2020.

11.2.3. Regional water boards shall transition all other enrollees from these orders to Order WQ 2016-0068-DDW or its successor, or a site-specific order as appropriate, before April 8, 2022.

11.2.4. Coverage under existing regional water board general orders for non-potable uses of recycled water will terminate on April 8, 2022 and, except for enforcement purposes, these orders will have no further force and effect.

11.3. Permit review

By April 8, 2022,

11.3.1. The State Water Board will review Title 22 engineering reports for recycled water permits issued prior to January 1, 2001 for consistency with all applicable regulations, including those related to recycled water contained in California Code of Regulations, title 17 and California Code of Regulations, title 22. If the Title 22 engineering report was never prepared or is inconsistent with applicable regulations, the State Water Board may require a new or updated Title 22 engineering report to be submitted for review and approval.

11.3.2. The regional water boards shall review all recycled water permits and shall update any recycled water permits and/or monitoring and reporting programs that are (1) inconsistent with this Policy; (2) inconsistent with an approved Title 22 engineering report pursuant to 11.3.1; or (3) inconsistent with the applicable regional water board basin plan. Regional water boards shall enroll permittees in Order WQ 2016-0068-DDW or its successor if appropriate.

11.3.3. The regional water boards shall prioritize updating orders, permits and/or monitoring and reporting programs that were issued prior to January 1, 2001 or are located in basins identified pursuant to 6.1.3.

11.3.4. The regional water boards shall periodically update permits for groundwater recharge and reservoir water augmentation consistent with the requirements for update of Title 22 engineering reports in California Code of Regulations, title 22.

11.3.5. Timelines consistent with a prioritized approach identified in a basin plan amendment based on an accepted salt and nutrient management plan pursuant to 6.2.3.3 will supersede the three-year timeline identified above in sections 11.3.1 through 11.3.3.

ATTACHMENT A

MONITORING REQUIREMENTS FOR CONSTITUENTS OF EMERGING CONCERN IN RECYCLED WATER USED FOR GROUNDWATER RECHARGE AND RESERVOIR WATER AUGMENTATION

The purpose of this attachment to the Policy is to provide direction to the regional water boards on monitoring requirements for constituents of emerging concern (CECs) in recycled water when permitting recycled water projects. The State Water Board developed the monitoring requirements and criteria for evaluating monitoring results considering recommendations from a Science Advisory Panel[1] and stakeholders.

The monitoring requirements in this attachment pertain only to the production and use of recycled water for groundwater recharge and reservoir water augmentation. CEC monitoring is not required for recycled water used for non-potable applications. The regional water boards shall issue permits consistent with this attachment except for water recycling treatment plants where the State Water Board has established site-specific CEC monitoring requirements such as:

- Groundwater recharge projects implementing treatment processes that provide control of CECs by processes other than soil aquifer treatment or reverse osmosis/advanced oxidation processes (RO/AOPs),
- Reservoir water augmentation projects implementing treatment processes that provide control of CECs by processes other than RO/AOPs.

The regional water boards shall not issue requirements for monitoring of additional CECs or bioanalytical screening in recycled water beyond the requirements provided in this Policy except when recommended by the State Water Board following the review of the Title 22 engineering report or when requested by the recycled water producer. However, the regional water boards can require other monitoring requirements consistent with their authorities.

[1] The Science Advisory Panel was convened in accordance with provision 10.2 of the Policy. The Panel's recommendations were presented in the report *Monitoring Strategies for Constituents of Emerging Concern (CECs) in Recycled Water – Recommendations of a Science Advisory Panel*, dated April 2018

1 QUALITY ASSURANCE PROJECT PLAN

The recycled water producer shall develop and maintain a quality assurance project plan (QAPP) for monitoring CECs to ensure the project data are of known, consistent, and documented quality and that the monitoring is consistent with this Policy. The QAPP shall be developed using the Guidance for Quality Assurance Project Plans, EPA QA/G-5 (EPA/240/R-2/009, 2002). The QAPP shall be submitted to the regional water board and approved by the regional water board or State Water Board prior to beginning any sampling and analysis. The QAPP shall be updated and re-submitted to the regional water board for approval when significant changes are made that would affect the overall data quality and use (e.g., using a new analytical chemistry laboratory) or at least annually if any changes are made. This attachment provides additional direction regarding specific components that must be considered when developing the QAPP.

1.1 Selection of Analytical Methods

Laboratories shall use analytical methods that have been validated and approved for the analytes in the applicable matrix and can achieve the reporting limits in Table 1 and Table 3. This includes methods that have been approved by U.S. EPA, the Standards Methods Committee, the American Society for Testing and Materials International, or other methods that have been validated and approved by the regional water boards or State Water Board for the analytes in the applicable matrix. The QAPP shall include minimum method validation requirements developed by the regional water board in consultation with the State Water Board if proposing to (1) use a method that has not been validated and approved, (2) use a validated and approved method that has been modified, or (3) use a method for an application that is outside the intended use of the method (e.g., different matrix, new analyte). The State Water Board and regional water board shall review the method validation package and must approve the method prior to use.

1.2 Laboratory Selection and Demonstrations of Competency

The regional water board in consultation with the State Water Board shall review the QAPP and determine if the selected laboratory(ies) has the competency to provide analytical testing for the project and can meet the performance criteria established in the QAPP. The regional water board in consultation with the State Water Board shall review the method detection limit studies and reporting limit verification data to ensure that the data meets the required reporting limits in Table 1 and Table 3.

A laboratory providing analyses of CECs and bioanalytical screening must hold a valid certificate of accreditation from the State of California Environmental Laboratory Accreditation Program (ELAP) for the analytical test methods or analytes selected, if such methods or analytes are accredited by ELAP at the time that monitoring is required to begin. If ELAP accreditation for analytical test methods or an analyte becomes available after monitoring is initiated, then the laboratory providing analysis of CECs shall be accredited by ELAP for those methods or analytes within one year of such accreditation becoming available. If ELAP accreditation is unavailable for a method or an analyte, the recycled water producer shall use a laboratory that has been accredited for a similar analytical method, instrumentation, or analyte

until ELAP accreditation becomes available, unless otherwise approved by the regional water board or State Water Board for bioanalytical screening tools.

1.3 Data Submission

Monitoring results required by this Policy shall be electronically reported to a database identified by the State Water Board.

The recycled water producer shall submit the quality assurance data specified in the QAPP, including percent recoveries and acceptable recovery ranges for each analyte, to the regional water board with each data set. The regional water board will review the data quality and may require additional actions if data quality objectives are not met.

2 CEC MONITORING PARAMETERS

The recycled water producer shall monitor for the constituents and parameters in this section (health-based CECs, performance indicator CECs, surrogates, and bioanalytical screening tools, collectively referred to as the CEC Monitoring Parameters) as listed in Table 1, Table 2, and Table 3 at monitoring locations specified in section 3 of Attachment A, and at a frequency specified in section 4 of Attachment A. Sections 5.2 and 5.3 of Attachment A include a method for evaluating monitoring results for health-based CECs and bioanalytical screening tools and the associated response actions.

2.1 Health-based CECs and Performance Indicator CECs

[See next page for *Table 1. Health-based and performance indicator CECs with the required reporting limits*.]

Table 1: Health-based and performance indicator CECs and required reporting limits.

Constituent	Constituent Group	Relevance/Indicator Type	Reporting Limit[1] (µg/L)
GROUNDWATER RECHARGE - SURFACE APPLICATION			
1,4-Dioxane	Industrial chemical	Health	0.1
N-Nitrosodimethylamine (NDMA)	Disinfection byproduct	Health	0.002
N-Nitrosomorpholine (NMOR)	Industrial chemical	Health	0.002
Perfluorooctane sulfonate (PFOS)	Consumer/industrial chemical	Health	0.0065
Perfluorooctanoic acid (PFOA)	Consumer/industrial chemical	Health	0.007
Gemfibrozil	Pharmaceutical	Performance	0.01
Iohexol	Pharmaceutical	Performance	0.05
Sucralose	Food additive	Performance	0.1
Sulfamethoxazole	Antibiotic	Performance	0.01
RESERVOIR WATER AUGMENTATION AND GROUNDWATER RECHARGE - SUBSURFACE APPLICATION			
1,4-Dioxane	Industrial chemical	Health	0.1
NDMA	Disinfection byproduct	Health & Performance	0.002
NMOR	Industrial chemical	Health	0.002
PFOS	Consumer/industrial chemical	Health	0.0065
PFOA	Consumer/industrial chemical	Health	0.007
Sucralose	Food additive	Performance	0.1
Sulfamethoxazole	Antibiotic	Performance	0.01

[1] The regional water board may approve higher reporting limits if it determines these reporting limits cannot be practicably met in recycled water sample matrices using existing methods, as long as the ratio between the reporting limit and the monitoring trigger limit (see Table 7) is no less than 2. µg/L – micrograms per liter.

2.2 Surrogates for CECs

Table 2 presents a list of surrogates that shall be considered for monitoring treatment efficacy of recycled water used for groundwater recharge and reservoir water augmentation. Other surrogates not listed in

Table 2 may also be considered. The recycled water producer shall identify surrogates to monitor that are indicative of removal of CECs through individual unit processes or combinations of unit processes at the water recycling treatment plant. The regional water board in consultation with the State Water Board shall review and approve the selected surrogates for each water recycling treatment plant. The list of surrogates may be revised throughout the phased monitoring approach described in section 4 of Attachment A.

Where applicable, surrogates may be measured using on-line or hand-held instruments provided instrument calibration procedures are implemented in accordance with the manufacturer's specifications and that calibration is documented.

Table 2: Surrogates for CECs

GROUNDWATER RECHARGE - SURFACE APPLICATION
Ammonia
Dissolved Organic Carbon (DOC)
Nitrate
Total fluorescence
Ultraviolet (UV) Light Absorbance
RESERVOIR WATER AUGMENTATION AND GROUNDWATER RECHARGE - SUBSURFACE APPLICATION
Electrical Conductivity
DOC
UV Light Absorbance

2.3 Bioanalytical Screening Tools for CECs

Table 3: Bioanalytical screening tools for CECs and required reporting limits

Endpoint Activity	Example Relevant CECs	Adverse effect	Reporting Limit (ng/L)
RESERVOIR WATER AUGMENTATION AND GROUNDWATER RECHARGE – SURFACE AND SUBSURFACE APPLICATION			
Estrogen receptor-α (ER-α)	Estradiol, bisphenol A, nonylphenol	Feminization, impaired reproduction, cancer	0.5
Aryl hydrocarbon receptor (AhR)	Dioxin-like chemicals, polycyclic aromatic hydrocarbons, pesticides	Cancer, impaired reproduction	0.5

3 MONITORING LOCATIONS

The recycled water producer shall monitor for the CEC Monitoring Parameters in section 2 of Attachment A at the monitoring locations specified in this section.

3.1 Groundwater Recharge - Surface Application

For groundwater recharge projects implementing surface application of recycled water, bioanalytical screening and monitoring for health-based CECs, performance indicator CECs, and surrogates shall be performed at these locations:

(1) Following tertiary treatment[2] prior to application to the surface spreading area; and

(2) At monitoring well locations designated in consultation with the State Water Board within the distance groundwater travels downgradient from the application site in 30 days.

3.2 Groundwater Recharge - Subsurface Application

3.2.1 *Monitoring Locations for Health-Based CECs and Bioanalytical Screening*

For groundwater recharge projects implementing subsurface application of recycled water, bioanalytical screening and monitoring for health-based CECs shall be performed at a location following treatment prior to release into the aquifer.

3.2.2 *Monitoring Locations for Performance Indicator CECs and Surrogates*

For groundwater recharge projects using subsurface application of recycled water, performance indicator CECs shall be monitored in recycled water at these locations:

(1) Prior to treatment by RO; and

(2) Following treatment prior to release into the aquifer.

If the recycled water producer can demonstrate that the RO unit will not substantially remove a CEC, the regional water board may allow monitoring for that CEC prior to the AOPs, instead of prior to the RO unit.

For groundwater recharge projects using subsurface application of recycled water, surrogates shall be monitored at locations proposed by the recycled water producer and approved by the regional water board in consultation with the State Water Board.

[2] Standards for disinfected tertiary recycled water presented in California Code of Regulations, title 22, section 60301.230 and 60301.320.

3.3 Reservoir Water Augmentation

3.3.1 *Monitoring Locations for Health-Based CECs and Bioanalytical Screening*

For reservoir water augmentation projects, bioanalytical screening and monitoring for health-based CECs shall be performed at a location following treatment prior to release into the surface water reservoir.

3.3.2 *Monitoring Locations for Performance Indicator CECs and Surrogates*

For reservoir water augmentation projects, performance indicator CECs shall be monitored in recycled water at these locations:

(1) Prior to treatment by RO; and

(2) Following treatment prior to release into the surface water reservoir.

If the recycled water producer can demonstrate that the RO unit will not substantially remove a CEC, the regional water board may allow monitoring for that CEC prior to the AOPs, instead of prior to the RO unit. For reservoir water augmentation projects, surrogates shall be monitored at locations proposed by the recycled water producer and approved by the regional water board in consultation with the State Water Board.

4 PHASED MONITORING REQUIREMENTS

For each water recycling treatment plant, the recycled water producer shall conduct a three-phased monitoring approach for the CEC Monitoring Parameters, which includes an initial assessment monitoring phase, followed by a baseline monitoring phase, and then a standard operation monitoring phase. Additional details of the three-phased monitoring approach are provided below. The purpose of phased monitoring is to allow the regional water board to review the monitoring results for the CEC Monitoring Parameters at the various phases and refine the specific monitoring requirements based on the monitoring results and findings of the previous phase.

A recycled water producer may submit existing CEC monitoring data for the health-based CECs and performance indicator CECs, surrogates for CECs, and bioanalytical screening tools from a water recycling treatment plant with a State Water Board-approved Title 22 engineering report to the regional water board to satisfy the requirements in the initial assessment or baseline monitoring phase. If the regional water board, in consultation with the State Water Board, determines the existing CEC monitoring data meet the intent of the initial assessment phase (section 4.1 below), it may allow a recycled water producer to initiate the baseline monitoring phase (section 4.2 below). If the regional water board, in consultation with the State Water Board, determines the existing CEC monitoring data meet the intent of the baseline monitoring phases, the recycled water producer can initiate the standard operation monitoring phase. All facilities must conduct the standard operation monitoring phase.

4.1 Initial Assessment Monitoring Phase

The monitoring requirements for the initial assessment monitoring phase shall apply to the start-up of new water recycling treatment plants, piloting of new unit processes at existing facilities, and existing facilities where the regional water board, in consultation with the State Water Board, determines that CECs, surrogates, and bioanalytical screening tools have not been assessed consistent with the requirements of this attachment.

The purpose of the initial assessment phase is to: (1) identify the occurrence of health-based CECs, performance indicator CECs, and surrogates in recycled water for groundwater recharge or reservoir water augmentation; (2) determine treatment effectiveness; (3) define the project-specific performance indicator CECs and surrogates to monitor during the baseline monitoring phase; (4) specify the expected removal percentages for performance indicator CECs and surrogates; and (5) gather bioactivity data for ER-α and AhR bioanalytical screening tools to determine the range of responses for the bioassays for standardized water quality monitoring. The Initial Assessment Phase shall be conducted after the water recycling treatment plant has received approval from the State Water Board for the facility's Title 22 engineering report.

The recycled water producer shall monitor for the constituents in section 2 of Attachment A consistent with the initial assessment phase requirements. Following completion of the initial assessment monitoring phase for each water recycling treatment plant, the regional water board, in consultation with the State Water Board, shall evaluate the data from the initial assessment monitoring phase and determine the appropriate monitoring requirements for the baseline monitoring phase.

4.1.1 *Initial Assessment Monitoring for Health-Based CECs, Performance Indicator CECs, and Surrogates*

4.1.1.1 The recycled water producer shall conduct an initial assessment monitoring phase consistent with Table 4 for a period of one year for each of the health-based CECs and performance indicator CECs listed in Table 1 and project-specific surrogates identified per section 2.2 of Attachment A.

4.1.1.2 The recycled water producer shall evaluate data from performance indicator CECs and surrogates and prepare an updated Table 7 with the expected (rather than example) removal percentages for the water recycling treatment plant and submit to the regional water board with the initial assessment monitoring data.

4.1.1.3 Following each sampling event, the recycled water producer shall evaluate monitoring results for health-based CECs using the direction in section 5.2 of Attachment A and implement appropriate response actions. The recycled water producer shall also evaluate monitoring results for surrogates and evaluate the suitability of the surrogates.

4.1.2 *Initial Assessment Monitoring for Bioanalytical Screening Tools*

4.1.2.1 The recycled water producer shall initiate the initial assessment phase by April 8, 2020. The recycled water producer shall conduct an initial assessment monitoring phase consistent with Table 4 for a period of three years for each of the bioanalytical screening tools listed in Table 3 (i.e., ER-α and AhR).

4.1.2.2 Following each sampling event, the recycled water producer shall evaluate monitoring results for bioanalytical screening tools. The recycled water producer may elect to follow the response actions for bioanalytical screening tools using the direction in section 5.2 of Attachment A, but implementation of the response actions during the initial assessment monitoring phase is not required.

[See next page for *Table 4. Initial Assessment Monitoring Phase Requirements*]

Table 4: Initial Assessment Monitoring Phase Requirements

Recycled Water Use	Constituent	Frequency	Monitoring Point
Groundwater Recharge - Surface Application	Health-Based CECs and Performance Indicator CECs: All listed in Table 1.	Quarterly[1]	- Following tertiary treatment prior to application to surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
	Surrogates: To be selected on a project-specific basis (see 2.2), considering those listed in Table 2.	1st 3 months: To be determined on a project-specific basis.[3]	- Following tertiary treatment prior to application to the surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
		3-12 months: To be determined on a project- specific basis.[3]	- Following tertiary treatment prior to application to the surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
	Bioanalytical Screening Tools: All listed in Table 3.	Quarterly[1]	- Following tertiary treatment prior to application to surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
Reservoir Water Augmentation and Groundwater Recharge - Subsurface Application	Health-Based CECs: All listed in Table 1.	Quarterly[1]	Following treatment prior to release to the aquifer or surface water reservoir.
	Performance Indicator CECs: All listed in Table 1.	Quarterly[1]	- Prior to RO treatment.[4] - Following treatment prior to release to the aquifer or surface water reservoir.
	Surrogates: To be selected on a project-specific basis (see 2.2), considering those listed in Table 2.	To be determined on a project-specific basis.	At locations approved by the regional water board.[5]
	Bioanalytical Screening Tools: All listed in Table 3.	Quarterly[1]	Following treatment prior to release to the aquifer or surface water reservoir.

[1] This is the initial monitoring frequency for the monitoring and reporting program. The regional water board may require additional monitoring to respond to a concern as stated in 4.1 of Attachment A.
[2] Groundwater within the distance groundwater travels downgradient from the application site in 30-days.
[3] The monitoring frequency shall be determined by the regional water board in consultation with the State Water Board. The intent is to have an increased monitoring frequency during the first three months and a decreased monitoring frequency after three months.
[4] If the recycled water producer can demonstrate that the RO unit will not substantially remove a CEC, the regional water board may allow monitoring for that CEC prior to the AOP, instead of prior to the RO unit.
[5] See 3.2.2 of Attachment A for information on surrogate monitoring locations for subsurface application and 3.3.2 of Attachment A for reservoir water augmentation.

4.2 Baseline Monitoring Phase

A recycled water producer shall initiate the baseline monitoring phase upon completion of the initial assessment phase or upon receiving approval from the regional water board to proceed with this phase given the existing data for the water recycling treatment plant meet the intent of the initial assessment phase.

The purpose of the baseline monitoring phase is to: (1) gather occurrence data for health-based CECs; (2) evaluate performance indicator CECs and surrogates and determine treatment effectiveness; (3) gather bioactivity data for ER-α and AhR bioanalytical screening tools and pilot test the framework for response actions; and (4) assess the list of health-based CECs, performance indicator CECs, surrogates, and bioanalytical screening tools and identify an appropriate list of constituents to monitor the removal of CECs and treatment system performance in the standard operation monitoring phase of a water recycling treatment plant.

4.2.1 *Baseline Monitoring for Health-Based CECs, Performance Indicator CECs, and Surrogates*

4.2.1.1 The recycled water producer shall conduct a baseline monitoring phase consistent with Table 5 for a period of three years for each of the health-based CECs in Table 1, and performance-based CECs and surrogates identified by the regional water board in consultation with the State Water Board.

4.2.1.2 The regional water board shall evaluate the performance indicator CEC and surrogate data from the initial assessment phase. Performance indicator CECs and surrogates that exhibited reduction by unit processes and/or provided an indication of operational performance shall be selected for monitoring in the baseline monitoring phase. Surrogates not reduced through a unit process are not good indicators of the unit's intended performance. For example, soil aquifer treatment may not effectively lower electrical conductivity. Therefore, electrical conductivity may not be a good surrogate for soil aquifer treatment.

4.2.1.3 If a performance indicator CEC listed in Table 1 is not a good indicator of CEC removal, the recycled water producer shall propose an alternative performance indicator CEC to monitor that is representative of the constituent group. This performance indicator CEC shall be subject to approval by the regional water board in consultation with the State Water Board.

4.2.1.4 The recycled water producer shall evaluate data from performance indicator CECs and surrogates and prepare an updated Table 7 with the expected (rather than example) removal percentages for the water recycling treatment plant and submit to the regional water board with the baseline monitoring data.

4.2.1.5 Following each sampling event, the recycled water producer shall evaluate monitoring results for health-based CECs using the direction in section 5.2 of Attachment A and implement appropriate response actions.

4.2.2 *Baseline Monitoring for Bioanalytical Screening Tools*

4.2.2.1 The recycled water producer shall conduct a baseline monitoring phase consistent with Table 5 for a period of one year for each of the bioanalytical screening tools listed in Table 3.

4.2.2.2 Following each sampling event, the recycled water producer shall evaluate monitoring results for bioanalytical screening tools using the direction in section 5.3 of Attachment A and implement appropriate response actions.

[See next page for *Table 5: Baseline Phase Monitoring Requirements*]

Table 5: Baseline Monitoring Phase Requirements

Recycled Water Use	Constituent	Frequency	Monitoring Point
Groundwater Recharge – Surface Application	Health-Based CECs: All listed in Table 1. Performance Indicator CECs: Selected based on the findings of the initial assessment phase.	Semi-Annually[1]	- Following tertiary treatment prior to application to the surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
	Surrogates: Selected based on the findings of the initial assessment phase.	Based on findings of the initial assessment phase.	- Following tertiary treatment prior to application to the surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
	Bioanalytical Screening Tools: All listed in Table 3.	Quarterly[1]	- Following tertiary treatment prior to application to the surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
Reservoir Water Augmentation and Groundwater Recharge – Subsurface Application	Health-Based CECs: All listed in Table 1.	Semi-Annually[1]	Following treatment prior to release to the aquifer or surface water reservoir.
	Performance Indicator CECs: Selected based on the findings of the initial assessment phase.	Semi-Annually[1]	- Prior to RO treatment.[3] - Following treatment prior to release to the aquifer or surface water reservoir.
	Surrogates: Selected based on the findings of the initial assessment phase.	Based on findings of the initial assessment phase.	- At locations approved by the regional water board.[4]
	Bioanalytical Screening Tools: All listed in Table 3.	Quarterly[1]	Following treatment prior to release to the aquifer or surface water reservoir.

[1] More frequent monitoring may be required to respond to a concern as stated in 4.2 of Attachment A.
[2] Groundwater within the distance groundwater travels downgradient from the application site in 30-days.
[3] If the recycled water producer can demonstrate that the RO unit will not substantially remove a CEC, the regional water board may allow monitoring for that CEC prior to the AOP, instead of prior to the RO unit.
[4] See 3.2.2 of Attachment A for information on surrogate monitoring locations for subsurface application and 3.3.2 of Attachment A for reservoir water augmentation.

4.3 Standard Operation Monitoring Phase

A recycled water producer shall initiate the standard operation monitoring phase upon completion of the baseline monitoring phase or upon receiving approval from the regional water board to proceed with this phase given the existing data for the water recycling treatment plant.

The purpose of the standard operation monitoring phase is to monitor CECs under standard operating conditions at a water recycling treatment plant. In this phase, the regional water board in consultation with the State Water Board will identify a list of health-based CECs, performance-based CECs, surrogates, and bioanalytical screening tools to monitor based on the water recycling treatment plant's data from the first two monitoring phases.

4.3.1 *Standard Operation Monitoring for Health-Based CECs, Performance Indicator CECs, and Surrogates*

4.3.1.1 For the standard operation monitoring phase, the recycled water producer shall conduct the monitoring requirements in Table 6 while the facility is operating.

4.3.1.2 The regional water board, in consultation with the State Water Board, may remove a health-based CEC from the required monitoring list if the monitoring results meet the conditions of the minimum threshold level presented in Table 8.

4.3.1.3 Performance indicator CECs and surrogates that exhibited reduction by a unit process and/or provided an indication of operational performance shall be selected for monitoring of standard operations. If a performance indicator CEC is not a good indicator, the recycled water producer shall propose an alternative performance indicator CEC representative of the constituent group to monitor. This performance indicator CEC shall be subject to approval by the regional water board in consultation with the State Water Board.

4.3.1.4 Monitoring for health-based CECs and performance indicator CECs shall be conducted on a semi-annual basis, unless the project demonstrates consistency in treatment effectiveness in removal of CECs, treatment operational performance, and appropriate recycled water quality. These projects may be monitored for health-based CECs and performance indicator CECs on an annual basis.

4.3.1.5 Following each sampling event, the recycled water producer shall evaluate monitoring results for health-based CECs using the direction in section 5.2 of Attachment A and implement appropriate response actions.

4.3.1.6 If evaluation of monitoring results indicates a concern, such as finding a health-based CEC above the thresholds described in Table 7 or a decline in removal of a performance indicator CEC from the performance levels established during the initial and baseline monitoring phases, the regional water board in consultation with the State Water Board may require more frequent monitoring to further evaluate the effectiveness of the treatment process. Additional actions may also be warranted, which may include, but are not limited to, resampling to confirm a result, additional monitoring, implementation of a source identification program, toxicological studies, engineering removal studies, and/or modification of facility operation. If additional monitoring is required, the regional water board shall consult with the State Water Board and revise the Monitoring and Reporting Program as appropriate.

4.3.2 *Standard Operation Monitoring for Bioanalytical Screening Tools*

4.3.2.1 The regional water board, in consultation with the State Water Board, may remove a bioanalytical screening tool from the required monitoring list if monitoring results meet the conditions of the minimum threshold level presented in Table 10.

4.3.2.2 Following each sampling event where bioassay monitoring is required, the recycled water producer shall evaluate monitoring results for bioanalytical screening tools using the direction in section 5.2 of Attachment A and implement appropriate response actions.

4.3.2.3 Monitoring for bioanalytical screening tools shall be conducted on a semi-annual basis, unless the project demonstrates consistency in treatment effectiveness in removal of CECs, treatment operational performance, and appropriate recycled water quality. These projects may be monitored for CECs and with bioanalytical screening tools on an annual basis. Monitoring frequencies for CECs and surrogates for standard operation monitoring are specified in Table 6.

Table 6: Standard Operation Monitoring Requirements

Recycled Water Use	Constituent	Frequency	Monitoring Point
Groundwater Recharge - Surface Application	Health-Based CECs: Selected based on the findings of the baseline phase.	Semi-Annually or Annually[1]	- Following tertiary treatment prior to application to the surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
	Performance Indicator CECs: Selected based on the findings of the baseline phase.		
	Surrogates: Selected based on the findings of the baseline phase.	Based on findings of the baseline phase.	- Following tertiary treatment prior to application to the surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
	Bioanalytical Screening Tools: Selected based on the findings of the baseline phase.	Semi-Annually or Annually[1]	- Following tertiary treatment prior to application to the surface spreading area. - At monitoring well locations designated in consultation with the State Water Board.[2]
Reservoir Water Augmentation and Groundwater Recharge - Subsurface Application	Health-Based CECs: Selected based on the findings of the baseline phase.	Semi-Annually or Annually[1]	-Following RO/AOPs treatment prior to release to the aquifer or surface water reservoir.
	Performance Indicator CECs: Selected based on the findings of the baseline phase.	Semi-Annually or Annually[1]	- Prior to RO treatment.[3] - Following treatment prior to release to the aquifer or surface water reservoir.
	Surrogates: Selected based on the findings of the baseline phase.	Based on findings of the baseline phase.	At locations approved by the regional water board.[4]
	Bioanalytical Screening Tools: Selected based on the findings of the baseline phase.	Semi-Annually or Annually[1]	Following treatment prior to release to the aquifer or surface water reservoir.

[1] More frequent monitoring may be required to respond to a concern as stated in 4.3 of Attachment A.
[2] Groundwater within the distance groundwater travels downgradient from the application site in 30-days.
[3] If the recycled water producer can demonstrate that the RO unit will not substantially remove a CEC, the regional water board may allow monitoring for that CEC prior to the AOP, instead of prior to the RO unit.
[4] See 3.2.2 of Attachment A for information on surrogate monitoring locations for subsurface application and 3.3.2 of Attachment A for reservoir water augmentation.

5 EVALUATION OF CECs, SURROGATES, AND BIOANALYTICAL SCREENING TOOL MONITORING RESULTS

This section describes the approaches for evaluating treatment process performance and health-based CEC and bioanalytical screening tool monitoring results. Monitoring results for performance indicator CECs and surrogates shall be used to evaluate the operational performance of a treatment process and the effectiveness of a treatment process in removing CECs. For evaluation of health-based CEC and bioanalytical screening tool monitoring results, a multi-tiered approach of thresholds and corresponding response actions is specified in 5.2 and 5.3 of Attachment A, respectively. The evaluation of monitoring results shall be included in monitoring reports submitted to the regional water board.

5.1 Evaluation of Performance Indicator CEC and Surrogate Results

The effectiveness of a treatment process to remove CECs shall be evaluated by determining the removal percentages for performance indicator CECs and surrogates. The removal percentage is the difference in the concentration of a compound in recycled water prior to and after a treatment process (e.g., soil aquifer treatment or RO followed by AOPs), divided by the concentration prior to the treatment process and multiplied by 100.

Removal Percentage = $([X_{in} – X_{out}]/X_{in})$ (100)

X_{in} - Concentration in recycled water prior to a treatment process
X_{out} - Concentration in recycled water after a treatment process

During the initial assessment, the recycled water producer shall monitor performance to determine removal percentages for performance indicator CECs and surrogates. The removal percentages shall be confirmed during the baseline monitoring phase. One example of removal percentages for each application scenario and their associated processes (i.e., soil aquifer treatment or RO/AOPs) is presented in Table 7. The established removal percentages for each project shall be used to evaluate treatment effectiveness and operational performance.

5.1.1 *Groundwater Recharge – Surface Application*

For groundwater recharge by surface application, the removal percentage shall be determined by comparing the quality of the recycled water applied to a surface spreading area to the quality of groundwater at monitoring wells. The distance between the application site and the monitoring wells shall be no more than the distance the groundwater travels in 30 days downgradient from the application site. The location of the monitoring wells shall be designated by the regional water board in consultation with the State Water Board. The removal percentage shall be adjusted to account for differences in concentrations due to dilution from potable water applied to the application site, stormwater applied to the application site, and native groundwater. The removal percentage shall also be adjusted to account for CECs in these waters. The recycled water producer shall submit a proposal to the regional water board and the State Water Board as part of its operation plan describing how it will perform this accounting.

5.1.2 *Groundwater Recharge – Subsurface Application*

For groundwater recharge using subsurface application, the removal percentage shall be determined by comparing the CEC Monitoring Parameters before treatment by RO/AOPs and after treatment prior to release into the aquifer.

5.1.3 *Reservoir Water Augmentation*

For reservoir water augmentation, the removal percentage shall be determined by comparing the CEC Monitoring Parameters before treatment by RO/AOPs and after treatment prior to release into the surface water reservoir.

5.2 Evaluation of Health-Based CEC Results

The recycled water producer shall evaluate health-based CEC monitoring results. To determine the appropriate response actions, the recycled water producer shall compare measured environmental concentrations (MECs) to their respective monitoring trigger levels[3] (MTLs) listed in Table 7 to determine MEC/MTL ratios. The recycled water producer shall compare the calculated MEC/MTL ratios to the thresholds specified in Table 8 and implement the response actions corresponding to the threshold.

For surface application, the recycled water producer shall evaluate the health-based CEC results for samples collected from the groundwater monitoring wells. For subsurface application and reservoir water augmentation projects, the recycled water producer shall evaluate the health-based CEC results for the recycled water following treatment prior to release into the aquifer or surface water reservoir.

[See next page for *Table 7. Monitoring Trigger Levels and Example Removal Percentages*]

[3] Recommended MTLs were established in *Monitoring Strategies for Constituents of Emerging Concern (CECs) in Recycled Water – Recommendations of a Science Advisory Panel*, dated April 2018.

Table 7: Monitoring Trigger Levels and Example Removal Percentages

Constituent/ Parameter	Relevance/Indicator Type/Surrogate	Monitoring Trigger Level (micrograms/liter)[1]	Example Removal Percentages (%)[2]
GROUNDWATER RECHARGE - SURFACE APPLICATION[3]			
1,4-Dioxane	Health	1	--[4]
NDMA	Health	0.010	--
NMOR	Health	0.012	--
PFOS	Health	0.013	--
PFOA	Health	0.014	--
Gemfibrozil	Performance	--	>90
Iohexol	Performance	--	>90
Sucralose	Performance	--	<25[5]
Sulfamethoxazole	Performance	--	>30
Ammonia	Surrogate	--	>90
DOC	Surrogate	--	>30
Nitrate	Surrogate	--	>30
Total fluorescence	Surrogate	--	>30
UV Absorbance	Surrogate	--	>30
RESERVOIR WATER AUGMENTATION AND GROUNDWATER RECHARGE - SUBSURFACE APPLICATION[6]			
1,4-Dioxane	Health	1	--
NDMA	Health & Performance	0.010	25-50, >80[7]
NMOR	Health	0.012	--
PFOS	Health	0.013	--
PFOA	Health	0.014	--
Sucralose	Performance	--	>90
Sulfamethoxazole	Performance	--	>90
Electrical Conductivity	Surrogate	--	>90
DOC	Surrogate	--	>90
UV Absorbance	Surrogate	--	>50

[1] Recommended monitoring trigger levels for groundwater recharge and reservoir water augmentation applications were established in *Monitoring Strategies for Constituents of Emerging Concern (CECs) in Recycled Water – Recommendations of a Science Advisory Panel*, dated April 2018.

[2] The removal percentages are from Drewes et al. (2008) and provide an example of performance for that specific research. Project-specific removal percentages will be developed for each project during the initial and baseline monitoring phases.

[3] Treatment process: Soil aquifer treatment. The stated removal percentages are examples and need to be finalized during the initial and baseline monitoring phases for a given site.

[4] Not applicable

[5] Sucralose degrades poorly during soil aquifer treatment. It is included here mainly as a tracer. [6] Treatment process: RO/AOP.

[7] For treatment using RO, removal percentage is between 25 and 50 percent. For treatment using RO/AOP, removal percentage is greater than 80 percent.

Table 8: MEC/MTL Thresholds and Response Actions for Health-based CECs

MEC/MTL Threshold	Response Action[1]
If greater than 75 percent of the MEC/MTL ratio results for a CEC are less than or equal to 0.1 during the baseline monitoring phase and/or subsequent monitoring	A) After completion of the baseline monitoring phase, consider requesting removal of the CEC from the monitoring program.
If MEC/MTL ratio is greater than 0.1 and less than or equal to 1	B) Continue to monitor.
If MEC/MTL ratio is greater than 1 and less than or equal to 10	C) Check the data. Continue to monitor.
If MEC/MTL ratio is greater than 10 and less than or equal to 100	D) Check the data, resample within 72 hours of notification of the result and analyze to confirm CEC result. Continue to monitor.
If MEC/MTL ratio is greater than 100	E) Check the data, resample within 72 hours of notification of the result and analyze to confirm CEC result. Continue to monitor. Contact the regional water board and the State Water Board to discuss additional actions. (Additional actions may include, but are not limited to, additional monitoring, toxicological studies, engineering removal studies, modification of facility operation, implementation of a source identification program, and monitoring at additional locations.)

[1] If a CEC also has a notification level, additional follow-up monitoring may be required by the State Water Board or regional water board per requirements in California Code of Regulations, title 22.

5.3 Evaluation of Bioanalytical Screening Tool Results

The recycled water producer shall evaluate bioanalytical assay monitoring results. During the baseline monitoring phase and standard operation monitoring phase, the recycled water producer shall determine the appropriate response actions. The recycled water producer shall compare bioanalytical equivalent concentrations (BEQs) to their respective MTLs listed in Table 9 to determine BEQ/MTL ratios. The recycled water producer shall compare the calculated BEQ/MTL ratios to the thresholds presented in Table 10 and implement the response actions corresponding to the threshold.

For groundwater recharge - surface application, the recycled water producer shall evaluate the bioanalytical screening results for samples collected from the groundwater monitoring wells. For groundwater recharge - subsurface application and reservoir water augmentation projects, the recycled water producer shall evaluate the bioanalytical screening results for the recycled water following treatment prior to release to the aquifer or surface water reservoir.

Table 9: Required Equivalency Agonists and Monitoring Trigger Levels for Bioanalytical Screening Tools

Constituent/ Parameter	Equivalency Agonist	Monitoring Trigger Level (nanograms/liter)[1]
Estrogen receptor-α (ER-α)	17-beta-estradiol	3.5
Aryl hydrocarbon receptor (AhR)	2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)	0.5

[1] The MTL for ER-α represents a health-based MTL. The MTL for AhR represents a level which may or may not be indicative of a health-based effect due to the wide variation in health-based predicted no-effect concentrations of agonists.

Table 10: BEQ/MTL Thresholds and Response Actions for Bioanalytical Screening Tools

BEQ/MTL Threshold	Response Action
If BEQ/MTL ratio is consistently less than or equal to 0.15 for ER-α or 1.0 for AhR	A) After completion of the baseline monitoring phase, consider decreasing monitoring frequency or requesting removal of the endpoint from the monitoring program.
If BEQ/MTL ratio is greater than 0.15 and less than or equal to 10 for ER-α or greater than 1.0 and less than or equal to 10 for AhR	B) Continue to monitor.
If BEQ/MTL ratio is greater than 10 and less than or equal to 1000	C) Check the data, resample within 72 hours of notification of the result and analyze to confirm bioassay result. Continue to monitor. Contact the regional water board and State the Water Board to discuss additional actions, which may include, but are not limited to, targeted analytical chemistry monitoring, increased frequency of bioassay monitoring, and implementation of a source identification program.
If BEQ/MTL ratio is greater than 1000	D) Check the data, resample within 72 hours of notification of the result and analyze to confirm bioassay result. Continue to monitor. Contact the regional water board and the State Water Board to discuss additional actions, which may include, but are not limited to, targeted and/or non-targeted analytical chemistry monitoring, increased frequency of bioassay monitoring, toxicological studies, engineering removal studies, modification of facility operation, implementation of a source identification program, and monitoring at additional locations.

ATTACHMENT B: MONITORING AND REPORTING PROGRAM
ORDER WQ 2016-0068-DDW
WATER RECLAMATION REQUIREMENTS
FOR RECYCLED WATER USE

This monitoring and reporting program (MRP) describes requirements for monitoring a recycled water system. This MRP is issued pursuant to Water Code section 13267. The Administrator shall not implement any changes to this MRP unless and until a revised MRP is issued by the Regional Water Quality Control Board (Regional Water Board) Executive Officer.

The State Water Resources Control Board (State Water Board) and Regional Water Boards are transitioning to the paperless office system.

During the life of this General Order, the State Water Board or Regional Water Board may require the Administrator to electronically submit reports using the State Water Board's California Integrated Water Quality System (CIWQS) program or an alternative database. Electronic submittal procedures will be provided when directed to begin electronic submittals. Until directed to electronically submit reports, the Administrator shall submit hard copy reports.

In some regions, Administrators will be directed to submit reports (both technical and monitoring reports) to the State Water Board's GeoTracker database over the Internet in portable document format (pdf). In addition, analytical data shall be uploaded to the GeoTracker database under a site-specific global identification number. Information on the GeoTracker database is provided on the Internet at:

<http://www.waterboards.ca.gov/ust/electronic_submittal/index.shtml>

The Administrator has applied for and received coverage for the recycled water system that is subject to the notice of applicability (NOA) of Water Quality Order 2016-0068-DDW. The reports are necessary to ensure that the Administrator complies with the NOA and General Order. Pursuant to California Water Code section 13267, the Administrator shall implement this MRP and shall submit the monitoring reports described herein.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The name of the sampler, sample type (grab or composite), time, date, location, bottle type, and any preservative used for each sample shall be recorded on the sample chain of custody form. The chain of custody form must also contain all custody information including date, time, and to whom samples were relinquished. If composite samples are collected, the basis for sampling (time or flow weighted) shall be approved by Regional Water Board staff.

Field test instruments (such as those used to test pH, dissolved oxygen, and electrical conductivity) may be used provided that they are used by a California Environmental Laboratory Program (ELAP) certified laboratory or:

1. The user is trained in proper use and maintenance of the instruments;
2. The instruments are field calibrated prior to monitoring events at the frequency recommended by the manufacturer;
3. Instruments are serviced by the manufacturer or authorized representative at the recommended frequency; and
4. Field calibration reports are maintained and available for at least three years.

Monitoring requirements listed below may duplicate existing requirements under other orders including WDRs or waivers of WDRs that regulate agricultural discharges from irrigated lands. Duplication of sampling and monitoring activities are not required if the monitoring activity satisfies the requirements of this General Order. Collecting composite samples is acceptable in most cases. The facility may continue using existing sampling collection equipment that is consistent with the applicable facility order. However, due to short sample holding times, bacteriological samples collected to verify disinfection effectiveness must be grab samples. In addition to submitting the results under another order, the results shall be submitted in the reports required by this General Order.

All of the monitoring listed below may not be applicable to all recycled water projects. Consult the NOA or Regional Water Board staff to determine applicable requirements.

RECYCLED WATER MONITORING

If recycled water is used for irrigation of landscape areas[1], priority pollutant monitoring is required at the production facility. The frequency of monitoring corresponds to the flow rate of the recycled water use. Sampling shall be consistent with the following:

Constituent	Treatment System Flow Rate	Sample Frequency	Reporting Frequency
Priority Pollutants	< 1mgd	5 years	The next annual report.
	≥ 1mgd	Annually	Annually

mgd denotes million gallons per day.

1 Landscape areas are defined as parks; greenbelts, playgrounds; school yards; athletic fields; golf courses; cemeteries; residential landscaping; common areas; commercial landscaping (except eating areas); industrial landscaping (except eating areas); freeway, highway, and street landscaping.

DISINFECTION SYSTEM MONITORING

If disinfection is performed, samples shall be collected from downstream of the disinfection system and analyzed by an approved laboratory per Title 22, section 60321(a). Depending upon the level of disinfection and recycled water application to land, monitoring requirements vary. Disinfection monitoring shall be customized to the site-specific conditions from the following:

Constituent/Parameter	Units	Sample Type	Sample Frequency	Reporting Frequency
Total Coliform Bacteria	MPN/100 mL[(a)]	Grab	TBD [(b)]	TBD [(c)]
Turbidity	NTU[(a)]	Grab/Meter	TBD [(b)]	TBD [(c)]

[(a)] MPN/100 mL denotes most probable number per 100 mL sample. NTU denotes nephelometric turbidity unit.
[(b)] TBD (to be determined) shall be specified in the NOA or as required by California Code of Regulations, title 22 section 60321.
(c) TBD (to be determined) shall be specified in the NOA or as required by CCR, title 22, section 60329(c).

POND SYSTEM MONITORING

In some cases, recycled water storage ponds may be used to store recycled water when it is not needed. These monitoring requirements apply only to ponds permitted through this General Order. Ponds covered by an existing order shall continue to be monitored in accordance with that order. Pond(s) containing recycled water shall be monitored for the following:

Parameter	Units	Sample Type	Sample Frequency[(a)]	Reporting Frequency
Freeboard	0.1 feet	Measurement	Quarterly	Annually
Odors	--	Observation	Quarterly	Annually
Berm condition	--	Observation	Quarterly	Annually

[(a)] Or less frequently if approved by the Regional Water Board Executive Officer

USE AREA MONITORING

The Administrator shall monitor use areas(s) at a frequency appropriate to determine compliance with this General Order and the Administrator's recycled water use program requirements. An Administrator may assign monitoring responsibilities to a User as part of the Water Recycling Use Permit program; the Administrator retains responsibility to ensure the data is collected, as well as prepare and submit the annual report.

The following shall be recorded for each user with additional reporting for use areas as appropriate. The frequency of use area inspections shall be based on the complexity and risk of each use area. Use areas may be aggregated to combine acreage for calculation or observation purposes. Use area monitoring shall include the following parameters:

Parameter	Units	Sample Type	Sampling Frequency[a]	Reporting Frequency
Recycled Water User	--	--	--	Annually
Recycled Water Flow	gpd[b]	Meter[c]	Monthly	Annually
Acreage Applied[d]	Acres	Calculated	--	Annually
Application Rate	inches/acre/year	Calculated	--	Annually
Soil Saturation/Ponding	--	Observation	Quarterly	Annually
Nuisance Odors/Vectors	--	Observation	Quarterly	Annually
Discharge Off-Site	--	Observation	Quarterly	Annually
Notification Signs[e]	--	Observation	Quarterly	Annually

[a] Or less frequently if approved by the Regional Water Board Executive Officer.
[b] gpd denotes gallons per day.
[c] Meter requires meter reading, a pump run time meter, or other approved method.
[d] Acreage applied denotes the acreage to which recycled water is applied.
[e] Notification signs shall be consistent with the requirements of California Code of Regulations, title 22, section 60310 (g).

COOLING/INDUSTRIAL/OTHER USES OF RECYCLED WATER

If recycled water is used for industrial, commercial cooling, or air conditioning in which a mist is generated, the cooling system shall comply with California Code of Regulations, title 22, section 60306 (c).

DUAL PLUMBED RECYCLED WATER SYSTEMS

If dual plumbed recycled water systems are proposed, consult with State Water Board for additional reporting, design, and operation requirements. The frequency of testing for cross connection and backflow prevention devices shall be as listed below or more frequently if specified by State Water Board.

Requirement	Frequency	Reporting Frequency
Cross Connection Testing	Four Years[a]	30 days/Annually[b]
Backflow Incident	--	24 hours from discovery
Backflow Prevention Device Testing and Maintenance	Annually[c]	Annually

[a] Testing shall be performed at least every four years, or more frequently at the discretion of the State Water Board Division of Drinking Water.
[b] Cross connection testing shall be reported pursuant to California Code of Regulations, title 22, section 60314. The report shall be submitted to State Water Board within 30 days and included in the annual report to the Regional Water Board.
[c] Backflow prevention device maintenance shall be tested by a qualified person as described in California Code of Regulations, title 17, section 7605.

REPORTING

In reporting monitoring data, the Administrator shall arrange the data in tabular form so that the date, data type (e.g., flow rate, bacteriological, etc.), and reported analytical or visual inspection results are readily discernible. The data shall be summarized to illustrate compliance with this General Order and NOA as applicable. The results of any monitoring done more frequently than required at the locations specified in the MRP shall be reported in the next regularly scheduled monitoring report and shall be included in calculations as appropriate.

During the life of this General Order, the State Water Board or Regional Water Board may require the Administrator to electronically submit reports using the State Water Board's California Integrated Water Quality System (CIWQS) program or an alternative database. Electronic submittal procedures will be provided when directed to begin electronic submittals. Until directed to electronically submit reports, the Administrator shall submit hard copy reports.

A. Annual Report

Annual Reports shall be submitted to the Regional Water Board by **April 1st following the monitoring year**. The Annual Report shall include the following:

1. A summary table of all recycled water Users and use areas. Maps may be included to identify use areas. Newly permitted recycled water Users and use areas shall be identified. When applicable, supplement to the Title 22 Engineering Report and the State Water Board approval letter supporting those additions shall be included.
2. A summary table of all inspections and enforcement activities initiated by the Administrator. Include a discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into compliance with the NOA and/or General Order. Copies of documentation of any enforcement actions taken by the Administrator shall be provided.
3. An evaluation of the performance of the recycled water treatment facility, including discussion of capacity issues, system problems, and a forecast of the flows anticipated in the next year.

4. Tabular and graphical summaries of all monitoring data collected during the year, including priority pollutant monitoring, if required.
5. The name and contact information for the recycled water operator responsible for operation, maintenance, and system monitoring.

A letter transmitting the annual report shall accompany each report. The letter shall summarize the numbers and severity of violations found during the reporting period, and actions taken or planned to correct the violations and prevent future violations. The transmittal letter shall contain the following penalty of perjury statement and shall be signed by the Administrator or the Administrator's authorized agent:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of the those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The Administrator shall implement the above monitoring program.

ATTACHMENT C: STANDARD PROVISIONS AND REPORTING REQUIREMENTS
ORDER WQ 2016-0068-DDW
WATER RECLAMATION REQUIREMENTS
FOR RECYCLED WATER USE

A. GENERAL PROVISIONS

1. Duty to Comply

   a. An Administrator must comply with all of the conditions of this General Order and the MRP. Any General Order or MRP non-compliance constitutes a violation of the Water Code and/or Basin Plan and is subject to enforcement action.

   b. The filing of a request by the Administrator for a modification, revocation and reissuance, termination, a notification of planned changes, or anticipated non-compliance does not stay any General Order or MRP condition.

2. Duty to Mitigate

   The Administrator shall take all reasonable steps to minimize or prevent any discharge in violation of this General Order which has a reasonable likelihood of adversely affecting public health or the environment, including such accelerated or additional monitoring as requested by the State or Regional Water Board to determine the nature and impact of the violation.

3. Property Rights

   This General Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from liabilities under federal, state, or local laws.

4. Duty to Provide Information

   The Administrator shall furnish, within a reasonable time, any information the Regional Water Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the General Order coverage. The Administrator shall also furnish to the Regional Water Board, upon request, copies of records required to be kept by its General Order.

5. Availability

   A copy of this General Order, the NOA, and the MRP shall be maintained at the Administrator facilities and be available at all times to operating personnel.

B. GENERAL REPORTING REQUIREMENTS

1. Signatory Requirements

   a. All reports required by this General Order and other information requested by the Regional Water Board shall be signed by the Administrator principal owner or operator, or by a duly authorized representative of that person.

Duly authorized representative is one whose:

1) Authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as general manager in a partnership, manager, operator, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position), and

2) Written authorization is submitted to the Regional Water Board. If an authorization becomes no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements above must be submitted to the Regional Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative.

b. Certification

All reports signed by a duly authorized representative under Provision C.1 shall contain the following certification:

"I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

2. Should the responsible reporting party discover that it failed to submit any relevant facts or that it submitted incorrect information in any report, it shall promptly submit the missing or correct information. All violations of any requirements in this General Order, including Uniform Statewide Recycling Criteria requirements shall be submitted in the annual self-monitoring reports.

3. False Reporting

Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this General Order, including monitoring reports or reports of compliance or non-compliance shall be subject to enforcement procedures as identified in Section C of these Provisions.

C. ENFORCEMENT

1. The provision contained in this enforcement section shall not act as a limitation on the statutory or regulatory authority of the State and Regional Water Board.
2. Any violation of this General Order constitutes violation of the Water Code and regulations adopted thereunder, and are the basis for enforcement action, General Order termination, General Order revocation and reissuance, denial of an application for General Order reissuance, or a combination thereof.
3. The State and Regional Water Board may impose administrative civil liability, may refer a discharger to the State Attorney General to seek civil monetary penalties, may seek injunctive relief or take other appropriate enforcement action as provided in the Water Code for violation of this General Order.

Table 2: Required Sampling/Monitoring Frequency for WWTPs

Constituent or Facility	Sample or Monitoring Frequency	Reporting Frequency
Priority Pollutants	Every 5 years	Ensuing Annual Report
Total Coliform Bacteria	TBD by RWQCB determined but anticipate weekly sampling	Monthly and summarized in annual report
Turbidity	TBD by RWQCB but anticipate continuous monitoring	Monthly and summarized in annual report
Freeboard	TBD by RWQCB but anticipate weekly	Quarterly and summarized in annual report
Odors	TBD by RWQCB but anticipate weekly	Quarterly and summarized in annual report
Berm Condition	TBD by RWQCB but anticipate weekly	Quarterly and summarized in annual report
Spray Fields	TBD by RWQCB but anticipate weekly	Quarterly and summarized in annual report

SEWER CAPACITY EVALUATION REPORT

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woodardcurran.com

0012108.00

City of Pleasanton

November 2024

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1. INTRODUCTION

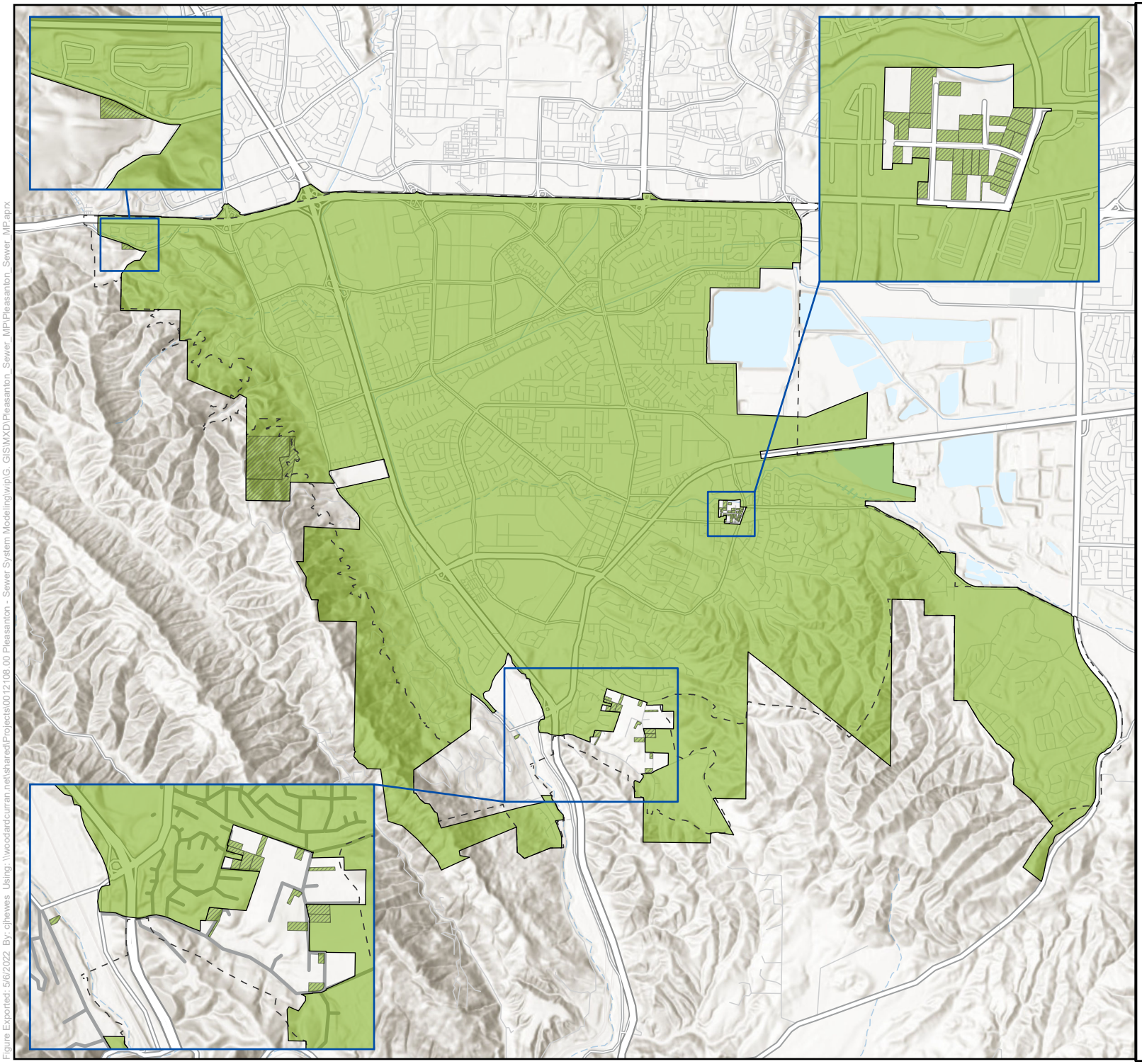
This Capacity Evaluation Report (2024 Capacity Evaluation) summarizes the development of the hydraulic model for the City of Pleasanton (City) sanitary sewer system and describes the capacity improvement projects identified to be included in the City's upcoming Capital Improvement Program. This report describes how the model is configured, discusses the development of the model network and the model loads, and describes the flow monitoring program and model calibration. The calibrated hydraulic model was used to analyze the capacity of the system, identify areas of capacity deficiencies, and develop recommendations for capacity improvements.

The City is located in southern Alameda County and covers approximately 25 square miles. The City's sanitary sewer system consists of approximately 258 miles of pipe, ranging from 4 to 60 inches in diameter, and 12 pumping stations. The majority of the system discharges to the Dublin San Ramon Services District (DSRSD) Regional Wastewater Treatment Facility (WWTF) located on Johnson Drive. The DSRSD plant has a design capacity of 8.5 million gallons per day (mgd) of dry weather flow allocated to the City of Pleasanton. The Ruby Hills development in the far southeastern part of the city discharges to the Livermore Water Reclamation Plant in accordance with the Interjurisdictional Agreement between the two cities. The City's service area is shown in Figure 1-1, and serves as the extent of this study.

Four City trunk sewer pipelines are tributary to the DSRSD WWTP: the Highland Oaks trunk sewer, which services the northwestern portion of the City; the East Amador Trunk Sewer (EATS, also known as the Cross-Town Interceptor), which services the northeastern and northern portions of the City; Lift Station 6 (LS-6) force main, which conveys flow from the central and eastern portions of the City; and the Lift Station 8 (LS-8) force main, which conveys flow from the southern portion of the City.

This 2024 Capacity Evaluation follows the 2007 Wastewater Master Plan[1] (2007 Master Plan). The 2007 Master Plan identified several wet weather capacity deficiencies, but overall noted that the system showed relatively few infiltration/inflow (I/I) problems. This report revisits several of the design assumptions made in the 2007 Master Plan, discusses updates to the land use and associated dry weather flows, and describes the development of a new all-pipes model in Autodesk's InfoWorks ICM™ sewer modeling software, calibrated to new flow monitoring data.

[1] Carollo, *Wastewater System Master Plan*, August 2007



City of Pleasanton Sewer Collection System Hydraulic Model Development

Figure 1-1: Existing Sewer Service Area

Legend

- City Limit
- Urban Growth Boundary
- Existing Sewer Service Area
- Out-of-Area Service Agreement

0 0.25 0.5 1 Miles

N

Woodard & Curran

Project #: 0012108.00
Map Created: October 2024

Figure Exported: 5/6/2022 By: cjhewes Using: \\woodardcurran.net\shared\Projects\0012108.00 Pleasanton - Sewer System Modeling\wip\G_GIS\MXD\Pleasanton_Sewer_MP\Pleasanton_Sewer_MP.aprx

2. HYDRAULIC MODEL OVERVIEW

This chapter provides an overview of the hydraulic model and modeling terminology and the model development process, further detailing the modeled sewer network and facilities. Subsequent chapters describe the flow monitoring program conducted for this study, the basis for estimating existing and future wastewater flows, and calibration of the model.

The modeling software used for the 2024 Capacity Evaluation model update was InfoWorks ICM™ (Version 2023.1), a fully dynamic hydraulic model that has been used for many other collection systems in the Bay Area, including Union Sanitary District, Central Contra Costa Sanitary District, and the Cities of San Jose, Sunnyvale, and Santa Clara. W&C used its own InfoWorks licenses for this work.

2.1 Modeling Terminology

Key modeling terms are defined below.

- **Network** refers to the representation of the physical facilities being modeled. Modeled network components include pipes, manholes, pump stations, etc.
- **Nodes** are primarily manholes, but also include pump station wet wells and outfalls (discharge points from the modeled system). Key data associated with nodes include manhole ground elevations and pump station wet well elevations and cross-sectional areas.
- **Pipes** or **conduits** are connections between nodes and include both gravity sewers and force mains. Key data associated with pipes are upstream and downstream node IDs, pipe length, diameter, roughness and headloss factors, and upstream and downstream invert elevations.
- **Pumps** are modeled individually, connecting pump station wet wells with the upstream node of associated force mains. Data associated with pumps include type (e.g., fixed or variable speed), on and off levels, pump capacities, and pump discharge curves.
- **Subcatchments** are areas that contribute flow to the modeled sewer network. Data associated with subcatchments include sanitary flow (computed based on population, water use, or other available data), type of diurnal sanitary flow profile (which is a function of land use), infiltration/inflow (I/I) parameters, and the node at which the flow from the subcatchment enters the modeled system.
- **Model loads** are the flows entering the modeled sewer system from each subcatchment. Model loads include residential and commercial sanitary or base wastewater flow (BWF), groundwater infiltration (GWI), and rainfall-dependent I/I (RDI/I). As a sum, they represent the total wastewater flow applied to the model.
- **Models** are the combination of a modeled network, its associated subcatchments and loads, and other data (e.g., rainfall, diurnal profiles, inflows from other areas, etc.) that comprise a specific model scenario.
- **Throttle Surcharges** happen in pipes during throttle conditions, or when peak flows are greater than full pipe capacity.
- **Backup Surcharges** happen when a lift station backs up and causes surcharge in upstream sewer pipes.

2.2 Hydraulic Model Network Development

The model network includes the pipes, manholes, and other physical facilities that comprise the modeled sewer system. This chapter describes the modeled system, including how the sewer facilities are represented in the model, the data attributes that describe the facilities, and the processes for validating that data.

2.2.1 Modeled System

The model network for the City developed for this study includes all pipes that are owned by the City. In total, the network includes about 258 miles of pipelines, 5.7 miles of which are force mains. The modeled network is summarized in **Table 2-1** and shown in **Figure 2-1**.

The City's sewer collection system receives flow from approximately 25,000 parcels across Pleasanton, including from the private Castlewood community. The Castlewood portion of the collection system is owned and operated by the private property owner's association. Flow from Castlewood is collected at LS-10 and pumped to Pleasanton through a 6-inch diameter force main that discharges to the gravity sewer on Marlyn Murphy Kane Trail and Laguna Creek Lane. Flow from the Castlewood area is ultimately pumped to the DSRSD treatment plant via LS-8

The flow from the Ruby Hills neighborhood of Pleasanton, is not conveyed to DSRSD but flows north and discharges to the Livermore Water Reclamation Plant. The City of Pleasanton owns and maintains the gravity sewer until it reaches Isabel Avenue, from where the flow is conveyed through sewers owned and operated by the City of Livermore to the Livermore Water Reclamation Plant.

Table 2-1: Modeled System Summary

Facility	Quantity	Size/Capacity
Gravity Sewer	1,335,370 ft. (252.9 miles)	6 to 60 inch
Force Main	29,945 ft. (5.7 miles)	6 to 18 inch
Pump Stations (see **Table 2-2**)	12	0.69 to 7.6 mgd

Figure 2-1: Modeled Network

Pleasanton Capacity Evaluation Report

East Amador Trunk Sewer (EATS)

EALS Pump Station

Highland Oaks Trunk Sewer

Ruby Hills neighborhood flows North to the Livermore Water Reclamation Center.

Ruby Hills Neighborhood

Castlewood Community

Legend

Modeled Gravity Sewers
- >15in
- ≤15in

Non-City Maintained Sewer (Not Modeled)
- DSRSD
- LAVWMA
- Other Private Sewers
- City Force Main
- Private Force Main

Lift Stations
- City Lift Station
- DSRSD
- Private Lift Station

0 0.25 0.5 1 Miles

Map Created: May 2024

2.2.2 Model Network Construction and Validation

The primary data used to create the model network was provided by the City as GIS shapefiles of the sewer system pipes, manholes, and other structures. Asset properties such as pipe diameter, length, invert elevations, and material were defined within the City's GIS.

For areas with missing data or in areas where more information was needed to construct the model, invert elevations were interpolated between known inverts, or additional PDF maps and as-built drawings were reviewed to find missing or verify suspect data.

The City's entire sewer system was imported to InfoWorks ICM. A fully connected all-pipe network was created which allowed modeled wastewater flows for individual parcels to load to their respective sewer. Additional discussion of load development and allocation is provided in **Chapter 4**.

The model construction and validation process included the following:

- The model network was checked for connectivity, i.e., verifying that correct upstream/ downstream manholes were identified for each pipe and that there were no missing links in the network.
- Manhole and pipeline network data, including rim and invert elevations and pipeline sizes, were refined from the City's GIS based on the following data sources:
    - Where invert elevation data were missing or inconsistent with nearby elevations, and not determined through as-built information, interpolated values between known values were used as appropriate. Interpolation was used to infer inverts for approximately 80 manholes out of 6,600 manholes included in the model, and generally limited to no more than 2 pipe segments in a row. Based on discussion with City staff, this level of inference was unlikely to significantly impact the model's accuracy for predicting significant surcharge.
    - Elevation data in the PDF maps and in the as-builts were adjusted as needed to the NAVD 88 datum. The adjustment used to convert from NGVD 29 to NAVD 88 was +2.49 feet.
    - A ground model was built using 1-meter digital elevation model (DEM) tiles downloaded from the USGS National Map[1] and was used to where rim elevation data was not included in the City's GIS data.
- Based on the data provided by the sources above, profiles were plotted for each series of pipe segments in the modeled network to visually check for missing or suspect data. Where data indicated a discrepancy (e.g., reverse slope), record drawings or other information was requested from the City, and an approach to resolve the discrepancy was identified.
- The sources of model data (e.g., PDF map, as-built/record drawings, etc.) were documented using "flags" in the model database.
- Each subcatchment represents a single assessor parcel in the City. Each subcatchment was first assigned to a pipe in the all-pipe network based on its proximity to the closest sewer main. The subcatchment load points were refined based on review of the GIS data and as part of the calibration process (discussed further in **Chapter 5**).

[1] Elevation data were downloaded from the USGS 3D Elevation Program (3DEP), available here: https://www.sciencebase.gov/catalog/item/5eaa4f2a82cefae35a220e0f (last updated 2013).

- All gravity pipelines were modeled assuming a Manning's n of 0.013 (except as needed during calibration; see **Chapter 5** for more details).

2.2.3 Pump Stations

All of the City's twelve active sewer system pump (lift) stations were included in the all-pipe network model (the East Amador Lift Station (EALS) which is owned by DSRSD was also included in the model). Pump data summary sheets provided by the City, available record drawings for the lift stations, and data from the 2007 Master Plan were used to configure the pump stations in the model. Pump on/off levels (converted to elevations) were based on the on/off wet well levels indicated in the pump station summary sheets and as-builts, or assumed values based on the previous model. Pump station firm capacity (with largest pump out of service) and total capacity (with all pumps active) were estimated for each pump station based on a comparison of the pump and system curves or the values listed in the 2007 Master Plan. A summary of the pump stations included in the model is presented in **Table 2-2**. As indicated in Table 2-2, LS-6 and LS-8 were evaluated in more detail due to backup surcharge during calibration. For a detailed discussion of these lift stations, see **Chapter 5.2.1**. Pump and system curves for LS-6, LS-7, and LS-8 are included in **Appendix A.**

Table 2-2: Modeled Lift Stations

Pump Station	Description	Force Main Diameter (inches)	Force Main Length (feet)	Firm Capacity (mgd)[a]	Total Capacity (mgd)[b]
LS-2	Oak Tree Farms	8, 14	214, 277	0.19	0.38
LS-4	Valley Business Park	10	354	0.55	1.1
LS-5	San Francisco	10	775	2.1	3.2
LS-6	Arroyo Mocho	20	2,700	5.2[c]	5.5[c]
LS-7	-	18	910	7.5[d]	9.2[d]
LS-8	Bernal Business Park	18	10,000	3.4[e]	4.4[e]
LS-10	Castlewood	6	855	0.35	0.69
LS-12	Sunol	6	1,900	0.49[f]	0.55[f]
LS-14	Happy Valley	4	1,145	0.22[f]	0.40[f]
LS-15	-	6	840	NA	NA
EALS	East Amador List			3.6	7.2

a. Firm capacity is defined as the capacity with the largest pump out of service. The values shown reflect the listed capacity of the lift stations based on the 2007 Master Plan, unless indicated otherwise.
b. Total capacity is defined as the capacity with all pumps in service. The values shown reflect the listed capacity of the lift stations based on the 2007 Master Plan, unless indicated otherwise.
c. Firm and total capacity listed for LS-6 are based on capacity prior to surcharging. LS-6's rated capacity based on pump curves is 6.6 mgd. During calibration, pump curves were derated by 15 percent based on observed flows and wet well level (as discussed further in Chapter 5). The City has recently replaced pump impellers of all S-6 pumps and will re-evaluate pump performance at a later date.
d. LS-7 capacity was estimated based on pump curves dated 11/11/2008. However, recent pump capacity test results were not available.
e. LS-8 capacity based on pump station flow data recorded during the 12/31/2022 storm event. Capacity indicated in the 2007 Master Plan was 4.0 and 6.1 mgd (firm and total capacity, respectively).
f. LS-12 capacity was estimated based on pump curves dated 10/3/2000. LS-14 capacity was estimated based on pump curves dated 11/4/2002.

3. FLOW MONITORING PROGRAM

To support the development of the hydraulic model, a temporary flow monitoring program was conducted as part of this study. The purpose of the flow monitoring program was to obtain data to quantify flows and characterize I/I in the system, and to calibrate the hydraulic model for both dry weather and wet weather conditions.

3.1 Flow Monitoring and Rain Gauge Sites

Prior to this Capacity Evaluation, flow monitoring was performed as part of the 2007 Master Plan and the 2012 Sanitary Sewer Flow Monitoring and Inflow/Infiltration Study. For the 2007 Master Plan, flow monitoring was conducted at 11 sites on sewers across the City during the 2003/2004 wet weather season, and five recording rain gauge were installed. For the 2012 Sanitary Sewer Flow Monitoring and Inflow/Infiltration Study, flow monitoring was conducted at 7 sites on sewers in the northwest part of the City (known as Flow Meter Basin 3 and 3A) during the 2011/2012 wet weather season, and one recording rain gauge was installed. This Capacity Evaluation flow monitoring program comprised 14 temporary gravity flow meters and 7 rain gauges (4 installed for the program and 3 existing City gauges) placed throughout the collection system for a period of two months from December 2022 through February 2023. V&A Consulting Engineers (V&A), under sub-contract to Woodard & Curran, installed the flow meters and rain gauges and conducted the monitoring.

Flow meter sites were selected to supplement and confirm the monitoring that was completed in 2003/2004 and 2011/2012. For example, where capacity issues were previously observed, additional meters were installed upstream within that tributary meter basin to further isolate flow and determine possible I/I locations. The location of the flow monitoring sites and rain gauges are shown in **Figure 3-1.** Note that some meters were located downstream of other meters. In those cases, the meter tributary areas are "incremental" (areas between the flow meter and tributary basins of the upstream flow meters). **Table 3-2** lists the flow meter locations and pipe diameters, and notes which meters are incremental (have upstream meters).

In addition to the temporary flow meters and rain gauges, the City also provided pump station flow data for the East Amador Lift Station, the Highland Oaks Siphon, LS-6, LS-7, and LS-8 as well as flow data into the DSRSD WWTP for the 2022/2023 flow monitoring period.

A schematic showing the temporary flow meters and pump stations is presented as **Figure 3-2**. Plots of the 2022/2023 flow monitoring data, including flow, velocity, and level, are provided as **Appendix C**.

There were several significant rainfall events during the 2022/2023 flow monitoring period, including events that exceeded the intensity of the 10-year design storm used in the 2007 Master Plan (see **Table 3-1** and **Chapter 4** for more detail on rainfall).

Table 3-1: Rainfall Summary[a]

Duration (hr)	12/26/2022 - 1/15/2023	
	Max Depth (in.)	Max Return Period[a]
1 hr	0.74	> 5 yr
6 hr	2.12	> 10 yr
12 hr	4.13	> 50 yr
24 hr	4.88	>25 yr
2-day	6.26	>25 yr
3-day	6.71	>25 yr
7-day	8.99	>25 yr
10-day	10.64	>25 yr
20-day	17.84	>200 yr

a. Maximum depth (in) and return period for Central Pleasanton from NOAA Atlas 14

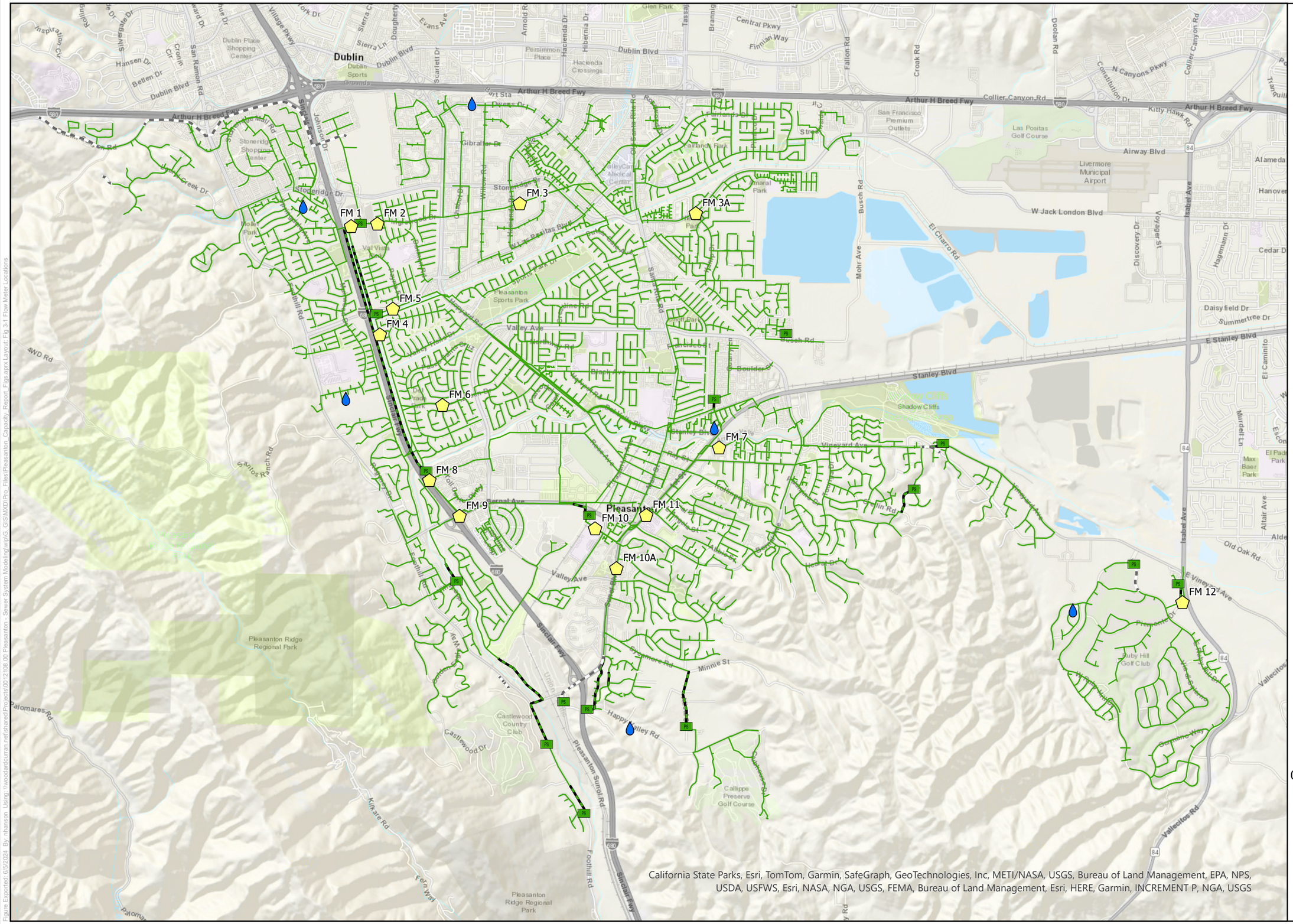
Table 3-2: Flow Meter Locations

Flow Meter ID (FM ID)	Upstream FM ID(s)	Manhole ID[a]	Diameter (in)[b]	Location
FM01		40501433	24	7399 Johnson Dr
FM02	FM3, 3A	40501402	33	6852 Inglewood Ct
FM03	FM3A	40501094	27	4225 Hacienda Dr
FM03A		40501373	10	3869 Kamp Dr
FM04	FM6, 7, 9	40502342	27	3986 Petrified Forest Ct
FM05	FM7	40502097	30	6900 W Las Positas Blvd
FM06	FM7	40502824	18	6203 Hansen Dr
FM07		40503318	15	3955 Vineyard Ave
FM08	FM10, 10A, 11	40503680	27	6880 Koll Center Pkwy
FM09		40503986	18	7699 Bernal Ave
FM10	FM10A, 11	40504085	24	5001 Case Ave
FM10A		40504357	10	5420 Sunol Blvd
FM11		40503892	12	100 Abbie St
FM12		40504629	12	801 Piemonte Dr

a. Flow meters were placed in the downstream end of the influent pipe to the manhole.
b. GIS pipe diameter. Actual diameter as measured by V&A may be slightly different.

Figure 3-1: Flow Meter Locations

Pleasanton Capacity Evaluation Report



California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, Esri, NASA, NGA, USGS, FEMA, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, NGA, USGS

Legend

- ⬠ Flow Meter Locations
- 💧 Rain Gauge Locations
- — Modeled Gravity Mains
- - - Private Force Main
- ━ City Force Main
- 🟩 Sewer Lift Station

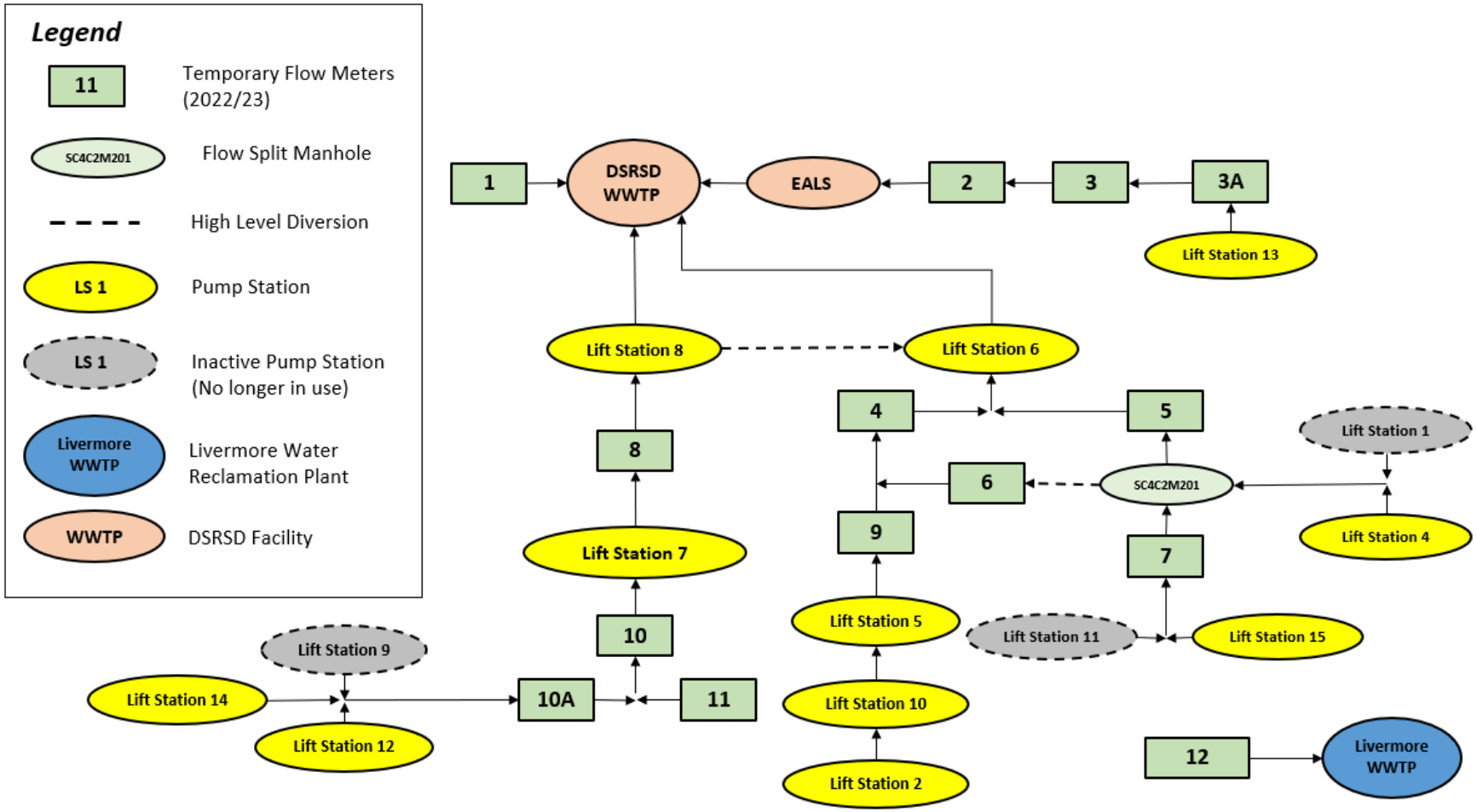
Woodard & Curran

THE CITY OF PLEASANTON

Map Created: May 2024

Figure Exported: 6/5/2024 By: nhanson Using: \\woodardcurran.net\shared\Projects\0012108.00 Pleasanton - Sewer System Modeling\wip\G GIS\MXD\Pro Files\Pleasanton_Capacity_Report_Figs.aprx Layout: Fig 3-1 Flow Meter Locations

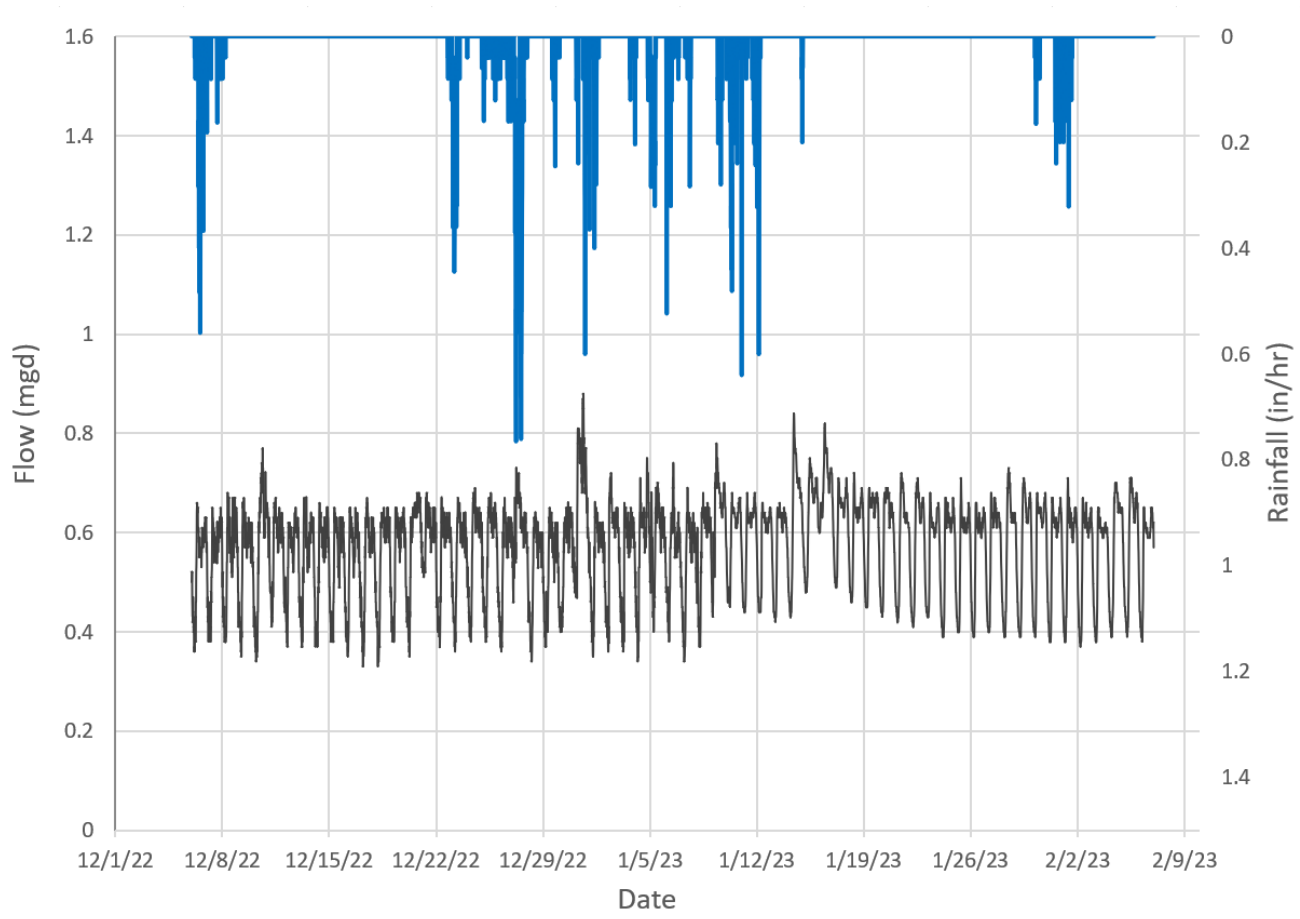
Figure 3-2: Flow Meter & Pump Station Schematic



3.2 Flow Monitoring Data

During the flow monitoring program, V&A routinely inspected the flow meters, and temporary flow meter data was uploaded on a continuous basis through the Claros™ online portal. In addition to V&A's internal data review and quality control procedures, Woodard & Curran staff periodically reviewed the preliminary flow meter data over the course of the monitoring program to inspect for changes in flow indicating potential problems with the flow meter (e.g., debris buildup on the sensor), change in system operation or potential customer discharges, or response to wet weather events. V&A provided "final" (quality controlled and adjusted data) after the conclusion of the program. **Figure 3-3** shows typical plots of measured flow and rainfall for one flow meter for the flow monitoring period. Several significant storms occurred during the monitoring period, particularly from late December through mid-January.

Figure 3-3: Plot of Typical Flow Data For Flow Monitoring Period



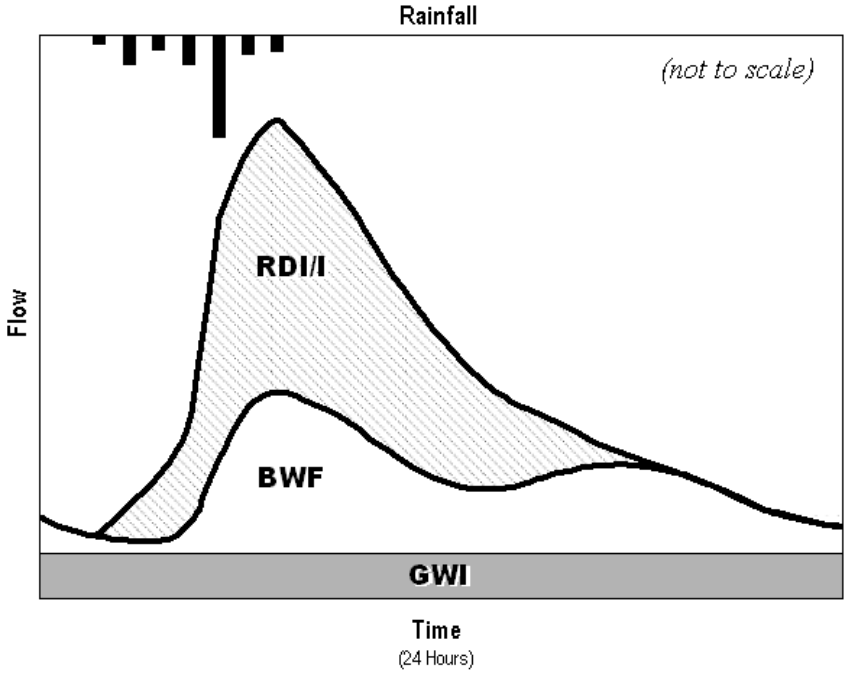
4. FLOW ESTIMATING METHODOLOGY

This chapter describes how wastewater flows were incorporated in the model. This chapter includes information on existing wastewater flows (base wastewater flows), future wastewater flows which account for proposed developments across the City, diurnal patterns for wastewater for residential and non-residential use, and groundwater infiltration.

4.1 Wastewater Flow Components

Wastewater flows include three components: base wastewater flow (BWF), groundwater infiltration (GWI), and rainfall-dependent infiltration/inflow (RDI/I), as illustrated conceptually in **Figure 4-1**.

Figure 4-1: Wastewater Flow Components



BWF represents the sanitary and process flow contributions from residential, commercial, institutional, and industrial users of the system. BWF varies throughout the day, but typically follows predictable diurnal patterns depending on the type of land use. (Note: in InfoWorks terminology, BWF is referred to as "foul flow".)

GWI is groundwater that infiltrates into defects in sewer pipes and manholes, particularly in winter and springtime in low-lying areas. GWI is typically seasonal in nature and remains relatively constant during specific periods of the year. However, rainfall typically has long-term impacts on GWI rates, as evidenced by measurable increases in GWI after prolonged periods of rainfall. (Note: in InfoWorks terminology, GWI is referred to as "baseflow".)

RDI/I is storm water inflow and infiltration that enter the system in direct response to rainfall events, either through direct connections such as holes in manhole covers or illegally connected roof leaders or area drains, or, more commonly, through defects in sewer pipes, manholes, and service laterals. RDI/I typically result in short term peak flows that recede relatively quickly after the rainfall ends. The magnitude of RDI/I flows are related to the intensity and duration of the rainfall, the relative soil moisture at the time of the rainfall event, and the condition of the sewers. (Note: in InfoWorks terminology, RDI/I is referred to as "runoff").

4.2 Base Wastewater Flow

Existing residential and non-residential base wastewater flows for the entire City were estimated using information compiled at the parcel level (approximately 25,000 parcels). The total residential and non-residential BWF for each model subcatchment were calculated by summing the BWF for each corresponding parcel.

Existing BWF Loads

Existing BWF was determined based on individual parcel water billing data provided by the City. Metered water use during the winter months most closely approximates wastewater generation, since outdoor water use is at a minimum. Therefore, meter readings averaged over winter months (January, February, March, April) from 2017 through 2021 (with 2020 being omitted due to its assumed irregular water usage due to COVID19 stay-at-home orders) were used as the basis for estimating residential and non-residential BWF.

In some cases, the model loads developed for the Master Plan were updated during dry weather calibration to better match observed flows. Slight differences between current system flows and the 2017-2021 consumption could be attributed to a few factors, such as the COVID-19 pandemic, water conservation, and conversion to recycled water for some industrial users. One of those adjustments included applying a cap of 300 gallons per day (gpd) to single-family residential accounts within the system to remove potential outliers with significantly higher water use, which could reflect irrigation during the winter months. This cap was used most extensively for the Ruby Hills neighborhood, which seemed to have significantly higher water usage even during the winter months. Return factors (typically 80 or 90 percent) were also applied to other residential and non-residential accounts in select parcels, based on the observed flow monitoring data. The wastewater return factor is defined as the proportion of water used that is returned to the wastewater collection system.

All water billing records were geocoded according to parcel assessor parcel number (APN) or to address where parcel APN did not match between the water meter shapefile and the water billing data. The geocoded consumption data was assigned a customer type (commercial or residential) based on the Use Code in the water billing data.

Future BWF Loads

Future BWF was estimated based on a list of 253 development projects that was compiled by Woodard & Curran by combining data from the 2020 Tri-Valley Demand Study[1], data from the City's Housing Element developed by the City's Community Development Department (CDD), and several East Pleasanton Specific Plan (EPSP) projects located near or outside the City's existing urban growth boundary . This list was updated again with the latest Housing Element developed by the CDD in 2022. These are planned projects that will likely be constructed in the near-term (within approximately 10 years). Flows were calculated based on the associated land use or zoning description that was provided by the City and applied flow factors summarized in **Table 4-1**. To estimate future flows associated with residentially zoned parcels, the number of units was multiplied by a flow factor. The flow factor for single family residential parcels (160 gpd/unit) was estimated based on the water billing data (i.e., average consumption of a single-family dwelling). Since unit count data for multi-family parcels was not available in the water billing data, a flow factor of approximately 80 percent of single family water usage was assumed for multifamily dwelling units. To estimate future flows associated with non-residential or commercial development for mixed use parcels, the square footage of the parcel was multiplied by an assumed floor-area-ratio (FAR) based on land use category and then multiplied by a typical flow factor of 0.1 gallons per day (gpd) per square foot.

Table 4-1: Unit Base Wastewater Flow Factors For Future Development

Development Type	Unit	BWF Factor (gpd/unit)
Single Family Residential (SFR)[a]	Dwelling Units	160
Multi-Family Residential (MFR)[b]	Dwelling Units	130
Accessory Dwelling Unit (ADU)[c]	Dwelling Units	130
Non-Residential (NR)	Square feet[d]	0.1
EPSP Non-Residential (NR)[e]	Square feet	0.05

a. Based on average billing data for single family water usage between 2017 and 2021 (excluding 2020).
b. Typical factor of 80% of single-family water usage.
c. ADU's assumed to have flow similar to multifamily units. However, potential future ADUs have not been included in future loading scenarios.
d. Square footage assumptions of future development matches the criteria outlined in the 2020 Tri-Valley Demand Study.
e. A special non-residential unit flow factor was used in the East Pleasanton Specific Plan (EPSP) plan area to match the assumed flows in the Water Master Plan for this area.

For developed parcels planned for redevelopment, it was assumed that the future BWF would replace the existing BWF, unless otherwise noted on the future development plans. For developed parcels that are not planned for redevelopment, the current flow based on water billing data was assumed to characterize their BWF in the future. Future flow assumptions broken out by residential versus non-residential and type of project are shown in **Table 4-2**.

1. Woodard & Curran, *2020 Tri-Valley Demand Study Municipal and Industrial Demand Study*, 2021

Table 4-2: Future Base Wastewater Flow Assumptions

Type of Development	Average Base Wastewater Flow		
	Existing (mgd)	Future (mgd)	Total BWF (mgd)
Residential	**4.03**	**0.76**	**4.79**
Single Family (including Castlewood)	3.11	0.18	3.29
Multifamily	0.92	0.58	1.50
Non-Residential	**1.30**	**0.34**	**1.63**
Total	**5.32**	**1.10**	**6.42**

The list of specific future developments within Pleasanton, including a map, locations, land uses, assumptions, and estimated flows, is provided as **Appendix D**.

BWF Diurnal Patterns

BWF varies throughout the day in a typical way, generally peaking early in the morning in most predominantly residential areas. Typical hourly peaks from residential areas tend to be about twice the average flow. Higher peaks can occur on atypical days of the year (e.g., on major holidays such as Thanksgiving or at halftime on Super Bowl Sunday). For Pleasanton, typical diurnal profiles were developed for residential and commercial/industrial (non-residential) wastewater flow, for both weekend and weekday conditions. The profiles are applied to the subcatchment BWF in the model. The residential profiles were developed based on monitored flows for primarily residential meter areas, and the non-residential profile is based on typical non-residential flow profiles for similar areas. The diurnal profiles used in the model are shown in **Figure 4-2** and **Figure 4-3**.

Figure 4-2: Residential Diurnal Profiles

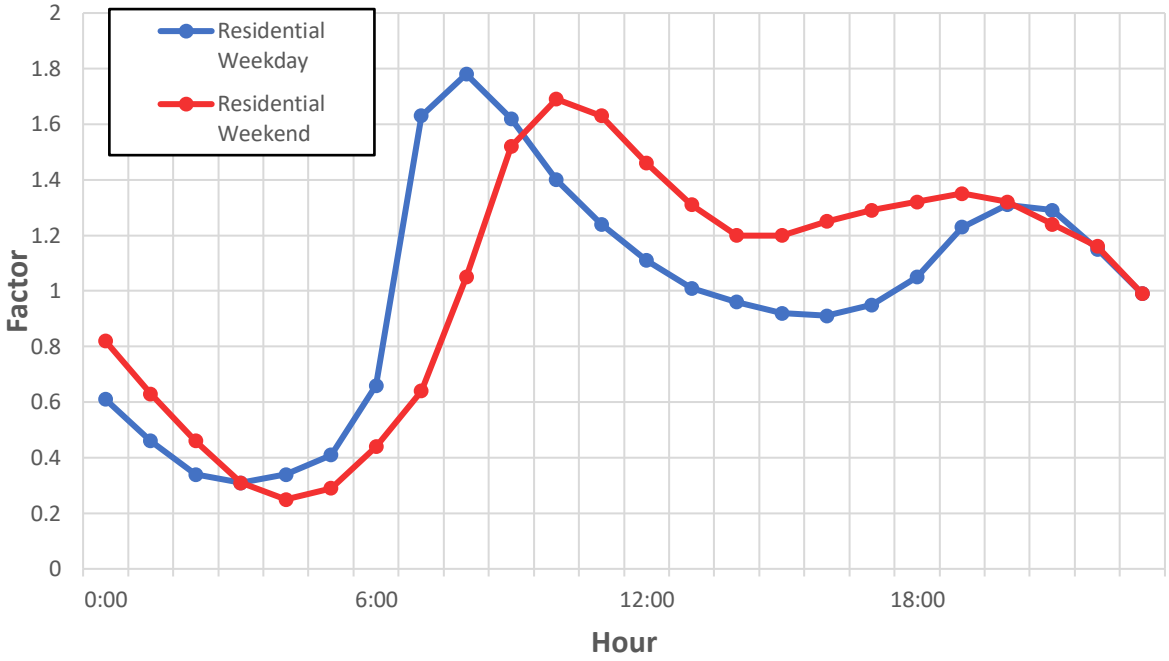
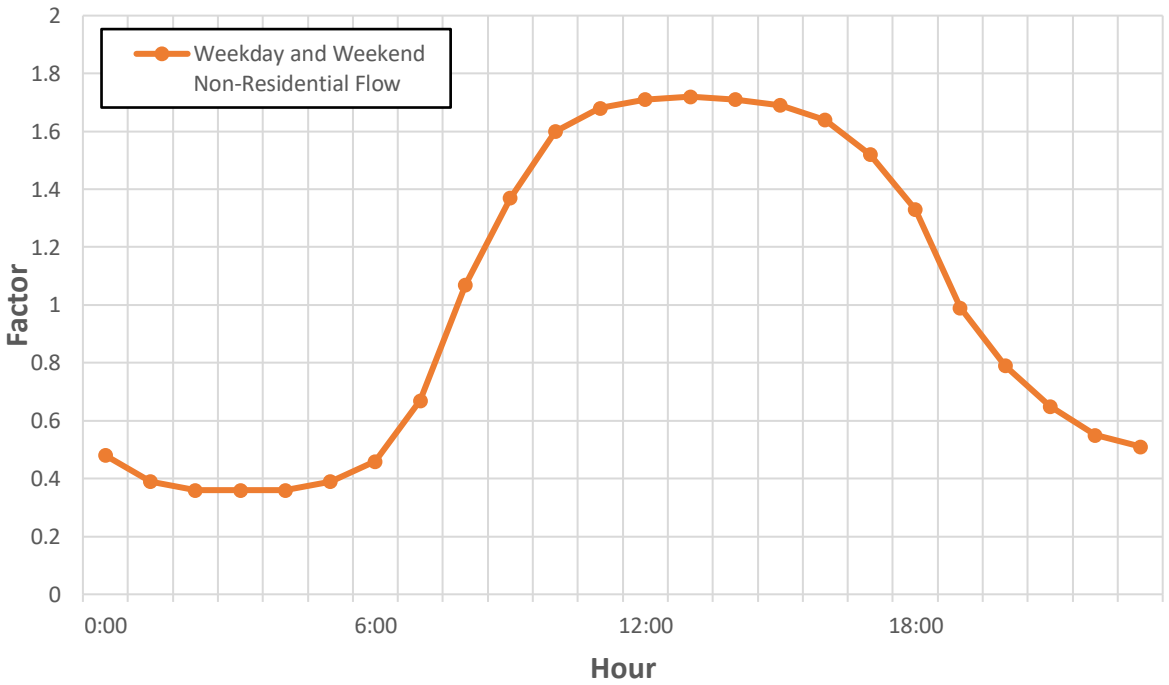


Figure 4-3: Weekday and Weekend Non-Residential Diurnal Profiles



4.3 Groundwater Infiltration

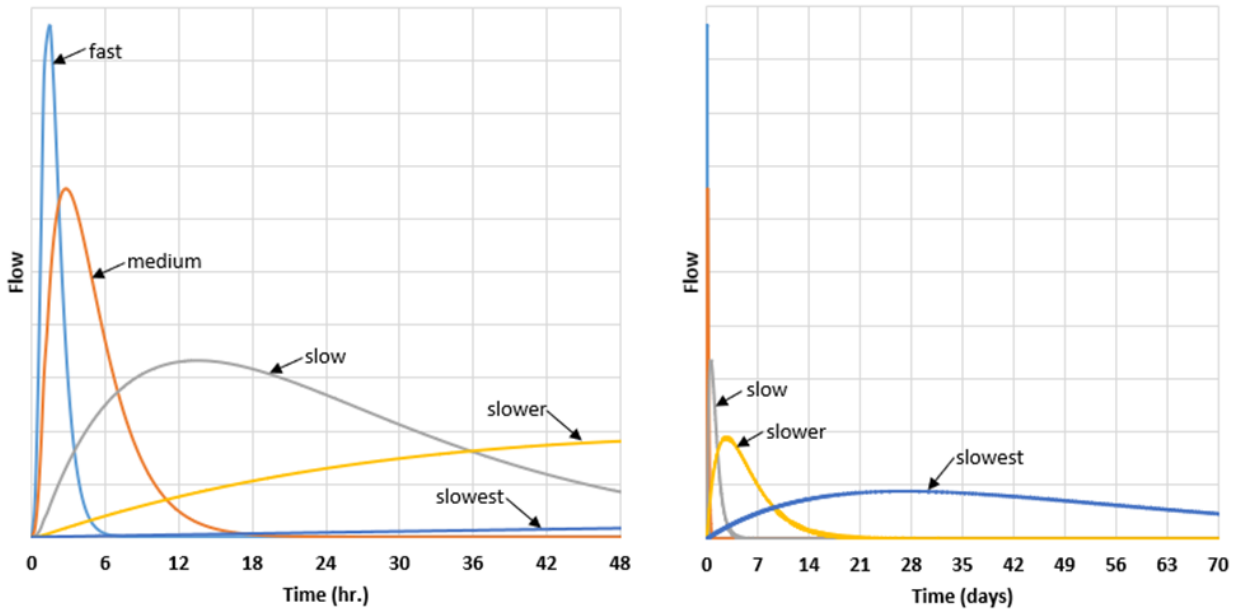
GWI represents a seasonal increase in wastewater flows due to infiltration into the sewers, typically in low-lying areas or areas close to creeks or other water bodies. GWI is applied in the model as a constant flow in addition to the BWF. The amount of GWI in any particular area of the sewer system is determined during model calibration by comparing the modeled flows to the actual observed dry weather (non-rainfall period) flows at points in the system where flow data are available (e.g., at flow meter sites). Where modeled BWF is less than monitored dry weather flow by a relatively constant value throughout the day, the difference is assumed to represent GWI. The GWI determined at the monitoring location is then distributed to the upstream meter tributary area on a weighted per-contributing area basis. For most parcels, the contributing area was set equal to the total parcel area. However, contributing areas for non-vacant single family residential parcels were capped at a maximum of 1 acre, and contributing areas for all other non-vacant parcels were capped at a maximum of 5 acres. Note that because GWI is seasonal in nature, the modeled GWI is intended to represent a typical GWI rate during the wet weather season (wintertime) rather than a dry season (summertime) GWI.

4.4 Rainfall-Dependent Infiltration and Inflow

RDI/I results from rainfall events that produce infiltration and inflow of storm water runoff into the sanitary sewer system. RDI/I can be quantified as the difference between the total flow during and immediately following a storm event and the non-rainfall "base flow" (BWF plus GWI) that is estimated to have occurred during the storm period. RDI/I varies depending on many factors including the magnitude and intensity of the storm event, area topography, type of soil and the degree of soil saturation (due to antecedent rainfall) prior to the storm event, and the condition of the sewers, manholes, and service laterals. RDI/I is usually expressed as a volume or a percentage of the rainfall volume (termed the "R value") entering the sewer system from subcatchment contributing areas for each of several flow components representing different response patterns to rainfall events (e.g., fast, medium, slow).

For this modeling effort, five RDI/I response components were used, with each component identified by a percentage of the total RDI/I volume and other parameters that reflect the timing of the flow response, as illustrated in **Figure 4-4**. The "fast" component of the hydrograph has the largest impact on the magnitude of the peak wet weather flow response, while the slower components can contribute significantly to the total volume of the RDI/I response. The slowest response component can extend out many days or weeks after the rainfall (alternately, this component could be represented as an increase in GWI). Summing all of the component hydrographs for the duration of the rainfall events results in the total RDI/I hydrograph for that area. R values and hydrograph parameters are determined through the process of wet weather model calibration, discussed in **Chapter 5.2** of this report, in which actual observed rainfall events are simulated in the hydraulic model, and the resulting model hydrographs are compared to the measured flows at the flow meter locations. The RDI/I parameters are adjusted as needed to achieve the best match of modeled to monitored flows. The same calibrated parameters are generally applied to all subcatchments within each meter area. Once calibrated, the model RDI/I parameters can be applied to a design storm to simulate wet weather flows for a design event.

Figure 4-4: RDI/I Hydrograph Components



5. MODEL CALIBRATION

This section discusses the results of model calibration. Model calibration is the process of comparing model-simulated flows to monitored (observed) flows and adjusting model parameters until a reasonably good match is achieved. During calibration, it is not expected that modeled flows match the observed (metered) flows for every meter location at all times, but modeled flows at most meters should reasonably match the flow volumes and peak flows in the observed data. Model calibration is achieved first through comparing modeled versus metered flows during a dry weather (non-rainfall) period to achieve an accurate prediction of BWF and GWI, and then during a wet weather period to estimate the RDI/I response.

5.1 Dry Weather Calibration

The 7-day dry period from December 15 through December 21, 2022, was used as the dry weather calibration period for comparing flow data from the 2022/2023 flow monitoring program to model simulated flows. The primary focus of the dry weather calibration was to confirm that the calculated average BWF based on winter water consumption was consistent with the measured flows at the meter locations. The other objectives of the dry weather calibration were to confirm the flow routing in the system, particularly in areas where flow can be diverted in more than one direction (flow splits), as well as to confirm the diurnal profiles used to represent the hourly variations in BWF. The diurnal curves shown in **Figure 4-2** were developed and/or confirmed based on the calibration.

GWI was added when the observed (metered) dry weather hydrographs were greater than the model-simulated hydrographs by a relatively constant value throughout the day. GWI was applied in 4 of the 14 flow meter areas; estimated rates ranging from about 100 gpd/acre up to 525 gpd/acre were applied uniformly throughout selected flow meter areas for a total of 0.61 mgd of additional flow to the system. It should be noted that it may be difficult to assess the actual amount of GWI in any given area, as the relative accuracy of the flow monitoring data, water consumption data, and other model assumptions may affect the amount of flow attributed to GWI. However, this methodology is considered adequate for modeling purposes.

Table 5-1 compares the model versus meter average dry weather flow at each meter location, and **Figure 5-1** and **Figure 5-2** show plots of model versus metered dry weather flow for the total flow at the LS-6, and FM01 respectively. In these graphs, the green line represents the monitored (observed) flow and the red line represents the model-simulated flow. As indicated in **Table 5-1**, the dry weather model calibration resulted in a reasonably good match of modeled to metered flow (within 10 percent at most locations). Note that FM-2 was used in place of EALS flow data since it appears the lift station flows are lower than expected based on the data from FM-2 and FM-3.

Dry weather calibration plots of model-predicted versus metered flows at all flow meter and pump station locations are provided as **Appendix E**.

Table 5-1: Dry Weather Flow Calibration Results

Location	Incremental[a]				Total[b]					
	Incremental Contributing Area (acre)	GWI (gpd/acre)	Return Factor Applied (%)	Modeled BWF (mgd)	Total Contributing Area (acre)	Model BWF (mgd)	Meter ADWF (mgd)[c]	Model ADWF (mgd)	Difference (mgd)[d]	Difference (%)[d]
FM01	564	354	100%	0.51	564	0.51	0.74	0.68	-0.06	9%
FM02	569	527	100%	0.65	1392	2.03	2.47	2.33	-0.14	6%
FM03	640	0	90%	1.25	822	1.38	1.33	1.38	0.05	-4%
FM03A	183	0	70%	0.14	183	0.14	0.13	0.14	0.01	-8%
FM04	340	0	70%	0.21	1190	0.61	0.81	0.89	0.08	-9%
FM05	718	0	70%	0.59	1242	1.08	0.70	0.78	0.07	-10%
FM06	245	0	70%	0.20	245	0.20	0.47	0.49	0.02	-3%
FM07	524	0	100%	0.49	524	0.49	0.39	0.39	-0.01	2%
FM08	141	355	100%	0.12	1048	0.89	1.02	0.95	-0.07	7%
FM09	605	0	70%	0.20	605	0.20	0.19	0.20	0.01	-4%
FM10	262	0	100%	0.37	907	0.78	0.71	0.69	-0.02	2%
FM10A	369	108	100%	0.20	369	0.20	0.28	0.28	0.00	0%
FM11	276	0	80%	0.21	276	0.21	0.15	0.16	0.01	-4%
FM12	450	0	60%	0.15	450	0.15	0.13	0.15	0.02	-13%

a. Represents the incremental area and base wastewater flow of the meter's incremental sewershed (i.e., does not include areas that are upstream of tributary meters). Calibration parameters (GWI and return factor), are applied to the incremental area.
b. As measured at the meter. Contributing area represents the entire area tributary to the meter (including the area of tributary meters).
c. Meter ADWF is reported based on the 2022/2023 flow monitoring program.
d. Difference is reported as model flow minus meter flow.

Figure 5-1: Dry Weather Calibration Graph (FM01)

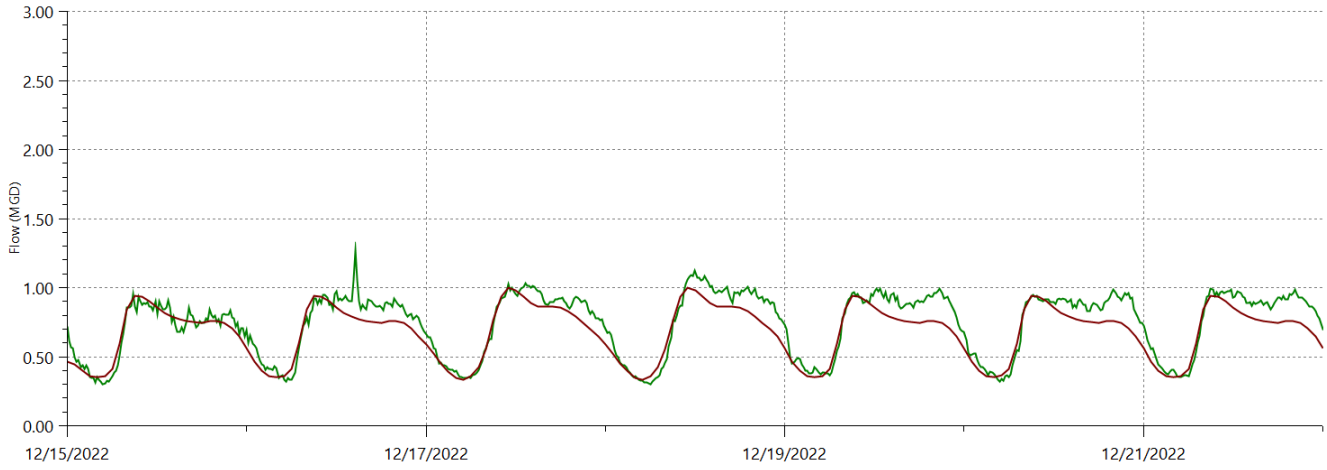


Figure 5-2: Dry Weather Calibration Graph (LS-6)

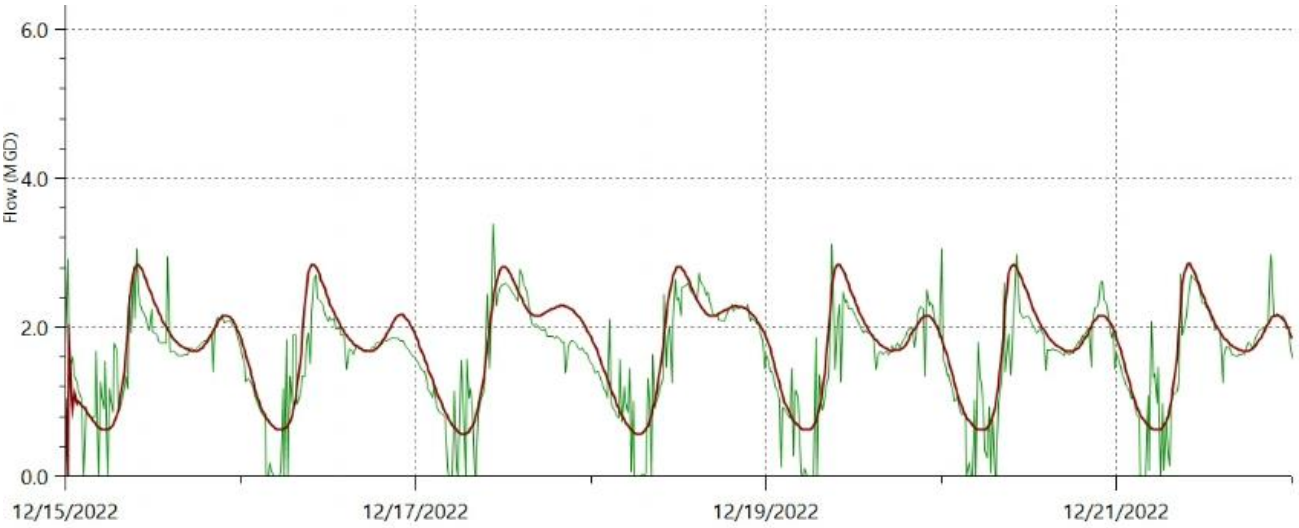


Table 5-2 summarizes the total estimated dry weather flow (DWF) within Pleasanton's sewer system based on the model calibration and the existing loads described previously.

Table 5-2: Dry Weather Flow Summary

Flow Component	Flow (mgd)
Residential BWF	4.03
Non-Residential BWF	1.30
Total Average BWF	**5.32**
Estimated GWI[a]	0.61
Total Average DWF	**5.93**

a. Calculated based on difference between metered non-rainfall period. Flows and estimated BWF calculated from winter water use data.

5.2 Wet Weather Calibration

During wet weather calibration, the percentage volume of each of five RDI/I components (pictured in **Figure 4-4**) are adjusted to simulate the volume and timing of RDI/I for monitored storm events in order to best match the overall wet weather hydrograph shape and magnitude of peak flows. To simulate a rainfall event in the model, rainfall is assigned to subcatchments using observed data from the closest available rain gauge. The model-predicted wet weather response, which is based on the assigned rainfall intensity and RDI/I components, is then compared to observed flows (typically either flow monitoring or pump station SCADA data). The flow monitoring program conducted in winter of 2022/2023 as part of this Capacity Evaluation (refer to **Chapter 3**) provided all the necessary data for wet weather calibration.

Through the wet weather calibration process, RDI/I hydrograph parameters were developed for each metered area. Wet weather calibration was primarily performed for the period from December 26, 2022, through January 17, 2023. Initial rainfall in late December allowed for wet antecedent conditions for the large December 31st storm event. Rainfall for key events referenced for the wet weather calibration is summarized in **Table 5-3**.

Table 5-3: Rainfall Events Referenced for Wet Weather Calibration[a]

Start of Event	End of Event	Duration (hr)	Total Rainfall (in)	Peak 1-Hour Intensity (in/hr)[b]	24-hour Max Rainfall (in)	24-hour Storm Return Period[c]
12/10/22	12/12/22	52	3.35	0.8	2.84	2 - 5 -yr
12/26/22	12/27/22	22	2.28	0.64	2.28	1 - 2 -yr
12/28/22	12/31/22	74	6.70	0.96	4.88	25 - 50 -yr
1/2/23	1/2/23	19	0.51	0.24	0.51	< 1-yr
1/4/23	1/5/23	26	2.30	0.72	1.86	< 1-yr
1/7/23	1/7/23	12	0.28	0.28	0.28	< 1-yr
1/8/23	1/8/23	21	1.89	0.64	1.89	1-yr
1/10/23	1/11/23	42	1.24	0.6	0.86	< 1-yr
1/13/23	1/16/23	80	4.33	0.64	2.24	1 - 2 -yr
1/18/23	1/18/23	11	0.23	0.16	0.23	< 1-yr
2/3/23	2/3/23	9	0.24	0.16	0.24	< 1-yr
2/4/23	2/5/23	29	1.17	0.44	0.93	< 1-yr

a. Rainfall totals are averaged from the 7 rainfall gauges installed during the flow monitoring period.
b. 1-hour intensity is reported as an hourly average of 15-minute rainfall data.
c. Approximate return period based on local NOAA 14 precipitation statistics and 24-hour rainfall total.

Results of the wet weather calibration for the wet weather flow periods discussed above are presented in **Appendix F,** which contains copies of the wet weather calibration graphs for the lift stations and flow meters. Graphs of the wet weather calibration results at FM-01 and LS-6 for the December-January wet weather calibration period are presented in **Figure 5-3** and **Figure 5-4**. The calibration graphs show that a reasonably good match was achieved at most flow meters for both peak flows and volume.

Figure 5-3: Wet Weather Calibration for December-January 2023 (FM01)

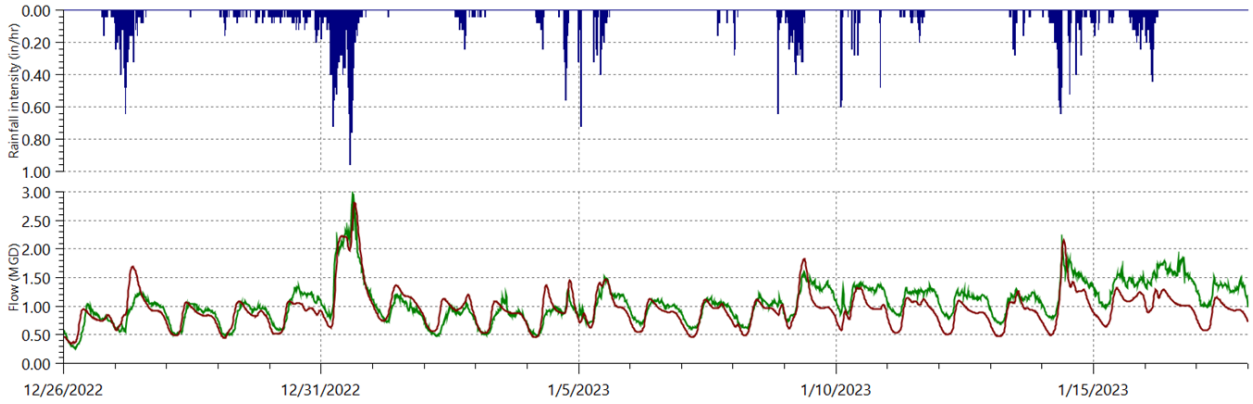
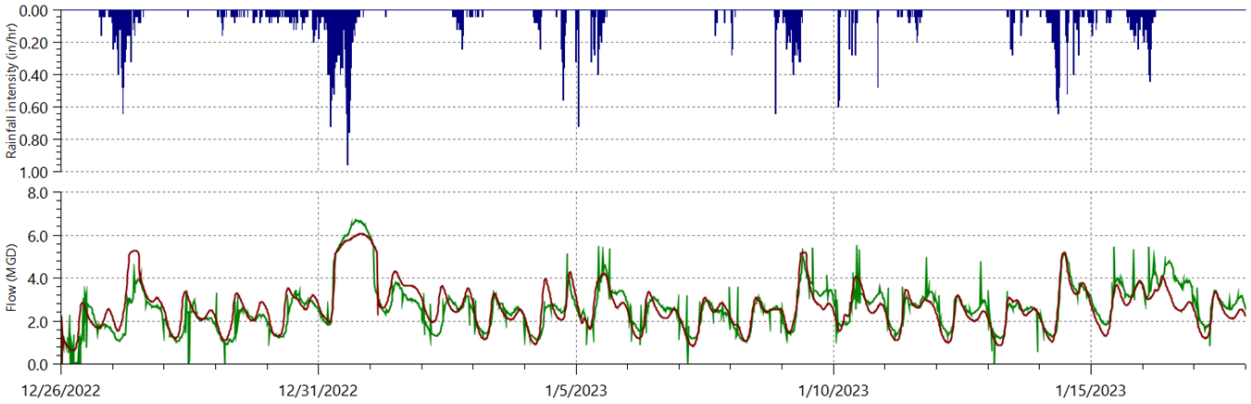


Figure 5-4: Wet Weather Calibration for December-January 2023 (LS-6)



5.2.1 Discussion of Specific Calibration Adjustments

Several flow meter areas required some specific calibration adjustments to better match surcharge conditions observed at the flow meters during the 12/31 event. LS-6 and LS-8 both backed up and resulted in upstream sewers surcharged during the event, indicating that the pump stations reached capacity and caused backup surcharge affecting upstream flowmeters (FM04, 05, 06, and 08). Flow meter 10A surcharged by approximately 3 feet during the event, likely due to capacity restrictions in the downstream sewer. The sections below discuss the specific approach to depth calibration for these meters.

5.2.1.1 Lift Station 8 and Flow Meter 8

As noted, LS-8 caused significant backup into upstream sewers during the 12/31 storm event. When LS-8 causes the upstream sewer to surcharge by approximately 8 feet, a bypass sewer located just upstream of

the pump station is activated, diverting some of the flow towards LS-6. Based on the level observed at FM08, this appeared to occur during the 12/31 event. The pump station was originally modeled using the pump curves provided by the City, and a Hazen-Williams coefficient of 100 was assumed for the force main, which matched the original testing performed in 2002. However, analysis of the runtime and flow data during the 12/31 event indicated substantially lower performance than predicted; therefore, in the model, the pumps have been derated by approximately 15 percent to more closely mimic actual performance.

In addition, FM08 flows appeared to be substantially lower than flows observed at the upstream meter (FM10) during wet weather periods, while flows observed by the LS-8 pump station meter were fairly consistent with FM10 flows. V&A was unable to find any reason for the discrepancy, so for calibration purposes, LS-8 flows were used rather than FM08 flows. However, the model is consistent with the surcharge observed by the FM08 depth data.

Further investigation and testing of the LS-8 pumps is recommended to assess pump performance and develop new pump curves as necessary.

5.2.1.2 Lift Station 6 and Flow Meters 5 and 6

LS-6 also caused significant backup during the 12/31 storm event, which resulted in significant surcharge at FM04, FM05 and FM06 (although no overflows). A pump station improvement project for LS-6 was completed in September 2010, which included new pumps. After installation, the pump impellers were modified by City staff to reduce ragging, though no subsequent testing was performed. The initial model for this pump station used the pump curves as originally designed for the improvement project, which resulted in minimal surcharging based on the anticipated flows. After reviewing pump station runtime, flow, and force main pressure data downstream of the pumps, the pump curves were derated in the model by about 15 percent to better approximate the surcharge and pump station capacity restrictions.

Further investigation and testing of the LS-6 pumps is recommended to assess pump performance and develop new pump curves.

5.2.1.3 Flow Meter 10A

As noted, FM10A surcharged by approximately 3 feet during the flow monitoring period. During initial calibration, it was not possible to match observed flows at the meter due to modeled capacity restrictions in the sewers both downstream and upstream of FM10A, resulting in excessive surcharge and model-predicted overflows upstream of the meter (restricting the ability of the model to convey flows to the FM10A location). Therefore, it was necessary to alleviate the capacity restriction in the model in order to better represent the flows actually being conveyed downstream. Manning's n values were decreased from 0.013 to 0.009 for the sewers on Sunol Boulevard (downstream and upstream of FM10A). However, because Manning's n values are subject to change based on changes in sediment composition and pipe condition, Manning's n was reverted to 0.013 for these segments for the design flow model runs discussed in Chapter 6.

6. CAPACITY ANALYSIS

The capacity performance of the system and potential need for capacity improvements were evaluated using the calibrated hydraulic model described in the previous chapters. This chapter discusses the criteria on which the capacity assessment was based and the results of the capacity analysis of the City's sanitary sewer system.

6.1 Design Flow and Performance Criteria

Sewer system capacity is assessed with respect to the system's performance under a design flow condition. The subsections below define the design flow criteria proposed for Pleasanton's capacity assessment and the criteria for assessing system performance and identifying system capacity deficiencies.

6.1.1 Design Storm Condition

The use of wet weather design events as the basis for sewer capacity evaluation is a well-accepted practice. The approach is to first calibrate a hydraulic model of the system to match wet weather flows from observed storm(s), and then apply the calibrated model to a design rainfall event to identify capacity deficiencies and size improvement projects. The design event may be synthesized from rainfall statistics or may be an actual historical rainfall event of appropriate duration and intensity. There is no regulatory standard for design return periods for wastewater collection systems; however, the majority of Bay Area agencies that have adopted a specific return period have selected return periods of 5, 10, or in some cases 20 years.

The temporal rainfall distribution of a design storm may be based on a synthetic storm or an actual historical event. Commonly used synthetic storm distributions include nested storms or "SCS" storm distribution. Nested storm distributions incorporate design rainfall intensities for a given return period for all durations within the total storm duration. They represent a synthetic storm distribution that is generated by placing the highest rainfall intensity at the center of the storm. Lower intensities are placed on alternating sides of the peak, until a complete curve is developed. This distribution is referred to as a nested storm because depths are nested inside each other. Another common distribution is an "SCS" storm distribution, a dimensionless rainfall distribution developed by the U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS), now known as the Natural Resources Conservation Service (NRCS)[1]. The SCS developed four synthetic rainfall distributions, with each distribution representative of a specific region of the U.S. Pleasanton falls within the "Type I" area, which includes southern and central California as well as the Bay Area.

Both nested and SCS design storms are considered conservative storms, intended for capacity analysis or facility design. These types of design storms do not represent statistical average values but are a more conservative or "worst case" temporal distribution for a storm of a given return period and duration.

Six storm events based on different return periods and temporal rainfall distributions that could be used as the design event for the capacity evaluation are listed below.

- A 10-year, 24-hour spatially varied design event developed using the SCS Type IA distribution.

[1] U.S. Department of Agriculture, Natural Resources Conservation Service, Urban Hydrology for Small Watersheds TR-55, Appendix B, June 1986.

- A 10-year, 24-hour spatially varied design event developed for the 2007 Master Plan.
- A 10-year, 24-hour spatially varied design event developed using a nested distribution. Based on NOAA Atlas 14 statistics.
- A 25-year, 24-hour spatially varied design event developed using a nested distribution. Based on NOAA Atlas 14 statistics.
- A 20-year, 6-hour spatially varied design event developed using the DSRSD design storm.
- A storm matching the 12/31/22 calibration storm. Based on NOAA Atlas 14 data this storm appears to be between a 25-year and 50-year, 24-hour storm.

Three of the design events considered were developed using rainfall statistics from NOAA Atlas 14-point precipitation frequency estimates[1] for the Pleasanton area. **Table 6-1** summarizes the total volume and peak intensity for each of these potential design events, as well as the predicted peak flow to the DSRSD WWTP when each design storm is simulated in the model. Note that the NOAA precipitation frequency estimates vary across the service area; values presented in **Table 6-1** represent the rainfall depth and intensity near the center of Pleasanton, but the modeled design storm rainfall would incorporate the spatial variation.

Table 6-1: Potential Design Storm Characteristics

Return Period/Duration	Temporal Distribution	Volume (in)	Duration (hours)	Peak Hour Intensity (in/hr)[a]	Modeled Peak 1-hour Flow at DSRSD WWTP (mgd)[b]
10-yr, 24-hr	SCS-IA	3.79[a]	24	0.54	14.7
2007 Master Plan, 10-yr, 24-hr	Unknown	4.82	24	1.04	20.8
10-yr, 24-hr	Nested	3.10[a]	24	0.7	16.8
25-yr, 24-hr	Nested	3.78[a]	24	0.85	20.8
20-yr, 6-hr (DSRSD)	Unknown	2.19	6	0.71	14.4
12/31/22 Calibration Storm	Monitored Storm	4.88[a]	24	0.64	20.8

a. Rainfall volume and intensity would vary spatially across the City.
b. Peak flows limited due to backup at LS-6 and LS-8.

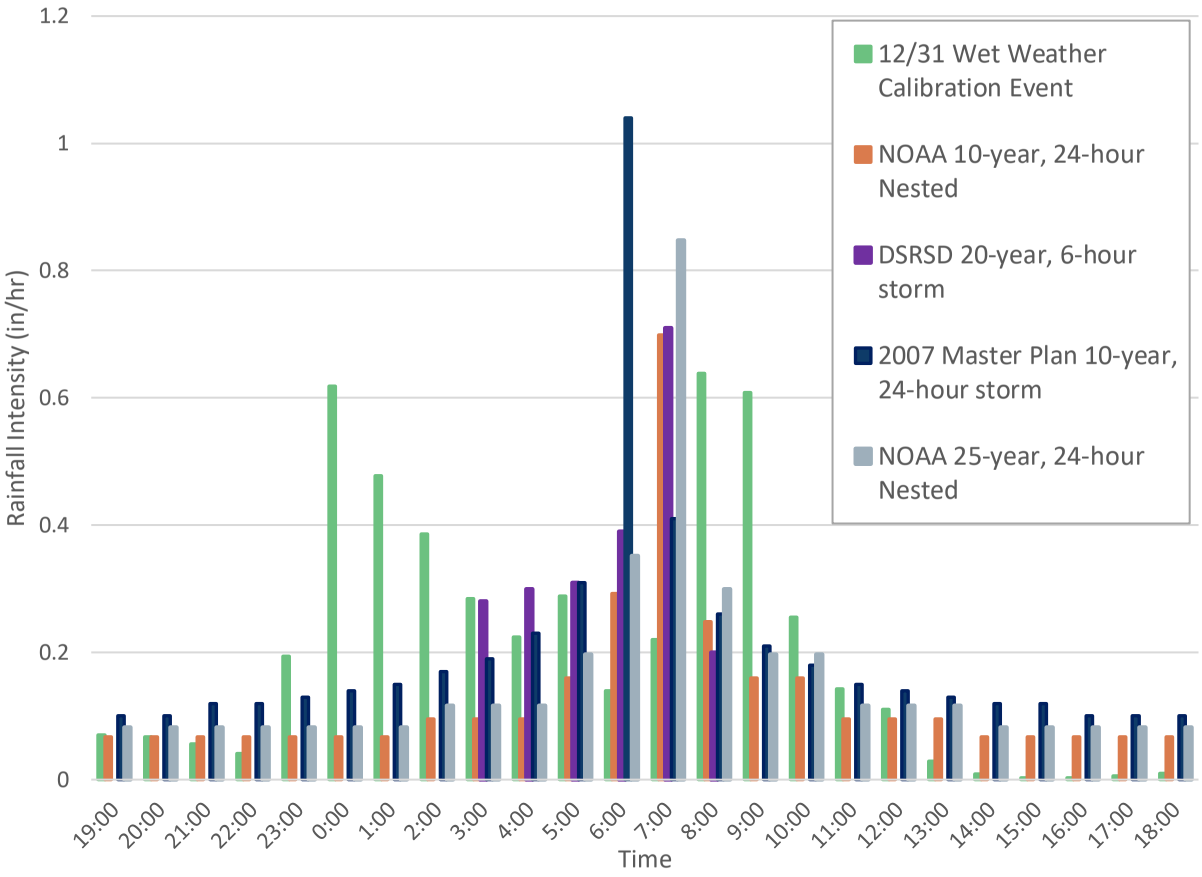
Figure 6-1 shows how the rainfall distributions (volume and intensity) compare for five of the different storm events considered and indicates that the 10-year, 24-hour 2007 Master Plan design event is the most intense.

The timing of the design storm also affects the resulting peak wastewater flows. The design storms considered were all timed to generate peak rainfall-dependent infiltration and inflow (RDI/I) at roughly the same time as peak BWF ("peak-on-peak"). The peak-on-peak timing generates a higher total peak wet weather flow than if the peak RDI/I generated by the design storm occurred at the time of the average or

[1] NOAA Atlas 14 Volume 6 Version 2.0 data available at: https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca

minimum BWF. Timing the storm to produce peak-on-peak results is generally thought to create a wastewater flow return period that is greater than the return period of the design rainfall event itself (e.g., the peak flow during a 10-year storm event occurring at the same time as peak BWF would occur less often than a 10-year storm occurring at any other time during the day). Therefore, peak-on-peak timing is a conservative assumption.

Figure 6-1: Comparison of Potential Design Storms



[1] Hour 7 represents 7 a.m. on a typical BWF diurnal profile. Peak BWF occurs at 8 a.m. allowing for peak RDI/I to coincide with peak BWF.

To facilitate selection of an appropriate design storm for the 2024 Capacity Evaluation, the model was run for the existing conditions scenario to simulate the flows in the system under each storm. Table 6-1 compares the resulting PWWF at the downstream end of the system (at the DSRSD WWTP) for each event. After discussions with City staff, it was decided that the design storm for this capacity evaluation should approximately match the peak modeled flows from the 12/31, calibration storm, while still being a synthetic, more statistically supportable storm, rather than an actual storm event. Using a synthetic design storm allows for a relatively straightforward path to updates to reflect future changes to precipitation frequency statistics.

To select a design storm that best met these criteria, a simple scoring matrix comparing the different design storms was developed, as shown in **Table 6-2** below. The selected categories for comparison included if its temporal distribution was understood and statically supported, total volume of rainfall in a 24-hour period,

storm duration, peak hour intensity, and peak 1-hour flow at the DSRSD treatment plant. The ideal storm would match the calibration event in all or most criteria while being a statically repeatable storm.

Table 6-2: Design Storm Comparison Matrix

Return Period/Duration	Criteria[a]					Total Score
	Statistics Based Rainfall Event	Total Rainfall Volume	Storm Duration	Peak Hour Intensity	Modeled Peak 1-hour Flow at DSRSD	
12/31/22 Calibration Storm[b]	0	5	5	5	5	NA
SCS-1A[c], 10-yr, 24-hr	3	3	5	4	2	17
2007 Master Plan[d], 10-yr, 24-hr	2	5	5	2	5	19
Nested 10-yr, 24-hr	5	2	5	4	3	19
Nested 25-yr, 24-hr	**5**	**3**	**5**	**3**	**5**	**21**
20-yr, 6-hr (DSRSD)[d]	2	2	1	4	2	11

a. The criteria were scored from 1 – 5, with 5 being best. A higher score was given to storms that most closely resembled the calibration storm.
b. The calibration storm is the standard by which other storms are compared.
c. The SCS-1A method is a statistically based storm that is now out of date, but still widely used.
d. It is unclear what statistical method was used to develop these storms.

Based on the findings in the design storm scoring matrix, the City selected the 25-year, 24-hour spatially varied nested design rainfall event, with "peak-on-peak" timing, for this study, as it closely matches the results from the 12/31, calibration event. It should be noted that using the 25-year, 24-hour nested design event in combination with an assumed wet antecedent condition (as reflected in the model calibration approach described in **Chapter 5**) results in relatively conservative predicted peak wet weather flows, and is generally more conservative than the design storms used by most agencies in the Bay Area. Using a more conservative design storm should result in a somewhat reduced risk of capacity-driven overflows.

6.1.2 Capacity Deficiency Criteria

Capacity deficiency or performance criteria are used to determine when the capacity of a sewer pipeline or pump station is exceeded to the extent that a capacity improvement project (e.g., a relief sewer, larger replacement sewer, or pump station expansion) is required. Capacity deficiency criteria are sometimes called "trigger" criteria in that they trigger the need for a capacity improvement project. These criteria may differ from "design criteria" that are applied to determine the size of a new facility, which may be more conservative than the trigger criteria.

It is important that the capacity deficiency criteria be coordinated with the peak design flow criteria. For example, if the peak design flow considers only peak dry weather flow (PDWF) and little or no I/I, the deficiency criteria should be conservative (e.g., require pipes to flow less than full under dry weather flow to allow capacity for I/I that may increase the flow under a wet weather condition). On the other hand, if

the peak design flow includes I/I from a large, relatively infrequent design storm event, it is appropriate to allow the sewers to flow full or even surcharged to some extent, since the peak flows will be infrequent and brief in duration.

For this Capacity Evaluation, a capacity deficiency was identified under the following conditions:

- Any pipe exceeding a flow depth to pipe diameter ratio (d/D) of 0.75 under PDWF.
- Any modeled overflows or surcharge reaching to within about 3 feet of manhole rims under design storm PWWF. However, if surcharge in existing trunk sewers is triggered solely by future development, then the City would consider any surcharge to be a capacity deficiency requiring a relief project before additional development could be connected to the system.

Note that any new pipes proposed would need to be designed to convey design storm PWWF at a d/D of 0.75 or less, where feasible.

Because the design condition represents a relatively infrequent storm event, the criterion applied allowed surcharging up to about 3 feet of the manhole rims under the 25-year, 24-hour nested design storm PWWF. While 3 feet is less conservative than some agencies use, the City has chosen a larger design storm; therefore, more modeled surcharge would be expected. Additionally, this criteria is more conservative than the City's 2007 Master Plan criteria, which used 1 foot within the manhole rim to define deficiencies. However, if an improvement project is developed, the improvement project would be sized to eliminate all surcharging at the capacity deficiency location. **Table 6-3** summarizes some common capacity deficiency criteria used by South Bay Area agencies.

Table 6-3: Common Capacity Deficiency Criteria for California Agencies in the South Bay Area

Agency (year of report)	PDWF	PWWF
City of Santa Clara (2016)	No surcharge allowed (d/D ≤ 1.0)	- Pipe cover < 6 feet: No surcharge allowed (d/D ≤ 1.0) - Pipe cover ≥ 6 feet: Surcharge up to 1 foot above crown allowed
City of San Jose (2013)	No surcharge allowed (d/D ≤ 0.9)	- Diameter < 18-inch: Minimal surcharge allowed (d/D ≤ 1.1) - Diameter ≥ 18-inch: Surcharge allowed up to 20 percent of the cover over the pipe, with at least 4 feet of freeboard (interceptor system uses different criteria, not applicable to typical system)
City of Sunnyvale (2023)	No surcharge allowed (d/D ≤ 1.0)	Minimum freeboard = 5 feet (no stormwater scenarios). No overflows allowed (with stormwater scenarios)
City of Mountain View (2010)	Unknown	- Diameter ≤ 12-inch: Allowed to flow ½ full (d/D ≤ 0.5) - Diameter > 12-inch: Allowed to flow ¾ full (d/D ≤ 0.75)
City of Milpitas (2021)	Unknown	Minimum freeboard = 5 feet
West Valley Sanitation District (2018)	- Diameter ≤ 15-inch: Allowed to flow ¾ full (d/D ≤ 0.75) - Diameter > 15-inch: No surcharge allowed (d/D ≤ 1.0)	- Diameter ≤ 15-inch: No surcharge allowed (d/D ≤ 1.0), except on a case-by-case basis for deep pipes. - Diameter > 15-inch: Surcharge allowed up to 1 foot above crown, where freeboard ≥ 5 feet.

For this capacity evaluation, pump stations were considered capacity deficient if the peak design flow would result in backup and surcharging reaching within about 3 feet of upstream manhole rims with the largest pump out of service. Force mains are considered to be deficient if the velocity under peak design flow exceeds 8 to 10 feet per second (fps).

6.2 Capacity Analysis Results

The calibrated model was run for existing and future conditions to identify areas of the system that fail to meet the specified performance criteria under PDWF and the design storm PWWF. **Figure 6-2** and **Figure 6-3** present model results for future PDWF and design storm PWWF conditions. The figures show pipes that are not surcharged, as well as pipes that are predicted to surcharge due to a throttle condition (peak flow greater than full pipe capacity) or due to backwater from a downstream throttle.

The model did not predict capacity issues under existing or future PDWF conditions; therefore, the remaining capacity analysis discussion in this report focuses on the design storm PWWF results.

6.3 Gravity Sewer System Capacity Deficiencies and Improvement Projects

Based on the criteria presented in **Chapter 6.1.2** and the results of the capacity evaluation, there are two areas that may be considered capacity deficient under existing design storm PWWF conditions, and two additional areas that would become capacity deficient in the future based on increased flows due to future development. **Table 6-4** summarizes the results for these four areas under the future load scenario. Capacity projects to address each of these capacity deficient areas are described in detail below.

Table 6-4: Summary of Model-Predicted Gravity Sewer Capacity Deficiencies

Deficiency Location	Exist. Diam. (in)	Predicted Deficiency [Freeboard, (ft), Overflow (gal[a])]	Capacity Project Number	Project Description	Estimated Project Cost
Sunol Boulevard from Junipero Street to manholes SC6B2M409, SC6D2M200, and SC6D2M300 near Monaco Drive	10	Overflow 1,800	1A	Connect existing Sunol Boulevard sewer to the private sewer northwest of Sunol Boulevard and Valley Avenue intersection.	$2,792,000
			1B	Upsize existing sewer in Sunol Boulevard.	$1,528,000
Various pipe segments along Bernal Avenue, Vineyard Avenue, and Palomino Drive	8	2.8 N/A	2A	Connect sewer in Bernal Ave to existing 18-inch sewer in Nevada street via pipe bridge over Arroyo Valle.	$2,792,000
			2B	Convey flow from the intersection of Bernal Avenue and Vineyard Avenue down Vine Street.	$1,528,000
			2C	Proposed relief sewer on Vineyard Avenue to convey flow north to 1st Street to LS-6 sewershed.	$5,566,000
			2D	Proposed relief sewer on Vineyard Avenue to convey flow north to 1st Street to LS-7 sewershed.	$5,566,000
Sewer along Stoneridge Mall Road and Stonedale Drive Sewer	10	12[b] N/A	3	Upsize existing 10-inch sewer in Stoneridge Mall Road and Stonedale Drive to 15-inch.	$3,000,000
Upsize Sewer Pipes on Kamp and Stoneridge Drives	10	9.2[b] N/A	4	Upsize existing 10-inch sewer in Kamp Drive and Stoneridge Drive to 12-inch.	$2,019,000

a. Under future flow conditions.
b. Project required because of surcharge that is triggered solely by future development.

Figure 6-2: Dry Weather Capacity Results

Pleasanton Capacity Evaluation Report

N

Legend

- EALS Pump Station
- Sewer Lift Station

Modeled Pipe Surcharge

- d/D ≤ 0.74
- d/D > 0.75
- City Force Main

0 0.25 0.5 1 Miles

EALS Pump Station

6 8 5 7 Pleasanton 4 13 15 11 12 14 10 2

Woodard & Curran

THE CITY OF PLEASANTON

Map Created: October 2024

Figure 6-3: Wet Weather Capacity Results

Pleasanton Capacity Evaluation Report

Surcharge caused by future development. Capacity project 3.

Backup surcharge at lift stations 6 and 8. No capacity projects are required because there is no surcharge within 3ft of a manhole rim.

Surcharge caused by future development. Capacity project 4.

Surcharge within 3ft of the Manhole rim. Capacity Project 2.

Modeled Overflow at MHs SC6B2M409, SC6D2M200, and SC6D2M300. Capacity Project 1.

EALS Pump Station

Legend

Gravity Main Surcharge State

- No Surcharge (d/D < 1)
- Backup Surcharge (d/D = 1)
- Throttle Surcharge (d/D = 1)
- City Force Main
- Private Force Main
- Modeled Overflow

0 0.25 0.5 1 Miles

Map Created: October 2024

6.3.1 Capacity Project 1 - Sunol Boulevard

As indicated in **Table 6-4** and **Figure 6-3**, the model predicts an overflow at manholes SC6B2M409, SC6D2M200, and SC6D2M300. This section of pipe had its Manning's roughness coefficient (n) value adjusted during calibration as discussed in **Chapter 5.2.1** of this report. For the capacity assessment, the Manning's roughness coefficient value was changed back to the standard value of 0.013 to be more conservative. A profile of the modeled pipe section is shown in **Appendix F**. The predicted overflow is due to throttle surcharge from manholes SC6B2M409 to SC6D2M100 along Sunol Boulevard, a result of existing capacity and pipe condition. A section of Sunol Boulevard was also identified as capacity deficient in the 2007 Master Plan. Two alternatives were identified to increase capacity and avoid overflows. Each alternative is summarized below and in **Table 6-5**. A map showing the alternatives is included in **Appendix F**.

6.3.1.1 Alternative 1A – Sunol-Valley Connector

Alternative 1A would increase capacity by connecting the existing sewer Sunol Boulevard to the private sewer located in the former railroad easement northwest of the intersection of Sunol Boulevard and Valley Avenue. The existing sewer in the easement would need to be upsized to accommodate the additional flow, but this alternative would avoid major construction in Sunol Boulevard and would not require bypass pumping.

6.3.1.2 Alternative 1B – Upsize Sunol Boulevard Sewers

Alternative 1B would increase capacity by upsizing the existing sewer in Sunol Boulevard. This alternative would require bypass pumping and construction in Sunol Boulevard. No new alignment would be required, but construction would impact local traffic, and utility coordination would be required when the pipe is upsized.

Table 6-5: Summary of Sunol Boulevard Capacity Improvement Projects

Project ID	Existing Diameter (in)	New Diameter (in)	Length of New Pipe (ft)	Estimated Construction Cost[a]	Estimated Project Cost[b]
1A	10	12	3,000	$2,234,000	$2,792,000
1B	10	15	1,400	$1,222,000	$1,528,000

a. Based on March 2024 ENR CCI Index. Includes assumptions for traffic control (10%), mobilization and demobilization (5%), and construction contingency (30%).
b. Includes assumptions for Engineering, Administration, and Legal costs. These costs are added as an additional 25% to the Estimated Construction Cost.

Alternative 1B is the preferred alternative based on its relatively lower project cost and would avoid the potential difficulties of taking ownership of the non-City sewer located in the former railroad easement under Alternative 1A.

6.3.2 Capacity Project 2 – Arroyo Valle (Bernal Avenue, Vineyard Avenue, and Palomino Drive)

As shown in **Table 6-4** and **Figure 6-3**, the model predicts surcharge to within 3-feet of the manhole rim on Palomino Drive during the design storm event. A profile of the modeled pipe section is shown in **Appendix F**. This surcharge is due to a combination of throttle surcharge and backup surcharge along the sewer parallel to Arroyo Valle, Bernal Avenue, and Palomino Drive. However, most of the modeled surcharge is well below the 3-foot capacity deficiency threshold**.** Much of the existing flow is routed through backyard/easement sewers parallel to Arroyo Valle, which presents a construction challenge when upsizing pipe, and it may be beneficial to reduce flows in these sewers because of the pipe's proximity to the Arroyo. A section of Bernal Avenue was identified as capacity deficient in the 2007 Master Plan. Several alternatives were identified for this deficiency, which are summarized below and in **Table 6-6**. A map of alternatives is included in **Appendix F**.

6.3.2.1 Alternative 2A – Bernal Avenue Pipe Bridge

Alternative 2A would increase capacity by connecting the sewer in Bernal Ave to the existing 18-inch sewer in Nevada street via a pipe bridge over Arroyo Valle. This alternative would use the new 18-inch trunk main in Nevada Street and matches the concept laid out in the 2007 Master Plan. However, at the time of this writing, it is understood that the sewer on the Bernal Avenue bridge has been removed and replaced with a water main. This alternative therefore assumes a new pipe bridge would be required on the Bernal Avenue bridge parallel to the water main in a separate casing. This alternative would convey flow to 1st Street and relieve capacity deficiencies in Vine Street, Vineyard Avenue, Bernal Avenue, and Palomino Drive. This alternative would also reduce the total flow in the sewers that parallel the Arroyo in the existing backyards.

6.3.2.2 Alternative 2B – Vineyard Street Relief Sewer

Alternative 2B would relieve the capacity deficiencies in Bernal Avenue and in the developments north of Vine Street by conveying flow from the intersection of Bernal Avenue and Vineyard Avenue down Vine Street and connecting to the sewer northwest of Birch Creek Terrace. The sewer on Vine Street may be difficult to construct as the street is narrow and divided into two parts by what appears to be a small section of private land between the two east-west sections of the street. Based on a preliminary investigation, it appears that the City has an existing easement through this area, but fencing and structures may have been built on top of the existing easement and sewer. This alternative would reduce total flow in the sewers that parallel the Arroyo compared to the existing conditions but would reconnect to the existing sewer in an easement northwest of Birch Creek Terrace. Therefore, total flows from MH 40503318 to MH 40503336 would match existing conditions.

6.3.2.3 Alternative 2C – Vine Street Relief Sewer (LS-6 Sewershed)

Alternative 2C proposes a relief sewer west on Vineyard Avenue to relieve flow from the connection at Bernal Avenue and Vineyard Avenue and convey the flow north to 1st Street. Due to existing invert elevations, this sewer would be relatively deep, and costs have been adjusted to account for the depth required for this sewer. This alternative would convey flow to the Lift Station 6 sewershed which currently backs up quite significantly during the design storm. A similar alterative (Alternative 2D)would convey flow to the Lift Station 7 sewershed, which is less heavily impacted. This alternative would also reduce the total flow in the sewers that parallel the Arroyo in the existing backyards.

6.3.2.4 Alternative 2D – Vine Street Relief Sewer (LS-7 Sewershed)

Alternative 2D proposes a relief sewer west on Vineyard Avenue to relieve flow from the connection at Bernal Avenue and Vineyard Avenue and convey the flow north to 1st Street. Due to existing invert elevations, this sewer would be relatively deep, and costs have been adjusted to account for the depth required for this sewer. This alternative would convey flow to the Lift Station 7 sewershed. This alternative would also reduce the total flow in the sewers that parallel the Arroyo in the existing backyards. The relative costs for alternatives 2C and 2D are nearly identical. However, alternative 2D may be preferred over alternative 2C, due to limited capacity at LS-6 (though both alternatives are substantially more expensive than alternative 2B).

Table 6-6: Summary of Arroyo Valle Capacity Improvement Projects

Project ID	Existing Diameter (in)	New Diameter (in)	Length of New Pipe (ft)	Estimated Construction Cost[a]	Estimated Project Cost[b]
2A	10	12	3,000	$2,234,000	$2,792,000
2B	10	15	1,400	$1,222,000	$1,528,000
2C	No existing pipe replaced	12	4,500	$4,452,000	$5,566,000
2D	No existing pipe replaced	12	4,500	$4,452,000	$5,566,000

a. Based on March 2024 ENR CCI Index. Includes assumptions for traffic control (10%), mobilization and demobilization (5%), and construction contingency (30%).
b. Includes assumptions for Engineering, Administration, and Legal costs. These costs are added as an additional 25% to the Estimated Construction Cost.

6.3.3 Capacity Project 3 – Stoneridge Mall

As shown in **Table 6-4** and **Figure 6-3**, the model predicts surcharge on Stoneridge Drive during the design storm event under future conditions, including the Housing Element Rezone Site 2 at the Stoneridge Shopping Center. A profile of the modeled pipe section is shown in **Appendix F**. This surcharge is due to a combination of throttle surcharge and backup surcharge along the sewer located along Stoneridge Mall Road and Stonedale Drive. However, although all of the modeled surcharge is well below the 3-foot threshold (freeboard under PWWF would be about 12 feet)**,** this section of pipe triggers a capacity project because the surcharge is caused by new developments upstream of the pipe, where there was no previous surcharge. This would require the sewer segment to be upsized per the City's criteria. This sewer was not identified as capacity deficient in the 2007 Master Plan. The project is summarized below and in **Table 6-7**. A map is included in **Appendix F**.

The Stoneridge Mall project will increase capacity by upsizing the existing 10-inch sewer Stoneridge Mall Road and Stonedale Drive to a 15-inch sewer. This project would require bypass pumping and construction along Stoneridge Mall Road, Stoneridge Drive, and Stonedale Drive Sewer.

Table 6-7: Summary of Stoneridge Mall Capacity Improvement Project

Project ID	Existing Diameter (in)	New Diameter (in)	Length of New Pipe (ft)	Estimated Construction Cost[a]	Estimated Project Cost[b]
3	10	15	1,300	$2,400,000	$3,000,000

a. Based on March 2024 ENR CCI Index. Includes assumptions for traffic control (10%), mobilization and demobilization (5%), and construction contingency (30%).
b. Includes assumptions for Engineering, Administration, and Legal costs. These costs are added as an additional 25% to the Estimated Construction Cost.

6.3.4 Capacity Project 4 – Upsize Sewers in Kamp Drive and Stoneridge Drive

As shown in **Table 6-4** and **Figure 6-3**, the model predicts surcharge on Stoneridge Drive during the design storm event. A profile of the modeled pipe section is shown in **Appendix F**. This surcharge is due to a combination of throttle surcharge and backup surcharge along the sewer parallel to Stoneridge Mall Road and Stonedale Drive Sewer. However, although all the modeled surcharge is well below the 3-foot threshold (freeboard under PWWF would be about 9 feet)**,** this section of pipe triggers a capacity project because the surcharge is caused by new developments upstream of the pipe, where there was no previous surcharge. This would require the sewer segment to be upsized per the City's criteria. This project was identified as capacity deficiency in the 2007 Master Plan. The project is summarized below and in **Table 6-8**. A map is included in **Appendix F**.

The Kamp Drive and Stoneridge Drive capacity project would increase capacity by upsizing the existing 10-inch sewer in Kamp Drive and Stoneridge Drive to a 12-inch sewer. This alternative would require bypass pumping and construction along Kamp Drive and Stoneridge Drive.

Table 6-8: Summary of Kamp and Stoneridge Drive Capacity Improvement Project

Project ID	Existing Diameter (in)	New Diameter (in)	Length of New Pipe (ft)	Estimated Construction Cost[a]	Estimated Project Cost[b]
4	10	12	1,200	$1,615,000	$2,019,000

a. Based on March 2024 ENR CCI Index. Includes assumptions for traffic control (10%), mobilization and demobilization (5%), and construction contingency (30%).
b. Includes assumptions for Engineering, Administration, and Legal costs. These costs are added as an additional 25% to the Estimated Construction Cost.

6.4 Pump Station and Force Main Capacity Analysis Results

Based on the criteria presented in **Chapter 6.1.2** and the results of the capacity evaluation, LS-6 and LS-8 are not considered capacity deficient. Model results are summarized in **Table 6-9** and described in detail below.

Table 6-9: Summary Of Pump Station And Force Main Model Results

Lift Station	Future Model PWWF (mgd)	Model Firm Capacity (mgd)[a]	Predicted Upstream Freeboard (ft)	Capacity Deficiency?
LS-2	0.09	0.19	9.4	No
LS-4	0.15	0.55	17	No
LS-5	1.5	2.1	19	No
LS-6	6.0	5.2[b]	4.3	No[g]
LS-7	4.3	7.5	20	No[g]
LS-8	4.6	3.4[c]	8.1	No[g]
LS-10	0.17	0.35	31	No
LS-12	0.35	0.55	22	No
LS-14	0.13	0.22[d]	10	No
LS-15	0.46	N/A[e]	21	No
EALS	8.05	N/A[f]	20	N/A

a. Firm capacity is defined as the capacity with the largest pump out of service. Unless otherwise noted, firm capacity is based on Table 6.3 of the 2007 Master Plan.
b. Based on SCADA data, LS-6 Firm capacity without backup surcharge is approximately 5 mgd. However the station can flow up to approximately 6.1 mgd without causing backup surcharge to exceed the City's criteria. LS-6's rated capacity based on pump curves is 6.6 mgd. LS-6 is discussed further below.
c. LS-8 firm capacity as reported in the 2007 Master Plan is 4.0 mgd, but backup surcharge is diverted through an upstream diversion structure to a gravity sewer flowing to LS-6. Review of SCADA data indicated actual capacity is consistent with reported capacity. LS-8 is discussed further below.
d. LS-14 firm capacity is based on pump curve and record drawing information provided by the City.
e. Where total capacity and firm capacity was not known from pump testing, as-builts, or the 2007 Master Plan, the modeled pumps were set as "pass through" pumps, or pumps with an extremely high firm capacity to so no backups would occur under PDWF or PWWF.
f. Capacity limitations of EALS was not modeled. See below for further discussion.
g. Although modeled PWWF would exceed firm capacity, backup surcharge would not exceed City's capacity deficiency criteria.

6.4.1 Lift Station 6

During the 12/31, event, LS-6 appeared to reach capacity and stayed at capacity for approximately 3 hours, resulting in significant backup surcharge. This prompted further investigation – when comparing the SCADA flow rate and pump speed, the pumps all appeared to fall short of the "Guaranteed" speed shown on the LS-6 pump curves provided by the City. Each pump conveyed approximately 1,000 gpm of flow when running at full speed but based on the lift station's system curve and the system curve included in the conformed design documents, the expected flow rate for each pump was 1,600 gpm. This reduced flow was true for all the pumps at the lift station. A brief supplemental investigation into the pressure readings for each pump was performed. Based on the results, there were no signs of obstructions or unexpected

headloss in the forcemain. This could mean that the issue is the pumps themselves, but further investigation is necessary for determining the root cause. As shown in **Table 6-9**, LS-6 had an expected firm capacity of approximately 6.6 mgd with four (4) of its five (5) pumps running.

However, the LS-6 wet well and upstream sewers are relatively deep, which allows the station to surcharge significantly without overflowing. Further, because the force main is relatively flat, the reduction in static head as the water level in the wet well rises substantially increases the capacity of the pump station. As a result, although the station is expected to surcharge significantly during the design event, the surcharge is not predicted to exceed the City's capacity criteria.

The existing forcemain downstream of LS-6 was not predicted to experience velocities of greater than 6.5 fps, and therefore would not require any capacity improvements.

6.4.2 Lift Station 8

During the 12/31, calibration storm event, LS-8 reached its capacity and caused flow to back up several feet into the upstream sewer network for several hours. The flow at the LS-8 maxed out at 4.29 mgd (2,970 gpm). Based on the SCADA data provided by the City, all three pumps ran during the wet weather calibration storm. It is also unclear which pumps are currently installed in LS-8. Based on the provided SCADA data, pump 1 conveyed an average of 2,020 gpm, while pumps 2 and 3 conveyed 1,210 and 1,520 gpm respectively. Assuming a firm capacity using pumps 2 and 3 (largest pump out of service), the lift station does not have the firm capacity to convey the design storm without backing up into the sewer system. There is a high flow bypass located upstream of LS-8 that allows flow to enter the LS-6 sewershed. The backup into the sewer system also did not result in a predicted freeboard of less than 3 feet at any of the upstream manholes effected by the backup surcharge. This indicates that a capacity improvement is not required for LS-8. It should also be noted that this pump station was also listed as capacity deficient in the 2007 Master Plan.

The existing force main downstream of LS-8 was not predicted to experience velocities of greater than 4 fps, and therefore would not require any capacity improvements.

6.4.3 East Amador Lift Station (EALS) and East Amador Relief Sewer (EARS)

East Amador Lift Station is owned and operated by DSRSD, although it conveys flows only from the City of Pleasanton. During the 12/31, calibration storm event, EALS reached its capacity and caused flow to back up to within 8 feet of the manhole rim into the upstream sewer network for several hours. The backup into the sewer system did not result in a predicted freeboard of less than 3 feet at any of the upstream manholes effected by the backup surcharge.

This pump station was identified as a capacity deficiency in the 2007 Master Plan, with an existing PWWF of 6.7 mgd, projected future PWWF of 7.6 mgd, firm capacity of 3.6 mgd, and a total capacity of 7.2 mgd. The current version of the model predicts an existing PWWF of 7.4 mgd and a future PWWF of 8.0 mgd. No improvements have been implemented at this pump station since the 2007 Master Plan.

Based on these results, it is likely that a capacity improvement for EALS is needed.

East Amador Relief Sewer was constructed by the City of Pleasanton in 1984 but has not been used. The elevation of the sewer is several feet below the elevation of the Cross-Town Interceptor, which drains into EALS and runs roughly parallel to EARS. Therefore, activating the sewer would require a new lift station and

additional piping to convey flow to either EALS or the WWTF. In the 2007 Master Plan, the Cross-Town Interceptor was not identified as a capacity deficiency, although that report noted that future growth could result in a need for additional sewer capacity. The 2007 Master Plan recommended activation of EARS and installing a new EARS PS and force main in lieu of an upgrade of EALS.

The current master plan also does not project any capacity deficiencies in the Cross-Town Interceptor. Based on sensitivity analyses performed for the City with alternative growth scenarios in East Pleasanton, it is not anticipated that there will be a need for relief of the Cross-Town Interceptor. Therefore, the City should consider options for abandoning EARS.

As EALS is not owned by the City, capacity of EALS has not been re-evaluated in the current study. The City should work with DSRSD to assess the condition and capacity of the pump station to determine future improvement needs.

6.5 Siphon Deficiencies and Condition

Based on the future loads scenario, all of the City's siphons have sufficient capacity for the future loads PWWF scenario except for the Nobhill siphon. The model-predicted backup surcharge upstream of the siphon is approximately 1-inch, so a capacity project is not recommended. The flow each siphon conveys is listed in **Table 6-10** below. Note the results assume the siphons are clean and free of major debris. If siphons become clogged, their capacity would be reduced and may result in back up of flow into upstream sewers. Placing SmartCovers® or similar depth sensors upstream of siphons is recommended to monitor for sediment-related backups.

Table 6-10: Siphon Flow

Siphon Name	Number of Barrels	Future Loads ADWF (mgd)	Future Loads PWWF (mgd)	Modeled Surcharge Upstream of the Siphon during PWWF[a]
Amberwood	Single	0.2	0.4	No
Highland Oaks	Double	1.0	2.3	No
Laguna Creek	Double	0.01	0.02	No
Meadowlark	Single	0.1	0.4	No[b]
Nobhill	Double	0.7	1.2	Yes[c]
Laguna Vista	Single	0.1	0.6	No
S-8	Double	0.3	2.1	No[b]
West Los Positas	Single	0.4	0.6	No

a. The model does not account for any sediment accumulation in the siphon.
b. The model shows surcharge upstream and downstream of the siphon. The siphon itself has capacity for the PWWF.
c. Nobhill siphon is slightly under capacity during PWWF in the future loads scenario. The siphon causes a backup of approximately 1 inch in the upstream sewer.

At this time, there is no condition information available for the City's siphons, as it can be difficult to clean and inspect siphons. An inspection and cleaning program is recommended for the siphons to understand their condition; that program will be discussed in a sperate study focused on sewer system condition.

6.6 Capacity Results Identified in the 2007 Master Plan

A capacity analysis was performed as part of the 2007 Master Plan. A summary of the projects identified as part of that analysis are included in **Appendix G.** Appendix G also compares the results of the 2007 Master Plan with the results from the current model. Differences between identified projects are due to a combination of factors including:

- Some projects identified in the 2007 Master Plan have already been implemented.
    - Lift Station 6 was upgraded
- Different design storm intensities.
    - The peak rainfall for the design storm used in the 2007 Master Plan (0.19 inches/hour) is 22 percent is higher than the 25-year nested design storm based on NOAA Atlas 14 rainfall statistics used in this analysis (for details on why the 25-year design storm was selected see Chapter 6.1.1). This difference in peak rainfall and I/I assumptions results in slightly different wet weather behavior between the two models.
- Number of pipes in the model (all pipe model vs a trunk model).
    - Because the model used for this capacity evaluation is an all-pipe model, the additional pipes provide storage in the sewer system as downstream pipes begin to surcharge. This additional storage was not accounted for in the 2007 Master Plan model, which was a built using primarily 10-inch or larger pipes. This extra storage helps reduce surcharge and may be a factor for why some projects were not flagged as capacity improvements in this study.
- Different future load assumptions.
    - In the 2007 Master Plan, future ADWF at buildout was determined to be 7.91 mgd compared to the 6.42 mgd calculated for this Capacity Evaluation, while existing flows are fairly similar. The 2007 Master Plan used a generalized approach for estimating future loads, based on typical land use-based flow factors and the City's potential service area (including some areas outside of the City boundary) to estimate future loads, while the current master plan used parcel specific data for each proposed development. This difference in approach resulted in higher flow estimates in the 2007 Master Plan , which were likely a large driver for several of the capacity projects that were not identified as capacity deficiencies in this study.

6.7 Infiltration/Inflow

A summary of modeled flows for the 25-year, 24-hour nested design storm, including the resulting peak I/I and peak wet weather flow (PWWF), I/I per linear foot of pipe, and wet weather peaking factor for each flow meter area, is presented in **Table 6-10** below. I/I was not assumed to increase in future load scenarios because most of the new developments will connect to existing sewer mains, and laterals installed as part of future developments will likely be constructed of more watertight, plastic materials and are therefore assumed to contribute minimal I/I. It is also assumed that increases in I/I due to deterioration of existing sewers would be offset by reductions in I/I due to the City's ongoing sewer repair and rehabilitation efforts, keeping I/I levels at approximately their current rates.

Table 6-11: Design Flow I/I and Peaking Factor by Flow Meter

Flow Meter ID	Upstream Meter	Approximate Sewer Length (miles)[b]	ADWF (mgd)	Peak I/I (mgd)	Peak WWF (mgd)	Peak I/I (gpd/ft)	Peaking Factor[a]
FM01		27.0	1.10	2.20	3.31	21.0	3.0
FM02	FM3, 3A	21.1	1.43	2.21	3.64	22.8	2.5
FM03	FM3A	33.4	2.21	0.93	3.14	8.1	1.4
FM03A		8.4	0.25	0.44	0.69	62.7	2.8
FM04	FM6, 7, 9	20.6	0.43	1.28	1.71	36.7	4.0
FM05	FM7	37.8	1.07	1.32	2.39	11.2	2.2
FM06	FM7	9.7	0.31	0.73	1.04	66.2	3.4
FM07		17.9	0.85	2.15	3.01	37.4	3.5
FM08[c]	FM10, 10A, 11	7.8	0.25	1.07	1.33	126.5	5.2
FM09		16.5	0.36	1.15	1.52	47.9	4.2
FM10	FM10A, 11	14.7	0.62	2.07	2.68	56.2	4.4
FM10A		11.9	0.42	1.10	1.52	57.3	3.6
FM11		11.2	0.36	0.81	1.18	55.0	3.2
FM12		16.4	0.25	0.19	0.44	20.5	1.8

a. Peaking factor is the ratio of ADWF to Peak I/I Flow
b. This is incremental sewer length by flow meter basin (i.e., it does not include the length of sewers that are upstream of the tributary area).
c. Note the I/I rate is high for FM08, but the incremental sewer length is relatively small.

There are no I/I reduction projects recommended in this report. It would difficult to identify specific areas or pipe segments that contribute the highest amounts of I/I to the system without more extensive flow monitoring and field investigations. I/I issues are also often caused by infiltration or inflow from privately owned laterals. So, even if leaky City-owned pipes are repaired, a large source of I/I may remain. Therefore, while I/I reduction may reduce the need for capacity improvement projects, elimination of the need for any specific project cannot be assured. That said, the City should always look for ways to reduce I/I in the system through ongoing sewer rehabilitation efforts and encouraging property owners to maintain their sewer laterals in good condition. Should I/I flows appear to increase significantly in the future, the City may want to implement a targeted I/I investigation and correction program at that time.

APPENDICES

APPENDIX A – PUMP AND SYSTEM CURVES

PERFORMANCE CURVE

PRODUCT	TYPE
NP3202.090	MT

DATE	PROJECT	CURVE NO	ISSUE
2006-07-27	City Of Pleasanton PS-6	63-641-00-6040	4

	1/1-LOAD	3/4-LOAD	1/2-LOAD
POWER FACTOR	0.85	0.82	0.73
EFFICIENCY	89.5 %	90.0 %	89.5 %
MOTOR DATA	---	---	---

RATED POWER	45	hp
STARTING CURRENT ...	330	A
RATED CURRENT ...	55	A
RATED SPEED	1170	rpm
TOT.MOM.OF INERTIA ...	0.48	kgm2
NO. OF BLADES	2	

IMPELLER DIAMETER: 354 mm

MOTOR #	STATOR	REV
30-23-6AA	01D	12

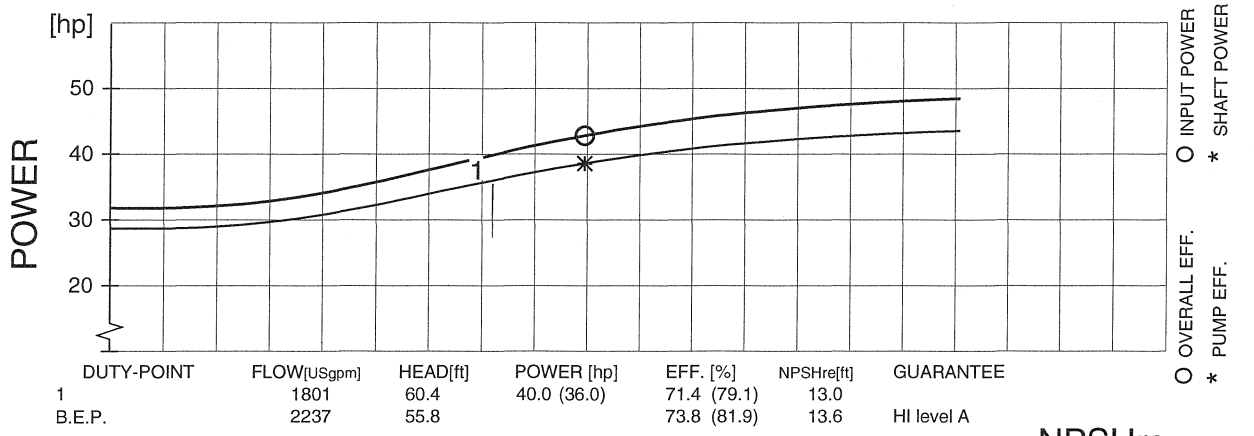
FREQ.	PHASES	VOLTAGE	POLES
60 Hz	3	460 V	6

GEARTYPE	RATIO
---	---

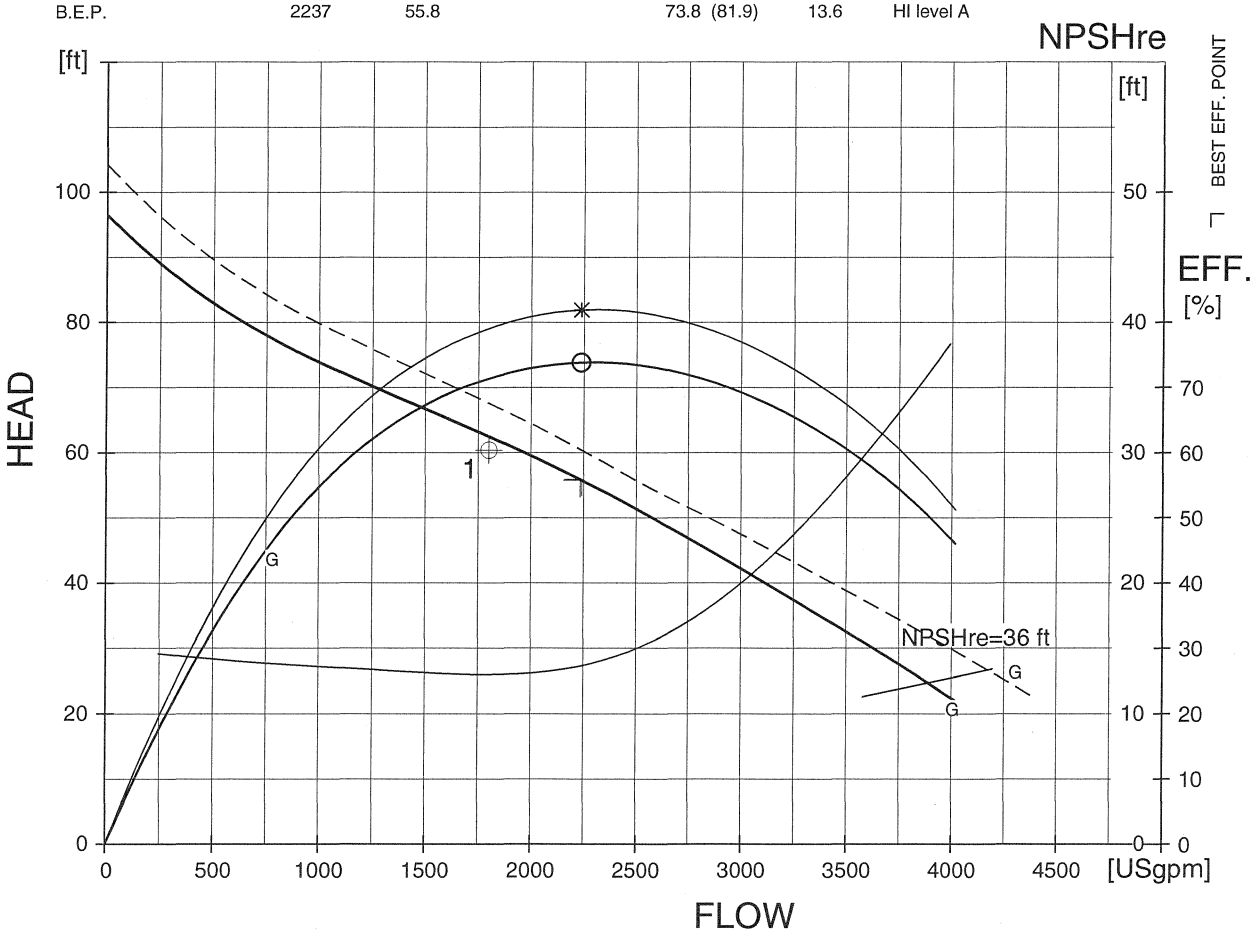
COMMENTS

INLET/OUTLET: -/ 8 inch

IMP. THROUGHLET: ---



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSHre[ft]	GUARANTEE
1	1801	60.4	40.0 (36.0)	71.4 (79.1)	13.0	
B.E.P.	2237	55.8		73.8 (81.9)	13.6	HI level A



NPSHre = NPSH3% + min. operational margin

Performance with clear water and ambient temp 40 °C

GUARANTEE BETWEEN LIMITS (G) ACC. TO

HI level A

GUARANTEE

FLYPS3.1.5.4 (20060324)

PERFORMANCE CURVE

PRODUCT	TYPE
NP3202.090	MT

DATE	PROJECT	CURVE NO	ISSUE
2006-07-27	City Of Pleasanton PS-6	63-641-00-6040	4

	1/1-LOAD	3/4-LOAD	1/2-LOAD
POWER FACTOR	0.85	0.82	0.73
EFFICIENCY	89.5 %	90.0 %	89.5 %
MOTOR DATA	---	---	---

RATED POWER	45	hp
STARTING CURRENT ...	330	A
RATED CURRENT ...	55	A
RATED SPEED	1170	rpm
TOT.MOM.OF INERTIA ...	0.48	kgm2
NO. OF BLADES	2	

IMPELLER DIAMETER: 354 mm

MOTOR #	STATOR	REV
30-23-6AA	01D	12

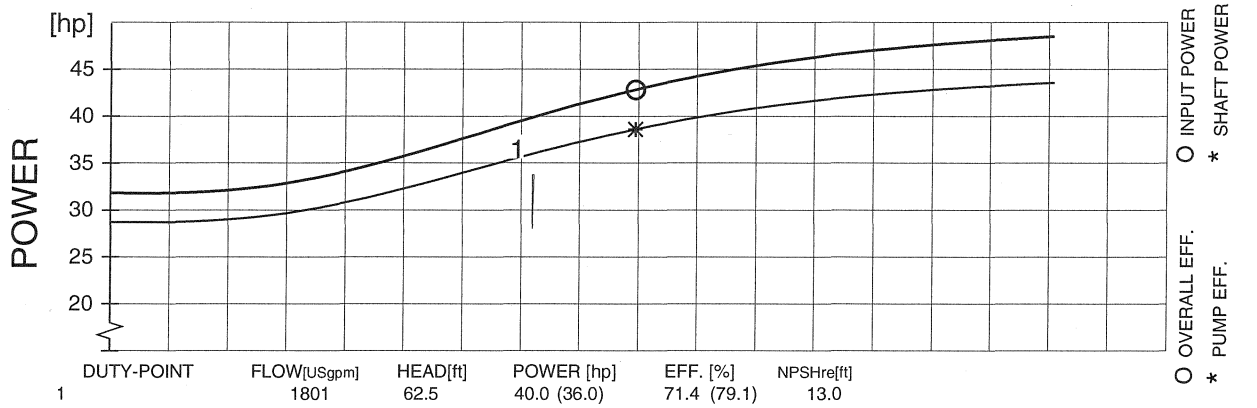
FREQ.	PHASES	VOLTAGE	POLES
60 Hz	3	460 V	6

GEARTYPE	RATIO
---	---

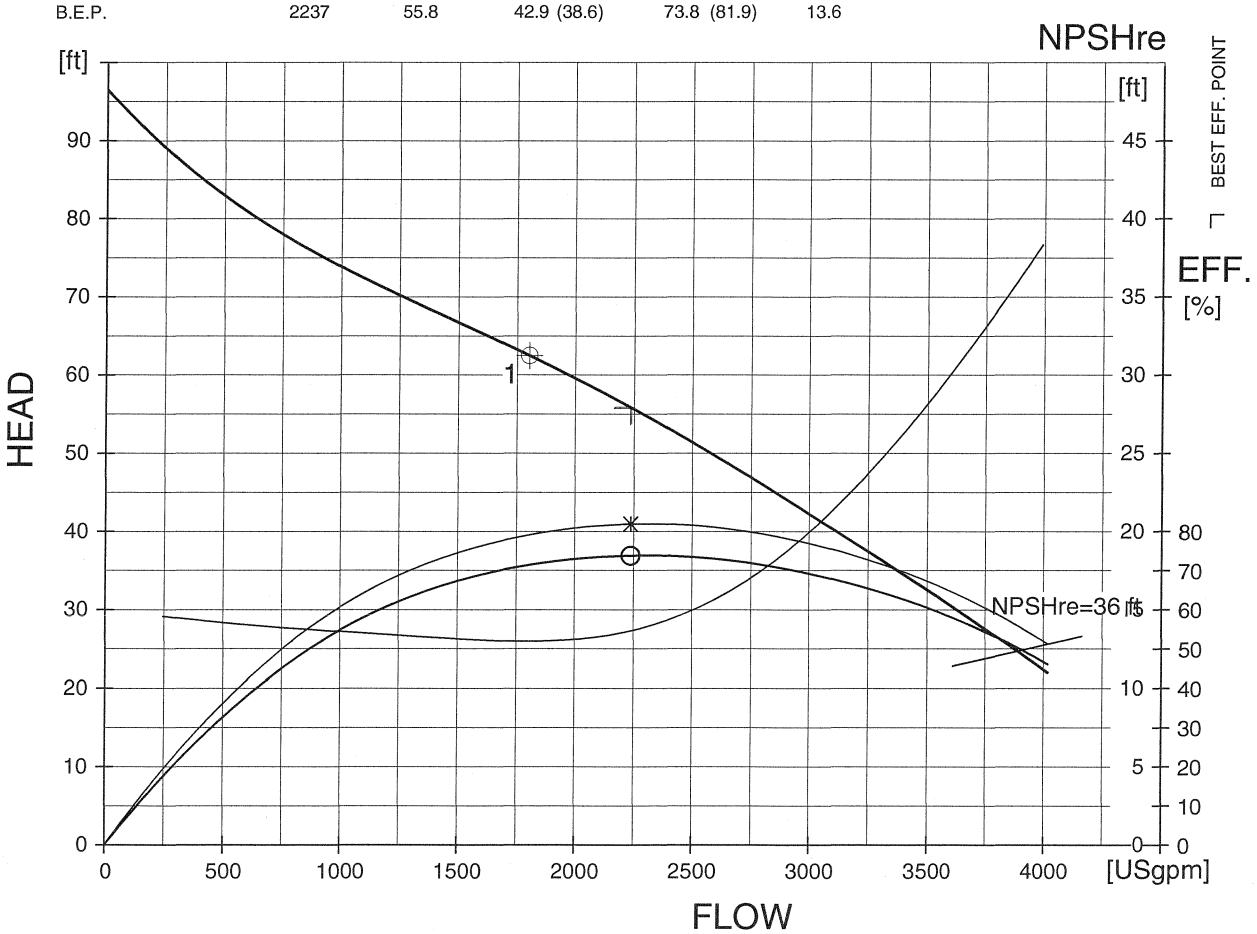
COMMENTS

INLET/OUTLET: -/ 8 inch

IMP. THROUGHLET: ---



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSHre[ft]
1	1801	62.5	40.0 (36.0)	71.4 (79.1)	13.0
B.E.P.	2237	55.8	42.9 (38.6)	73.8 (81.9)	13.6



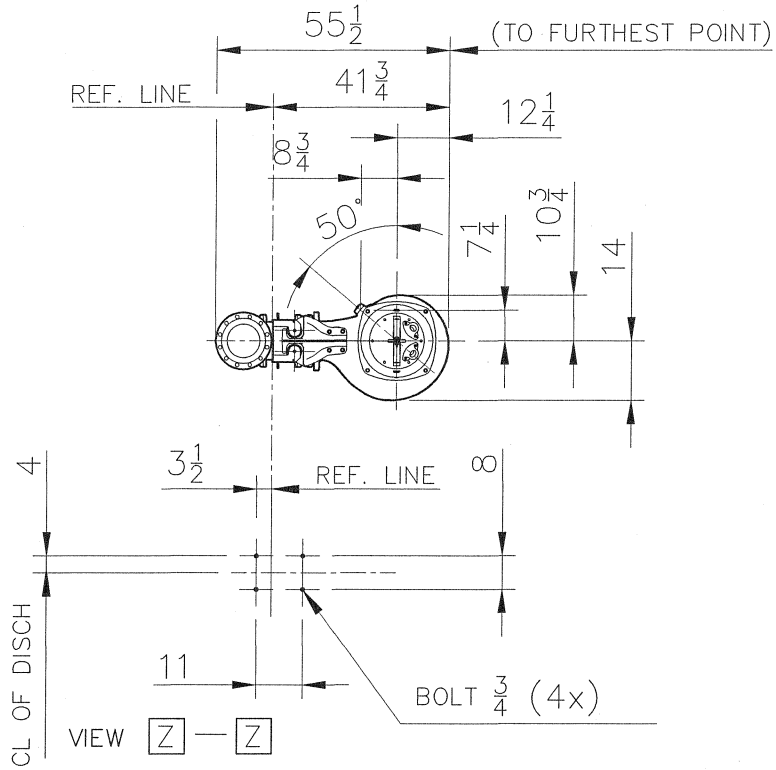
NPSHre = NPSH3% + min. operational margin

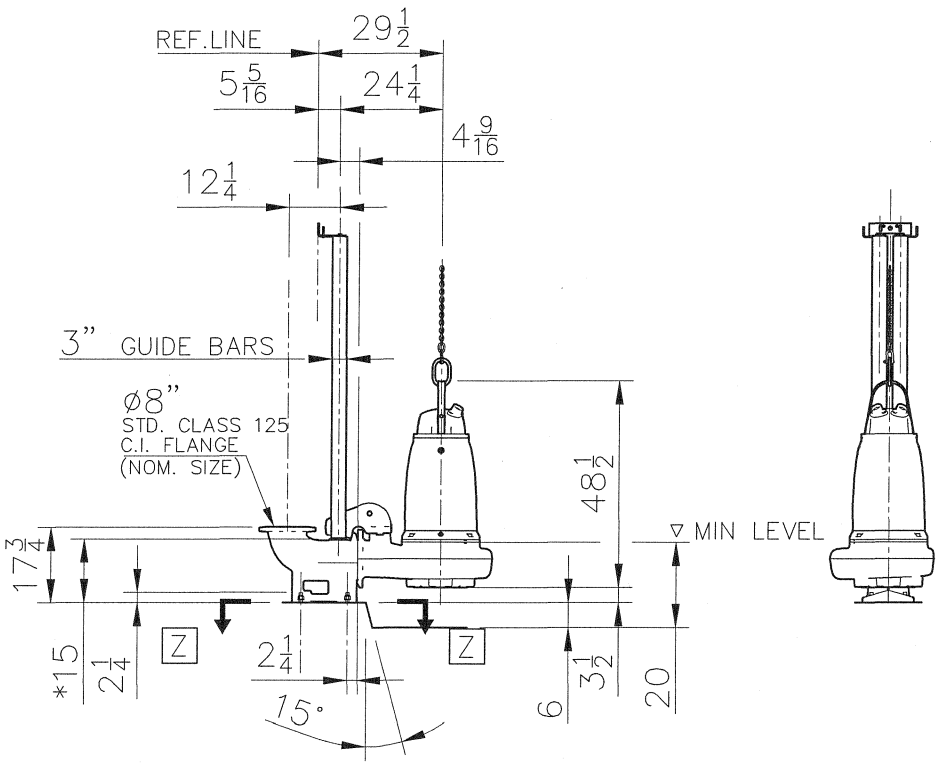
Performance with clear water and ambient temp 40 °C

HI B Curve

AVERAGE

FLYPS3.1.5.4 (20060324)

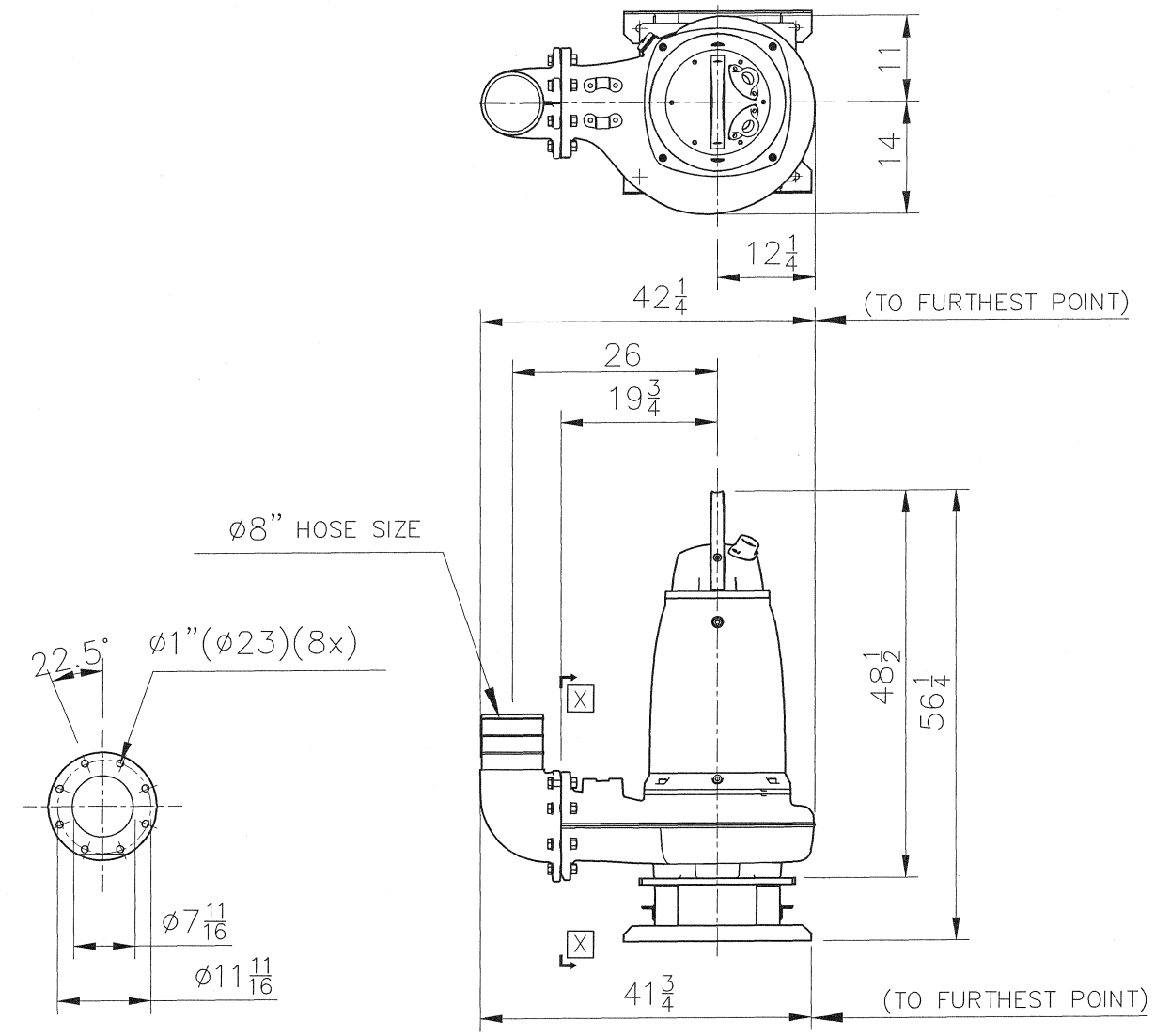




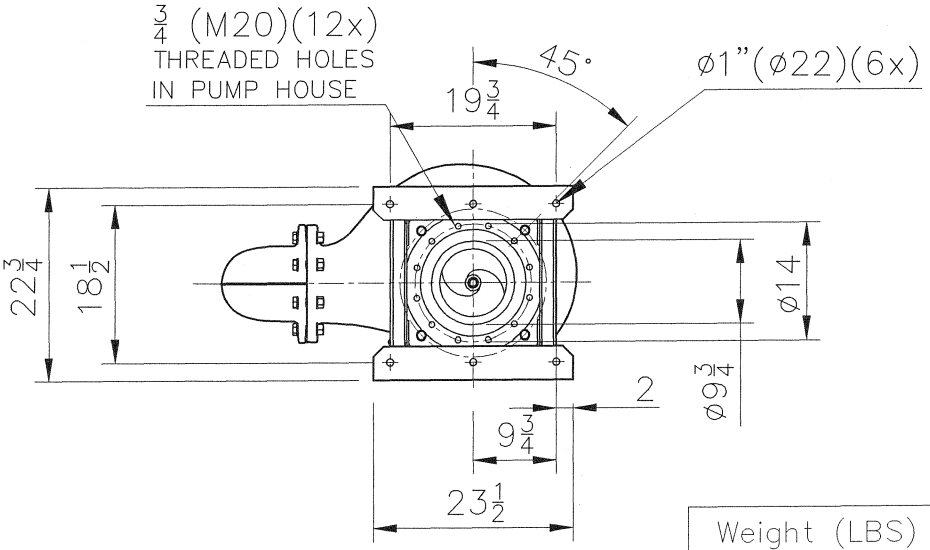
* DIMENSION TO ENDS OF GUIDE BARS

Weight (LBS)	
Pump with cooling jacket	Disch
1289	222
Pump without cooling jacket	
1178	

FLYGT AUTOCAD DRAWING	Denomination: Dimensional drwg NP 3202 MT 60HZ DN200/ DN200	Drawn by SZK	Checked by to	Date 010731
		Scale 1:40		Reg no 5399
		666 45 00		A



VIEW X – X



Weight (LBS)
Total incl. stand
1356

FLYGT AUTOCAD DRAWING	Denomination: Dimensional drwg NS 3202 MT 60HZ DN200/ dia200	Drawn by SZK	Checked by to	Date 010806
		Scale 1:20		Reg. no 5399
		666 47 00		B

CITY OF PLEASANTON
CALIFORNIA

SANITARY SEWER LIFT STATION
S-6 REPLACEMENT

PROJECT NO. 012027

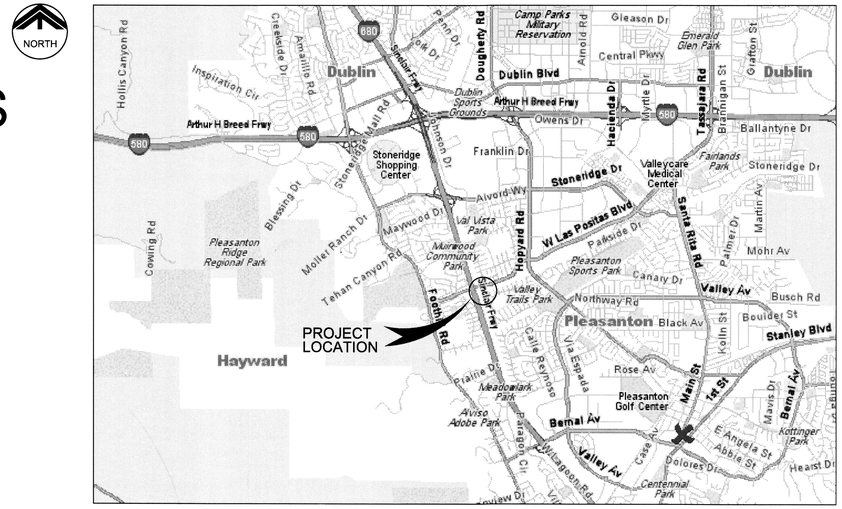
VOLUME 4 of 6
DRAWINGS

LOCATION MAP

CONFORMED DOCUMENTS
SEPTEMBER 2010

THE CITY OF
PLEASANTON

carollo



VICINITY MAP

The undersigned has approved this document for and on behalf of Carollo Engineers, P.C.

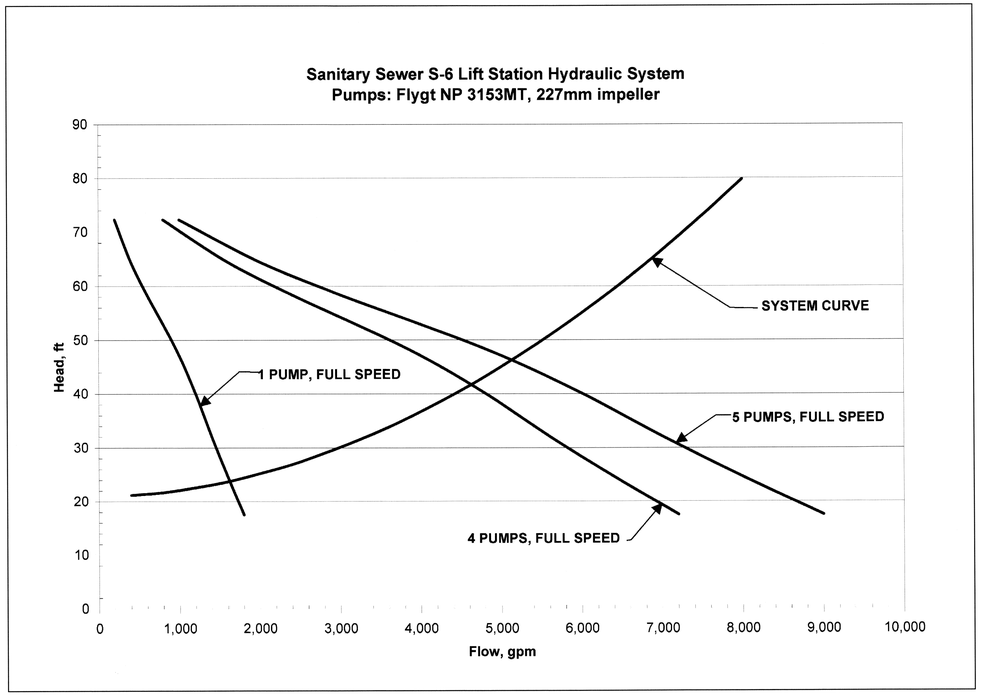
Partner

JOB NO.
7967A.10
DRAWING NO.
G-1
SHEET NO.
1 OF 45

Last Opened by: 3-22-09 03:39pm MGabel

FILENAME: Last Saved By: ${GETPROP}??

SHT NO.	DWG NO.	DESCRIPTION
		GENERAL
1	G - 1	Cover Sheet
2	G - 2	Sheet Index & Design Criteria
3	G - 3	General Structural and Architectural Notes
4	G - 4	Quality Assurance Plan
5	G - 5	Quality Assurance Plan
6	G - 6	Quality Assurance Plan
7	G - 7	Quality Assurance Plan
8	G - 8	Staging and Access Plan
		Typicals
9	T - 1	General - 1
10	T - 2	General - 2
11	T - 3	General - 3
		Demolition
12	D - 1	Site Plan
		Civil
13	C - 1	Site Plan - Yard Piping
14	C - 2	Site Plan - Paving & Grading
15	C - 3	Site Details
		Architectural
16	A - 1	MCC Building Elevations
17	A - 2	Door & Window Schedule & Details
		Structural/Mechanical
18	S/M - 1	MCC Building - Ground Level Plan & Roof Plan
19	S/M - 2	MCC Building - Sections and Details
20	S/M - 3	Pump Station - Bottom Plan
21	S/M - 4	Pump Station - Top Plan and Section
22	S/M - 5	Pump Station - Sections
23	S/M - 6	Pump Station - Sections
24	S/M - 7	Pump Station - Details
		Plumbing
25	P - 1	MCC Building Plumbing Plan
		Electrical
26	GE - 1	Electrical Symbol Legend
27	GE - 2	Electrical Abbreviations
28	E - 1	Site Power Plan
29	E - 2	Luminaire and Panelboard Schedule
30	E - 3	MCC and Switchboard One Line Diagram
31	E - 4	MCC and Switchboard Elevations
32	E - 5	Pump Station Power and Control Plan
33	E - 6	MCC Building Power Plan
34	E - 7	MCC Building Lighting and Grounding Plan
		Instrumentation
35	GN - 1	Symbols and Legend I
36	GN - 2	Symbols and Legend II
37	GN - 3	System Block Diagram
38	GN - 4	Typical Loop Diagrams/Control Panel Power Diagram
39	GN - 5	PLC Panel Elevation
40	GN - 6	Control Schematics
41	GN - 7	Control Schematics
42	N - 1	Pump Station Pumps 1 & 2
43	N - 2	Pump Station Pumps 3 & 4
44	N - 3	Pump Station Pump 5 & 6
45	N - 4	Standby Generator and Misc. Alarms



DESIGN CRITERIA

PUMP STATION LOCATION	6900 W. LAS POSITAS BLVD
TYPE	SUBMERSIBLE TRENCH-STYLE (5 PUMPS)
CAPACITY	
RELIABLE	6.6 MGD @ 42' TDH
TOTAL	7.6 MGD @ 45' TDH
LEVEL CONTROL TYPE	ULTRASONIC LEVEL W/ FLOAT BACKUP
OVERFLOW POINT	
OVERFLOW DISCHARGE	ARROYO MOCHO CANAL
AVERAGE TIME TO OVERFLOW	
AUXILIARY POWER TYPE	STATIONARY DIESEL GENERATOR
OUTPUT	200 Kw
FUEL TANK CAPACITY	300 GALLONS
TRANSFER SWITCH	AUTOMATIC
ALARM TELEMETRY TYPE	RADIO
EPA RELIABILITY CLASS	I
FORCE MAIN LENGTH, TYPE	2,750' OF 20" PVC
PROFILE	GENERALLY ASCENDING EXCEPT FOR CROSSING UNDER CHANNEL "G"
DISCHARGE LOCATION	DUBLIN SAN RAMON SERVICES DISTRICT (DSRSD) WASTEWATER TREATMENT PLANT
AIR RELEASE VALVES	ONE AT HIGH POINT PRIOR TO CHANNEL "G"
AVERAGE DETENTION	37 MIN @ 1,200 GPM

DATE: $TIME$

LAST SAVED BY: tjones

CONFORMED DOCUMENTS FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

DESIGNED BMC
DRAWN MJG/EDL
CHECKED TPY
DATE SEPT 2010

ORIGINAL STAMPED BY TODD PHILLIP YAMELLO 06/30/12 C69274

carollo

THE CITY OF PLEASANTON

CITY OF PLEASANTON
SANITARY SEWER LIFT STATION S-6 REPLACEMENT
GENERAL
SHEET INDEX, ABBREVIATIONS & DESIGN CRITERIA

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 7967A.10
DRAWING NO. G-2
SHEET NO. 2 OF 45

PROJECT NO.
FILE NAME: _title_blks.CEL

Sewer Department Pump and Motor Assembly Inventory

11-Feb-02 Pump Station Number S7 Pump Number 1

Motor

Equipment IDNumber LSS07MOT1

Manufacturer GE HP 20 Volts 230/460 Amps 55.2/27.

Model # 5K6235XM39A Final Connection 460 Volts RPM 1165

Serial # FRJ613283 Service Factor 1.15 Type K Insul CL

Catalog # Code G Phase 3 Frame C286HP

Lower Bearing 629A310 Upper Bearing K598349 Shaft

Pump/Motor Combo No Ambient Temp 40 C

Remarks

Pump

Equipment ID Number LSS07PMP1

Make Fairbanks Morse/Colt Industries Capacity (GPM) 1400 TDH 33 feet

Model/Stock # B5444 Impeller Number 11.0 (si Size 8x10

Serial # K3D1087161-2 Material Volute diam

Catalog # Column Suction diam

Pump/Motor Combo No Stages 1 Casting Nozzle (Disch diam)

Remarks Frame: T40

PUMP SUCTION PIPING ELEVATION 299'

FORCE MAIN DISCHARGE ELEVATION 319'

Sewer Department Pump and Motor Assembly Inventory

11-Feb-02 Pump Station Number S7 Pump Number 2

Motor

Equipment IDNumber LSS07MOT2

Manufacturer GE HP 20 Volts 230/460 Amps 55.2/27.

Model # 5K6235XM39A Final Connection 460 Volts RPM 1165

Serial # FRJ613281 Service Factor 1.15 Type K Insul CL

Catalog # Code G Phase 3 Frame C286HP

Lower Bearing 629A310 Upper Bearing K598349 Shaft

Pump/Motor Combo No Ambient Temp 40 C

Remarks

Pump

Equipment ID Number LSS07PMP2

Make Fairbanks Morse/Colt Industries Capacity (GPM) 1400 TDH 33 feet

Model/Stock # B5444 Impeller Number 11.0 (si Size 8x10

Serial # K3D1087161-3 Material Volute diam

Catalog # Column Suction diam

Pump/Motor Combo No Stages 1 Casting Nozzle (Disch diam)

Remarks Frame: T40

Sewer Department Pump and Motor Assembly Inventory

11-Feb-02 Pump Station Number S7 Pump Number 3

Motor

Equipment IDNumber LSS07MOT3

Manufacturer GE HP 20 Volts 230/460 Amps 55.2/27.

Model # 5K6235XM39A Final Connection 460 Volts RPM 1165

Serial # FRJ613282 Service Factor 1.15 Type K Insul CL

Catalog # Code G Phase 3 Frame C286HP

Lower Bearing 629A310 Upper Bearing K598349 Shaft

Pump/Motor Combo No Ambient Temp 40 C

Remarks

Pump

Equipment ID Number LSS07PMP3

Make Fairbanks Morse/Colt Industries Capacity (GPM) 1400 TDH 33 feet

Model/Stock # B5444 Impeller Number 11.0 (si Size 8x10

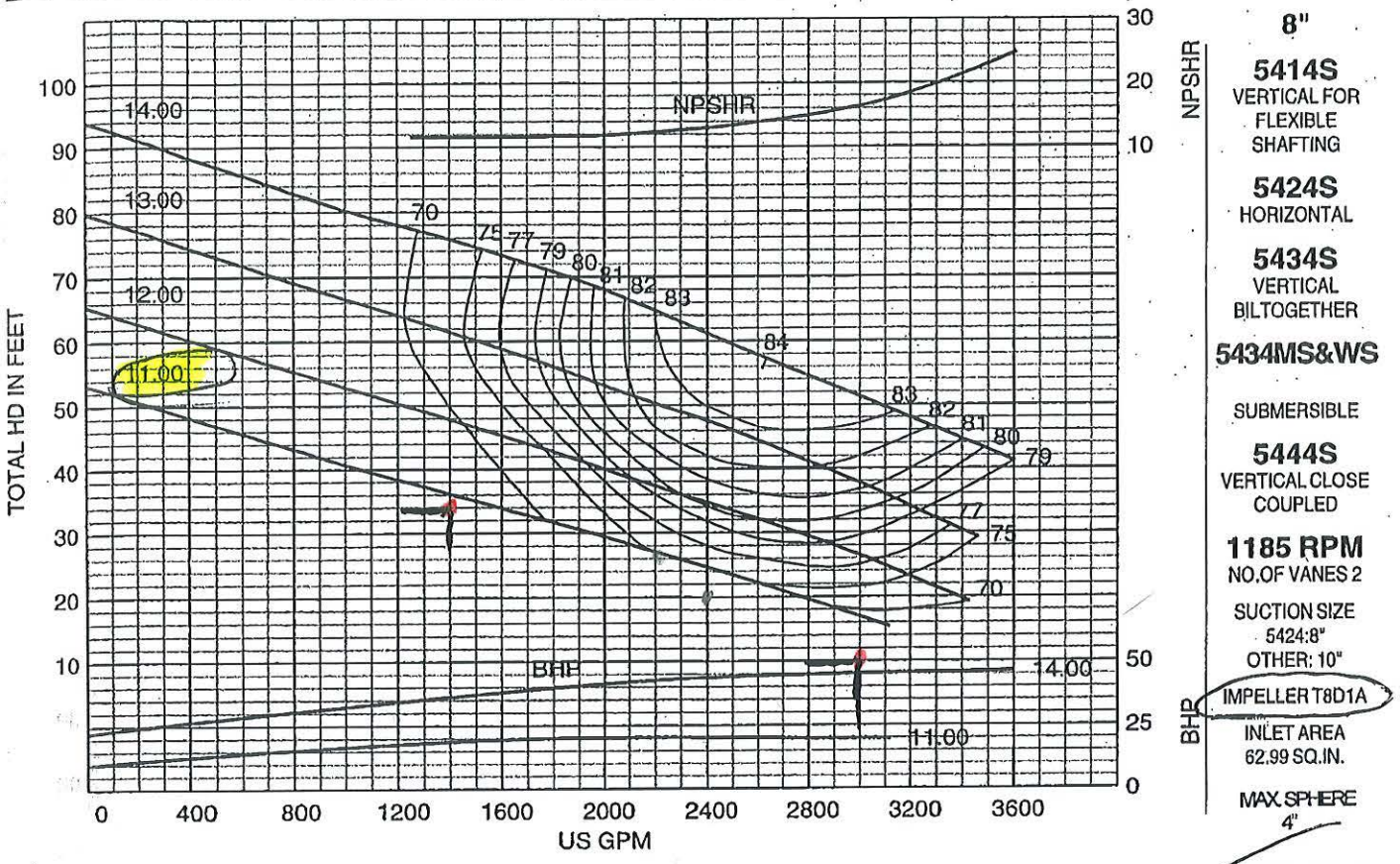
Serial # K3D1087161-1 Material Volute diam

Catalog # Column Suction diam

Pump/Motor Combo No Stages 1 Casting Nozzle (Disch diam)

Remarks Frame: T40

5-7 STATION



8"

5414S
VERTICAL FOR FLEXIBLE SHAFTING

5424S
HORIZONTAL

5434S
VERTICAL BILTOGETHER

5434MS&WS
SUBMERSIBLE

5444S
VERTICAL CLOSE COUPLED

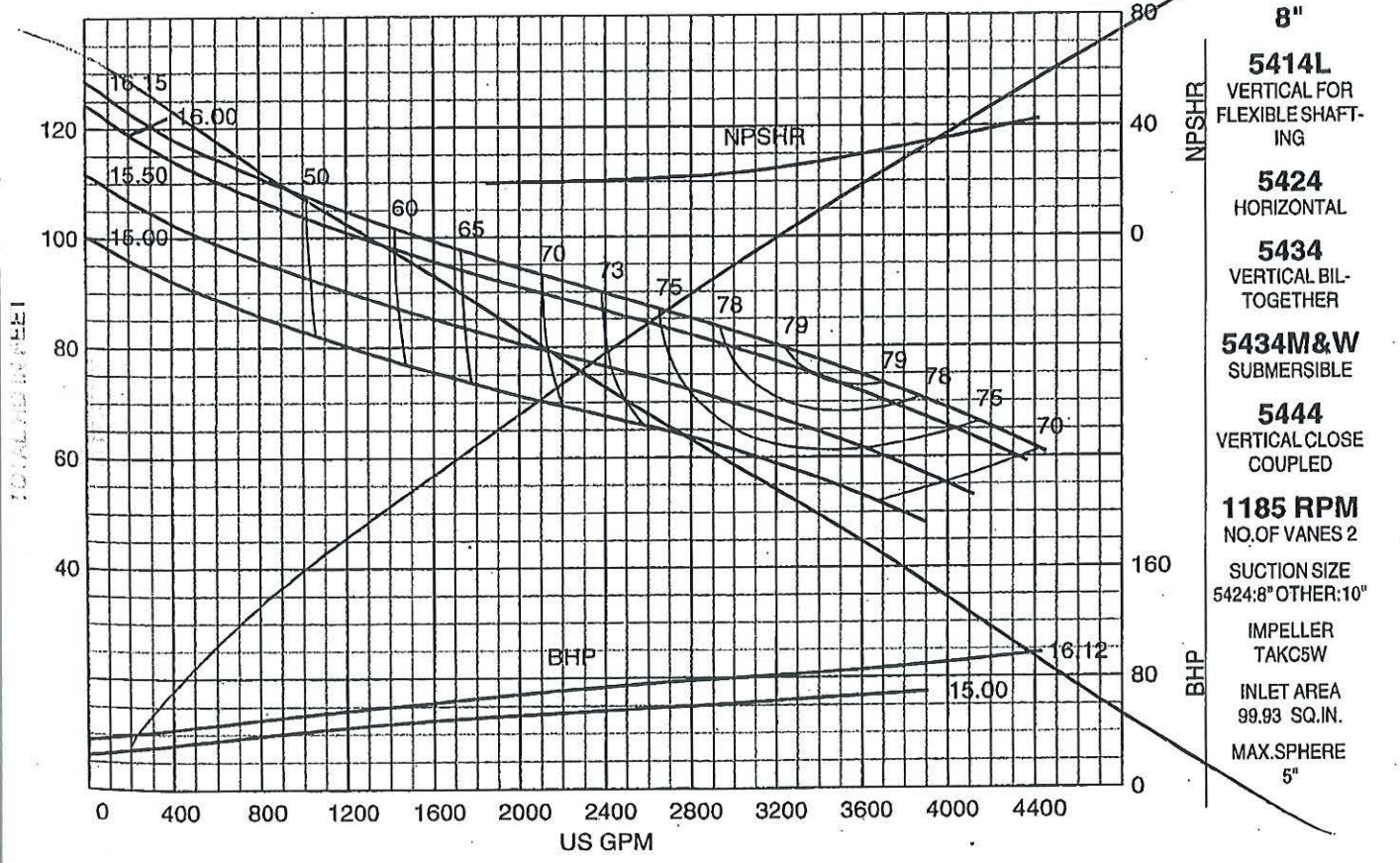
1185 RPM
NO.OF VANES 2

SUCTION SIZE
5424:8"
OTHER: 10"

IMPELLER T8D1A

INLET AREA
62.99 SQ.IN.

MAX.SPHERE
4"



8"

5414L
VERTICAL FOR FLEXIBLE SHAFTING

5424
HORIZONTAL

5434
VERTICAL BILTOGETHER

5434M&W
SUBMERSIBLE

5444
VERTICAL CLOSE COUPLED

1185 RPM
NO.OF VANES 2

SUCTION SIZE
5424:8" OTHER:10"

IMPELLER
TAKC5W

INLET AREA
99.93 SQ.IN.

MAX.SPHERE
5"

PUMP REPAIR SERVICE CO.

May 13, 2009

City of Pleasanton
3333 Busch Road
P. O. Box 520
Pleasanton, CA 94566-0802

Attn: Jeff Ballou

SUBJECT: STATION S7

Dear Jeff,

These pumps were sold in 1979 with two design conditions 1400 GPM @ 33' TDH and 3000 GPM @ 10' TDH with a pump shut off head at 53' TDH. After test running the three **Fairbank Morse** sewage pumps, we found the following. Unfortunately, without the flow meter working during these tests there was no way to get the pumping capacities.

#1 Pump running at 1165 RPM
Discharge 10 PSI = 23.00 TDH
Suction 3 PSI = 6.93 TDH
Total Pump Head 16.07
Pump Shut Off Head 19 PSI – 43.89

#2 Pump running at 1165 RPM
Discharge 7 PSI = 16.17 TDH
Suction 3 PSI = 6.93 TDH
Total Pump Head 9.24
Pump Shut Off Head 17 PSI = 39.27

I believe this pump may have some debris caught in the eye of the impeller.

#3 Pump running at 1165 RPM
Discharge 10 PSI = 13.86
Suction 3 PSI = 6.93
Total Pump Head 16.07
Pump Shut Off Head 19 PSI = 43.89

ESTABLISHED 1941
PO BOX 34327 SAN FRANCISCO, CA 94134-0327 415.467.2150 FAX 415.467.7442

Sewer Department Pump and Motor Assembly Inventory

11-Feb-02 **Pump Station Number** S8 **Pump Number** 1, 2, 3

Motor

Equipment IDNumber LSS08MOT1

Manufacturer GE **HP** 60 **Volts** 230/460 **Amps** 147/73

Model # 5K404AL352M **Final Connection** 460 Volts **RPM** 1180

Serial # GR302022 **Service Factor** 1.15 **Type** K **Insul CL**

Catalog # **Code** G **Phase** 3 **Frame** 404 TS

Lower Bearing 65BC02J **Upper Bearing** 65BC02J **Shaft**

Pump/Motor Combo No **Ambient Temp**

Remarks

Pump

Equipment ID Number LSS08PMP1

Make Fairbanks Morse/Colt Industries **Capacity (GPM)** 1400 **TDH** 80

Model/Stock # B5424 **Impeller Number** **Size** 15 inch

Serial # K3D1087160-3 **Material** **Volute diam**

Catalog # **Column** **Suction diam**

Pump/Motor Combo No **Stages** 1 **Casting** **Nozzle (Disch diam)**

Remarks Frame T40; 8"

Colt Industries Pump Division

cc: Phil Bouldin
Mile Neal

5-8 STATION

FACTORY PUMP SPECIFICATIONS AND BILL OF MATERIAL

DATE ENTERED	DATE PROMISED	DATE SHIPPED	MOTOR S/N	PUMP SERIAL NO.
2-15-79	309			K3D1-087160

CUSTOMER'S NAME: Elmer FREETHY CO
CUSTOMER P.O.: 1906-78-24 K3D1-087160-1 K3D1-087160-2
BUILD 3 PUMPS ON THIS ORDER AND NO OTHER PUMPS ON THIS ORDER
SPEC. WRITER: L. Bilenga CHECKED:

PUMP DESCRIPTION		GENERAL	OPERATING CONDITIONS		
SIZE 8"	DIS. POS. # 7	SUCTION PROJ.	GPM 1400/3000	TDH 80/50 (35/21)	CERTIFIED CURVES * YES NO
FIGURE NO. B5424		DISCH. PROJ.	SUCTION LIFT / SUCTION HEAD		CURVES APPR'D. BEFORE SHPM'T. YES NO
PUMP SETTING IF	ROTATION CW	TUBE PROJ.	PUMP RPM 1160 (F/L)	MTR. S.F. 1.15	WITNESS TEST YES NO
CURVE NO. K3D1-087160	GUARANTEE YES (NO)	SUCTION SIZE	MTR. HP 60	MTR. TYPE Horiz-OLP	HYDRO TEST PSI-70 YES NO
SHIP ASSEMBLED YES NO		DISCH. SIZE 8"	IMPELLER T8D1CR	DIA. OR "A" DIM. 15.00"	DATE PUMP TESTED
DRIVER MOUNTED BY FACTORY - [redacted]		MIN. END PLAY	SOLID OVERLOAD YES NO	SP GRAVITY	TESTED BY

SPECIAL INSTRUCTIONS

Pump w/ brz glands & 450 BHN sleeve
Motor: 993X087160 9906 F
GE 60HP @ 1200 RPM 3/60/460V w/ Thermisters FR-404T
Dynamic Balance Impellers
& Ret: T8D1D
* Test 1-Pump Only

Sub C/P

SETTING PLAN

SPECIAL AND VARIABLE PARTS ON THIS ORDER

QUANTITY	SYMBOL	MATERIAL	LEVEL CODE	PRODUCT CODE	DESCRIPTION	REFERENCE	LINE

PAGE 1 OF 6

5-8 STATION

8"

5414L
VERTICAL FOR FLEXIBLE SHAFTING

5424L
HORIZONTAL

5434L
VERTICAL BILTOGETHER

5434ML&WL
SUBMERSIBLE

5444L
VERTICAL CLOSE COUPLED

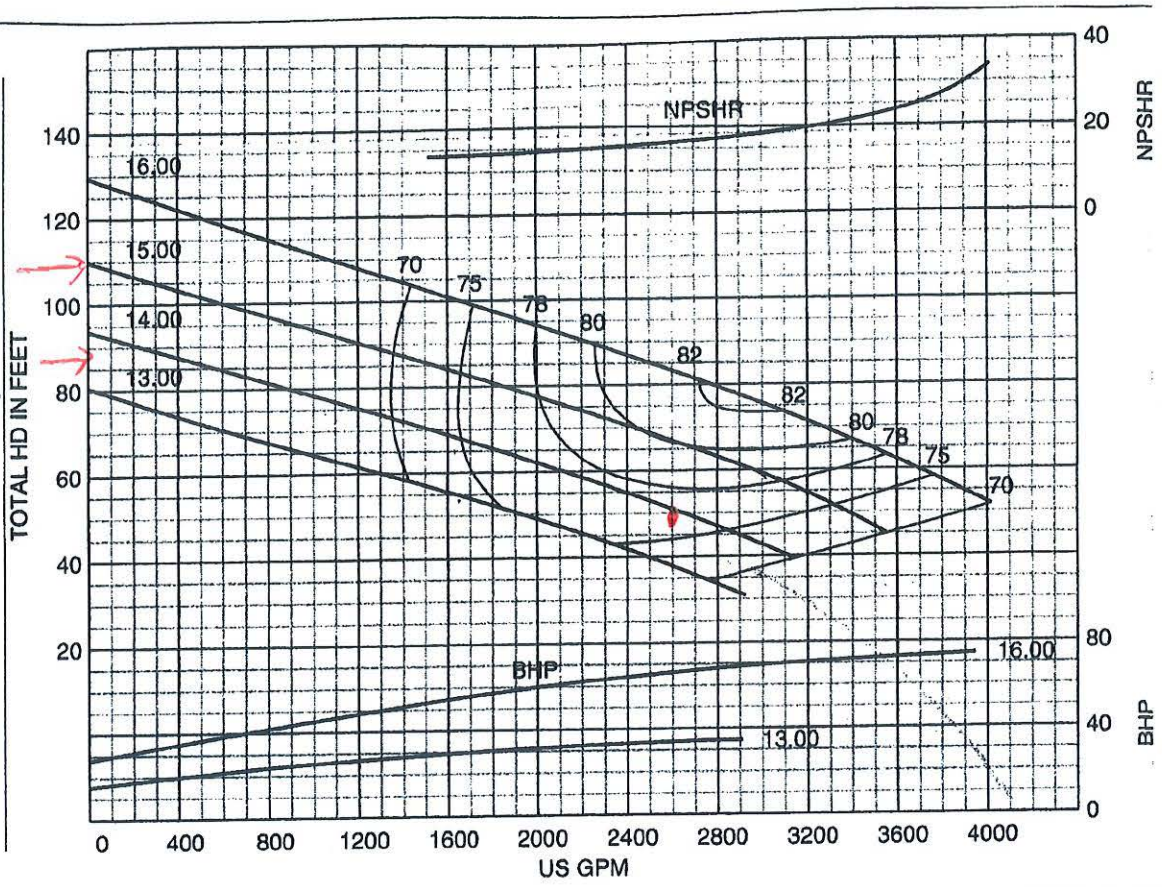
1185 RPM
NO.OF VANES 2

SUCTION SIZE
5424:8"
OTHER: 10"

IMPELLER T8D1D

INLET AREA
72.94 SQ.IN.

MAX.SPHERE 4"



15 OD impellers ORiginal Trim

13½ OD impellers new Trim

Future
M40806?

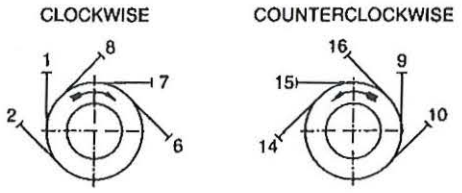
⚠ WARNING

DO NOT OPERATE THIS MACHINE WITHOUT PROTECTIVE GUARD IN PLACE ANY OPERATION OF THIS MACHINE WITHOUT PROTECTIVE GUARD CAN RESULT IN SEVERE BODILY INJURY.

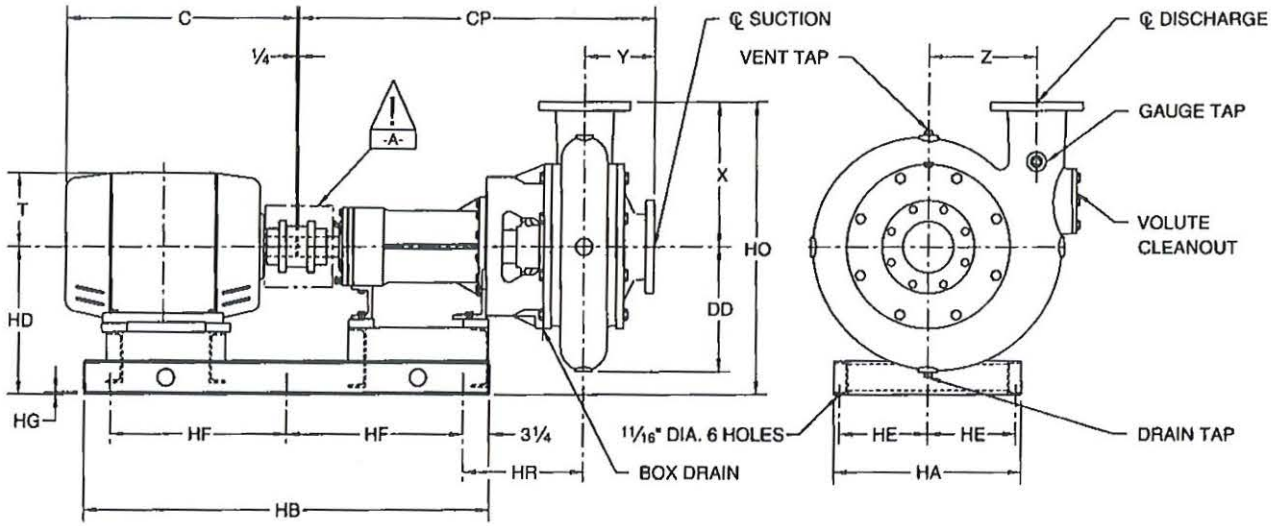
-A- SUPPLIED BY FMPC -B- SUPPLIED BY OTHERS

MOTOR DIMENSIONS	
C	T

AVAILABLE DISCHARGE POSITIONS



POSITIONS #1 OR #9 ARE STANDARD WHEN VIEWED FROM THE DRIVER END UNLESS OTHERWISE SPECIFIED CLOCKWISE ROTATION DISCHARGE POSITION #1 SHOWN



Design Conditions: 2500 GPM @ 50' TDH.

PUMP	FRAME		SUCT	DISCH	X	Y	Z	CP	DD	HA	HB	HD	HE	HF	HG	HO	HR
	PUMP	MOTOR															
6" B5424	T40	143T-184T	6	6	17	8⅜	12 13/16	42⅜	15½	22¼	36½	17½	10½	15	¼	34½	14¼
6" B5424	T40	213T-254T	6	6	17	8⅜	12 13/16	42⅜	15½	22¼	42½	17½	10½	18	¼	34½	14¼
6" B5424	T40	256T-364TS	6	6	17	8⅜	12 13/16	42⅜	15½	22¼	48½	17½	10½	21	¼	34½	14¼
6" B5424	T40	365T-404TS	6	6	17	8⅜	12 13/16	42⅜	15½	30½	54½	17½	14½	24	5/16	34½	14¼
8" B5424S(3)	T40	254T	8	8	16	9⅛	10 13/16	43⅝	14⅛	22¼	42½	19	10½	18	¼	35	14¾
8" B5424S(3)	T40	256T-364TS	8	8	16	9⅛	10 3/16	43⅝	14⅛	22¼	48½	19	10½	21	¼	35	14¾
8" B5424L(4)	T40	256T-364TS	8	8	18	9⅛	14	43⅝	17	22¼	48½	19	10½	21	¼	37	14¾
8" B5424L(4)	T40	365T-404TS	8	8	18	9⅛	14	43⅝	17	30½	54½	19	14½	24	5/16	37	14¾

NOTES.

(1) ALL FLANGES ARE 125# ANSI DRILLING UNLESS NOTED
(2) ALL DIMENSIONS ARE IN INCHES UNLESS NOTED.
(3) FOR USE WITH IMPELLER DESIGN T8D1A.
(4) FOR USE WITH IMPELLER DESIGNS T8D1D OR TAKC5W
(5) 5400'S AND 5400K'S ARE DIMENSIONALLY IDENTICAL.
(6) BASES ARE DESIGNED TO BE COMPLETELY FILLED WITH GROUT.
(7) SUCTION GAUGE CONNECTIONS ARE NOT AVAILABLE AND SHOULD BE LOCATED ON ADJACENT SUCTION PIPING.
(8) NOT FOR CONSTRUCTION, INSTALLATION, OR APPLICATION PURPOSES UNLESS CERTIFIED. DIMENSIONS SHOWN MAY VARY DUE TO NORMAL MANUFACTURING TOLERANCES.

CUSTOMER: City of Pleasanton					P O NO	
JOB NAME: STATION: 58 Pump #2					TAG NAME	
PUMP SIZE AND MODEL		GPM	TDH	RPM	ROTATION	DISCH POS
MOTOR	HP	FRAME	PHASE	HERTZ	VOLTS	ENCLOSURE
CERTIFIED FOR			CERTIFIED BY		DATE	

Fairbanks Morse Pump Corporation

SETTING PLAN
6" & 8" B5424
WITH STRUCTURAL BASE

DWG NO 5420S029 REV NO 0

Sanitary Sewer Station S-8

Pump Flow & Pressure Test Results

Static Discharge Pressure (all pumps off) was **14 PSI** with 7.7 ft. in Wet Well 3

Pump	Flow/GPM	PSI
# 1	2440	24 PSI
# 2	2300	22 PSI
# 3	2350	24 PSI
# 1 & # 2	3790	34 PSI
# 1, 2 & 3	3800	36 PSI

55 52

2500 GPM @ 50'

Pressures below were with pump running against closed discharge valve.

# 1	0	50 PSI
# 2	0	47 PSI
# 3	0	45 PSI

APPENDIX B – PLOTS OF FLOW MONITORING DATA

Figure B-1: Meter 1 Flow Monitoring Depth and Flow Plot

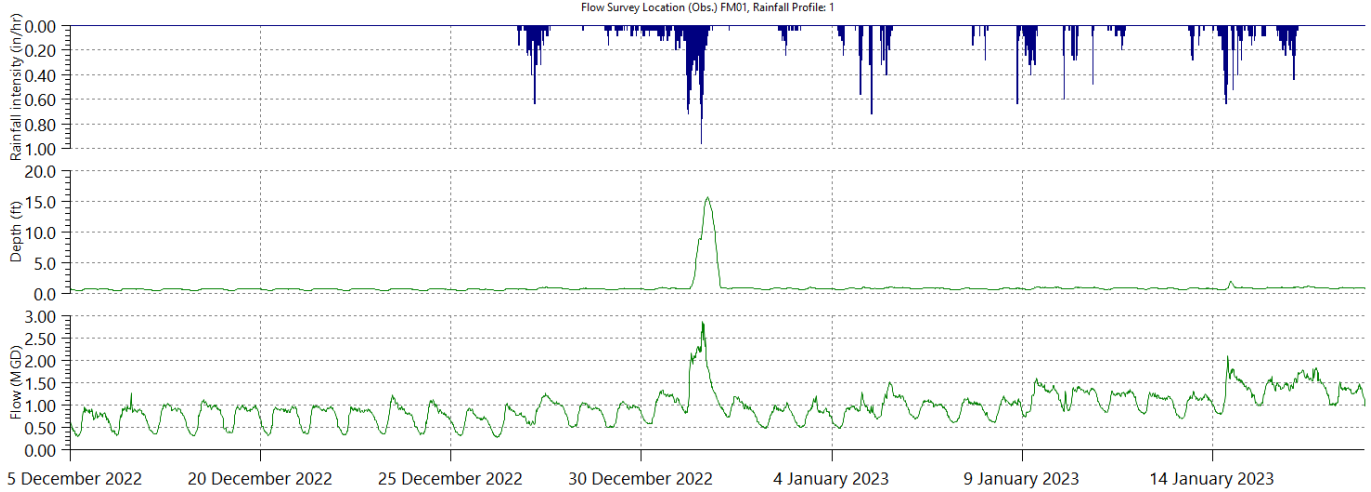


Figure B-2 Meter 2 Flow Monitoring Depth and Flow Plot

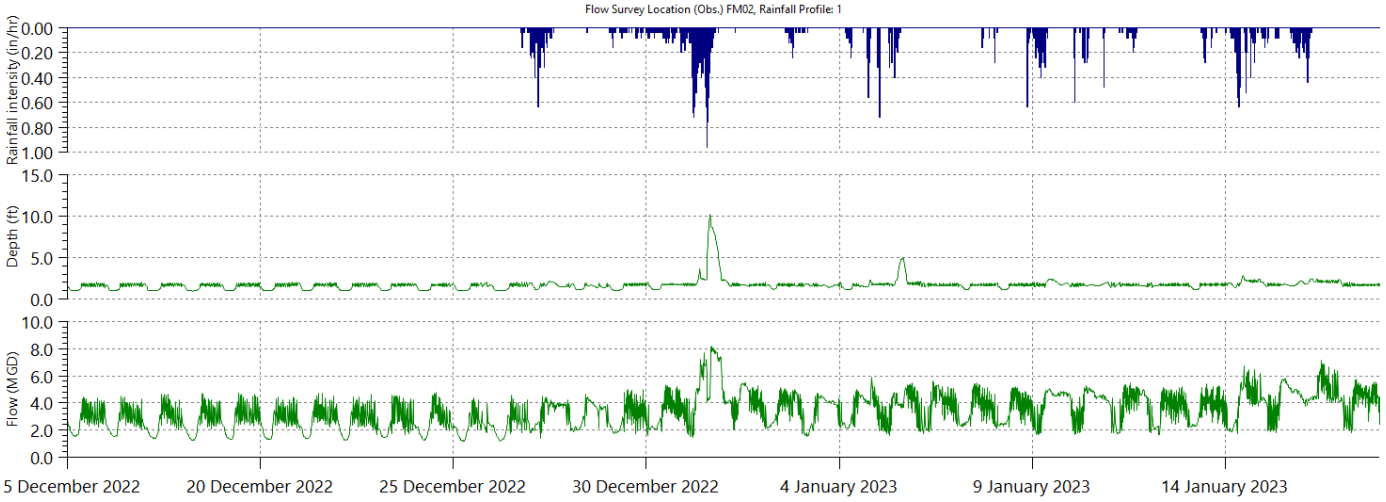


Figure B-3: Meter 3 Flow Monitoring Depth and Flow Plot

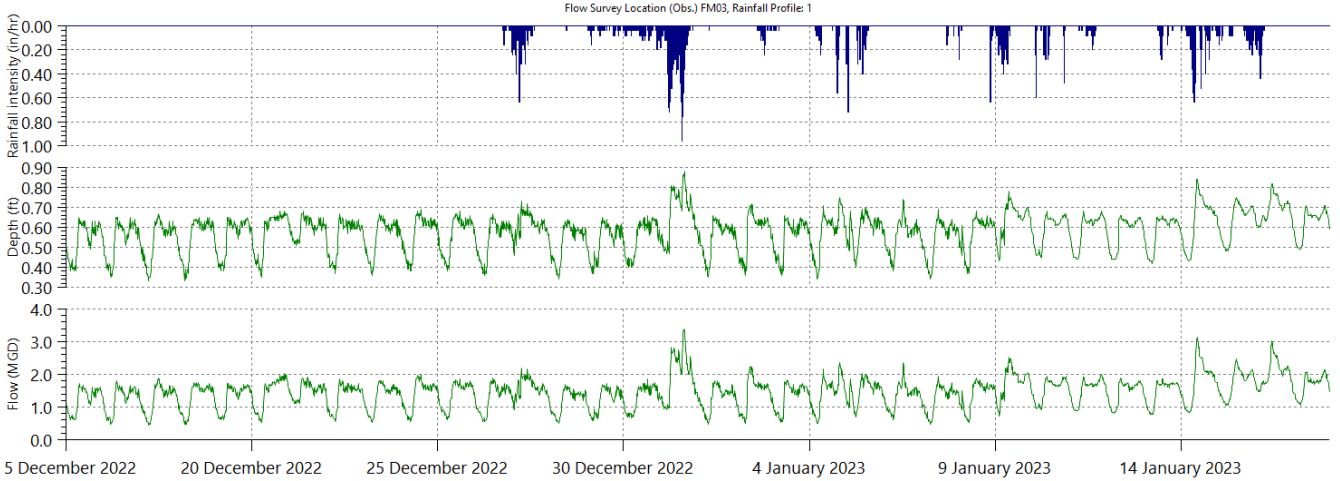


Figure B-4: Meter 3A Flow Monitoring Depth and Flow Plot

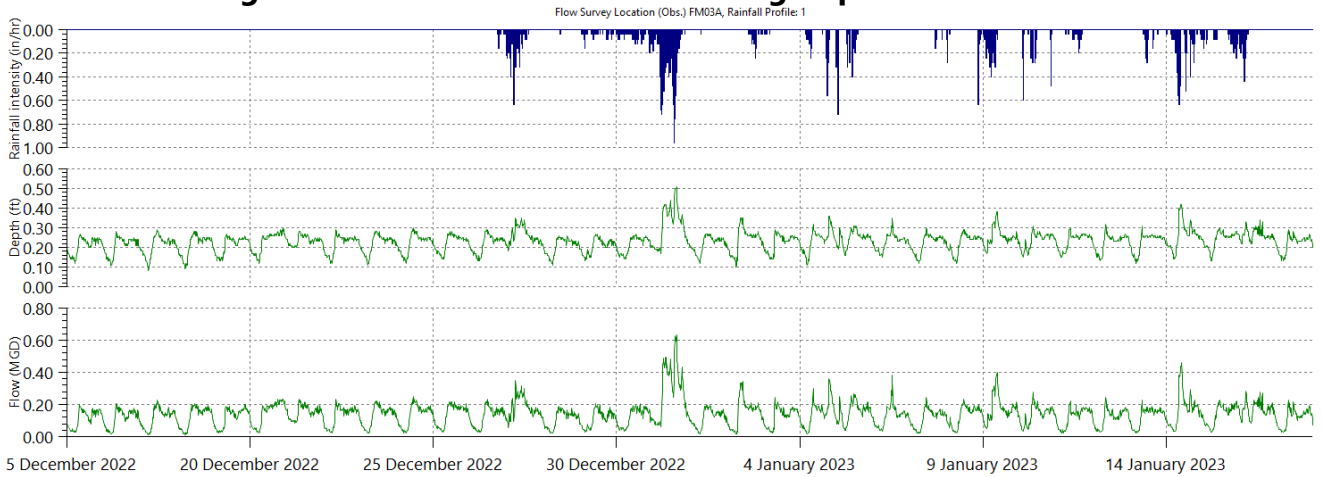


Figure B-5 Meter 4 Flow Monitoring Depth and Flow Plot

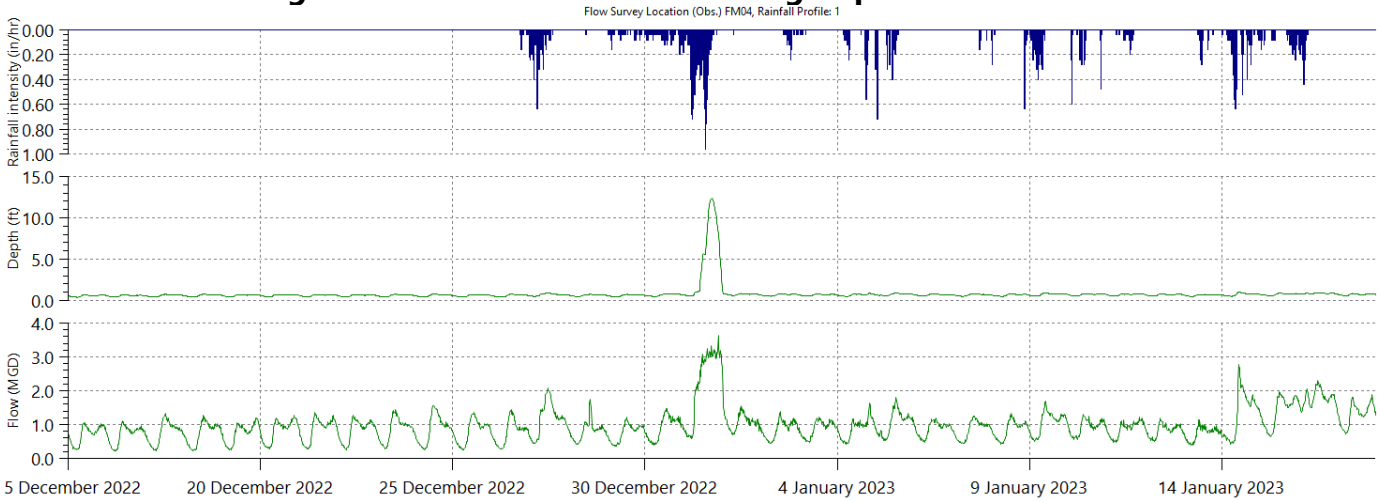


Figure B-6: Meter 5 Flow Monitoring Depth and Flow Plot

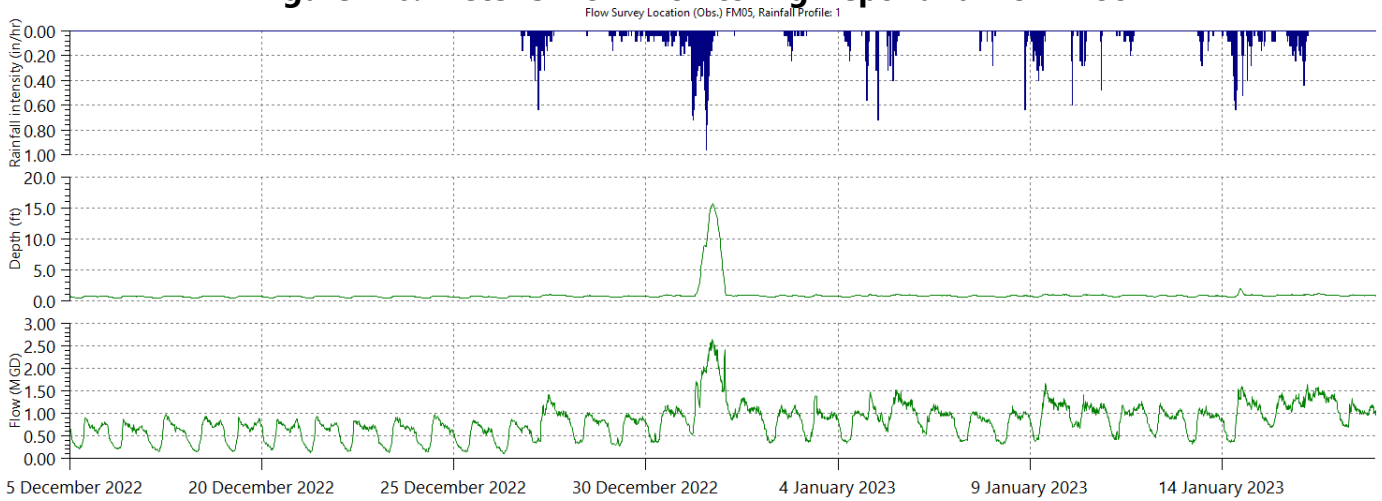


Figure B-7: Meter 6 Flow Monitoring Depth and Flow Plot

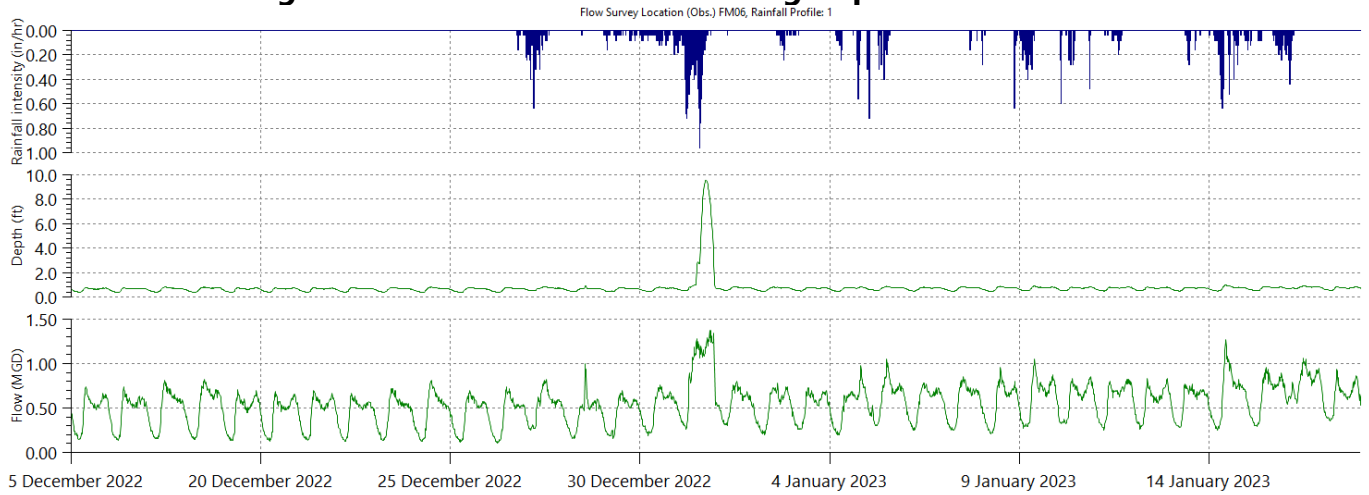


Figure B-8: Meter 7 Flow Monitoring Depth and Flow Plot

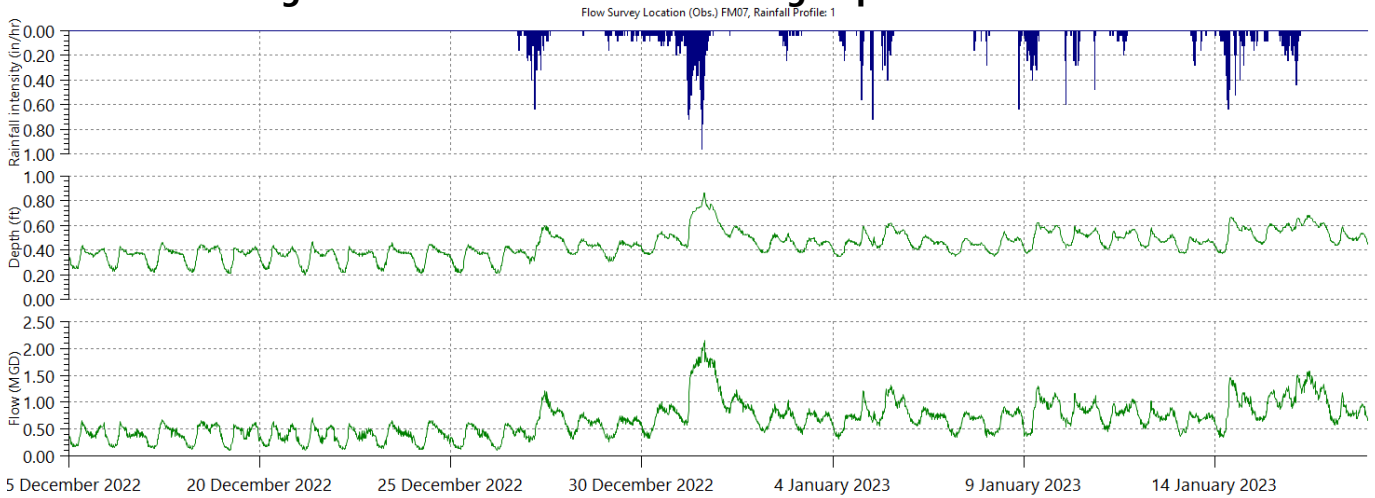


Figure B-9: Meter 8 Flow Monitoring Depth and Flow Plot

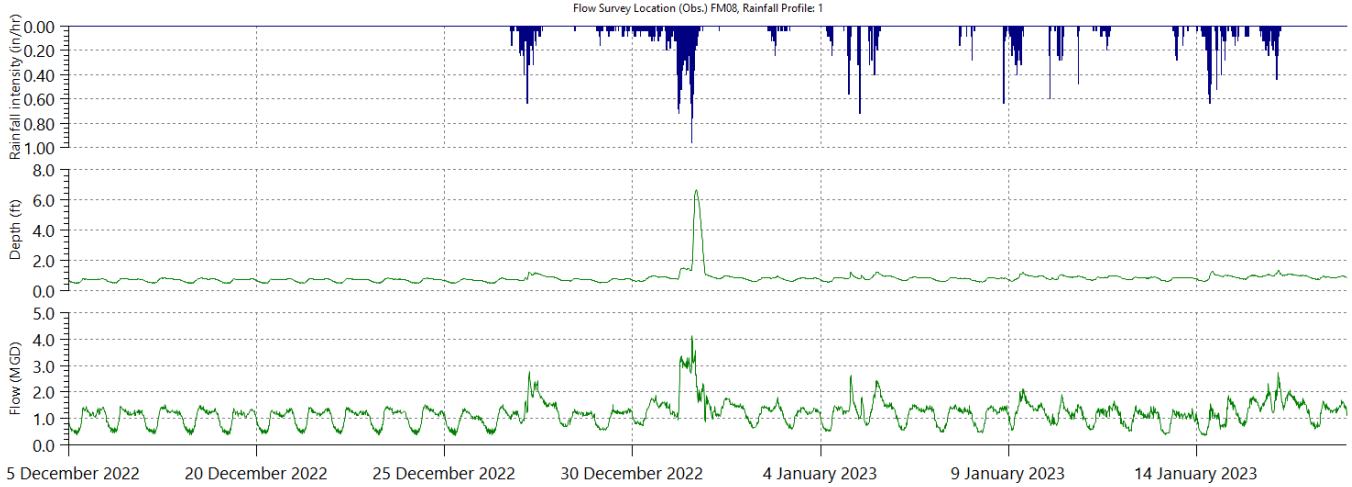


Figure B-10: Meter 9 Flow Monitoring Depth and Flow Plot

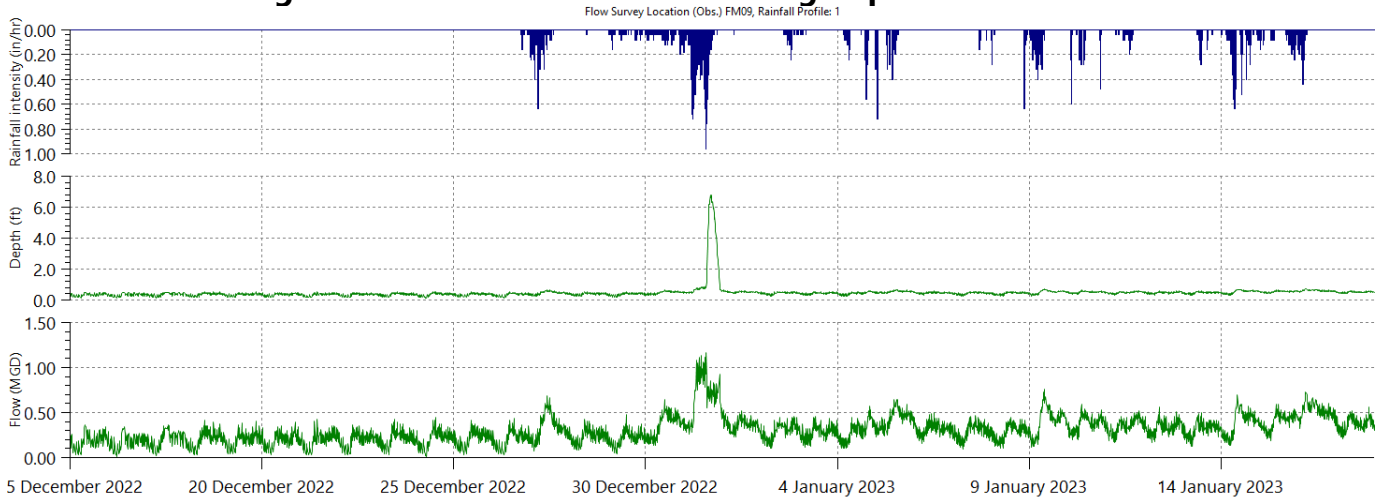


Figure B-11: Meter 10 Flow Monitoring Depth and Flow Plot

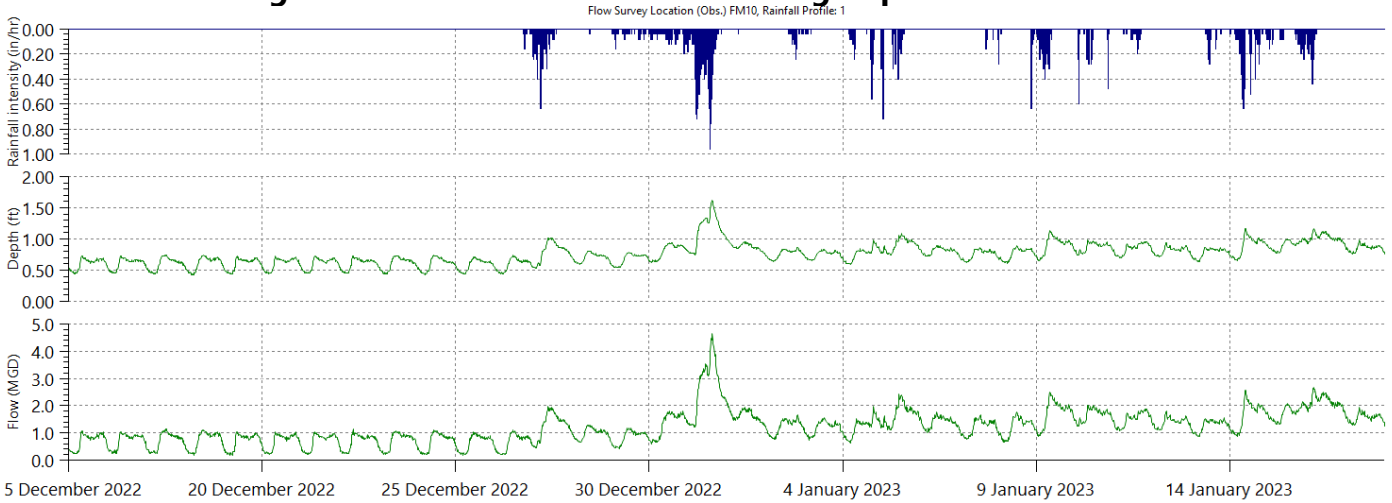


Figure B-12: Meter 10A Flow Monitoring Depth and Flow Plot

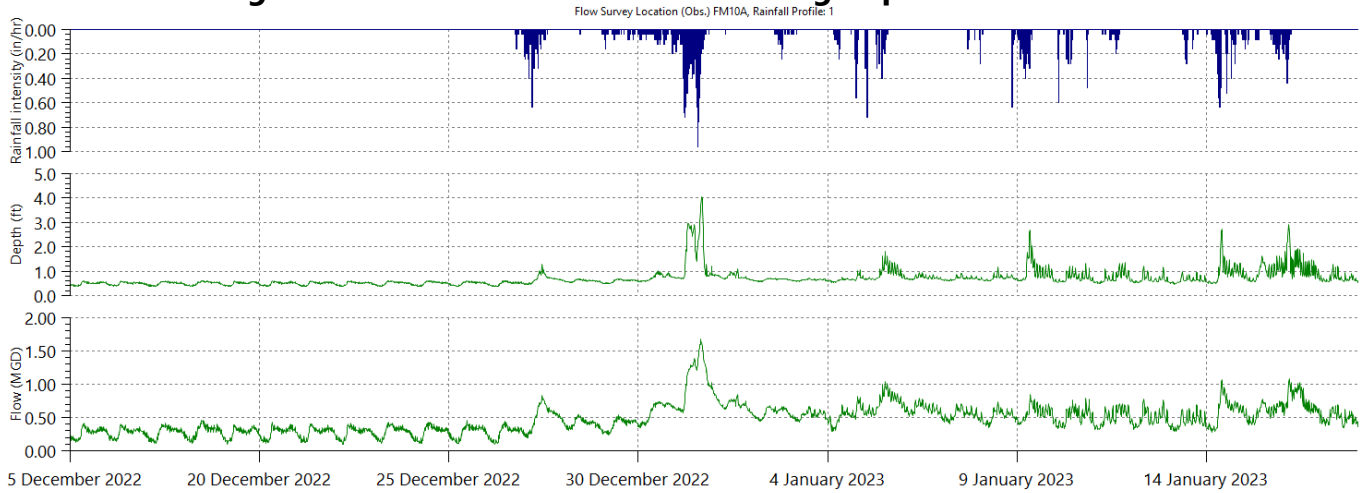


Figure B-13: Meter 11 Flow Monitoring Depth and Flow Plot

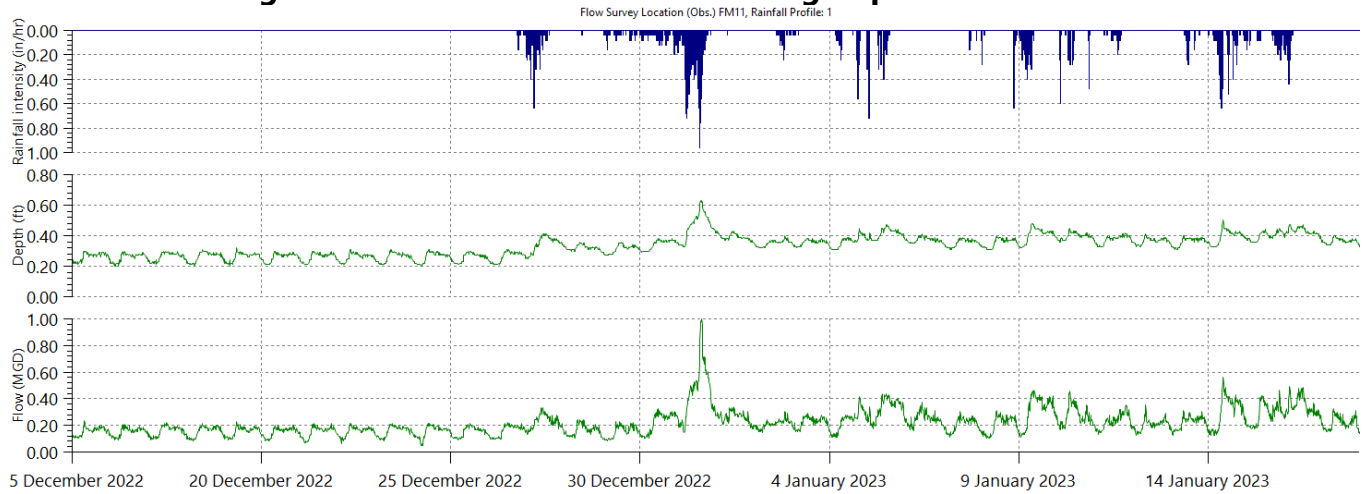
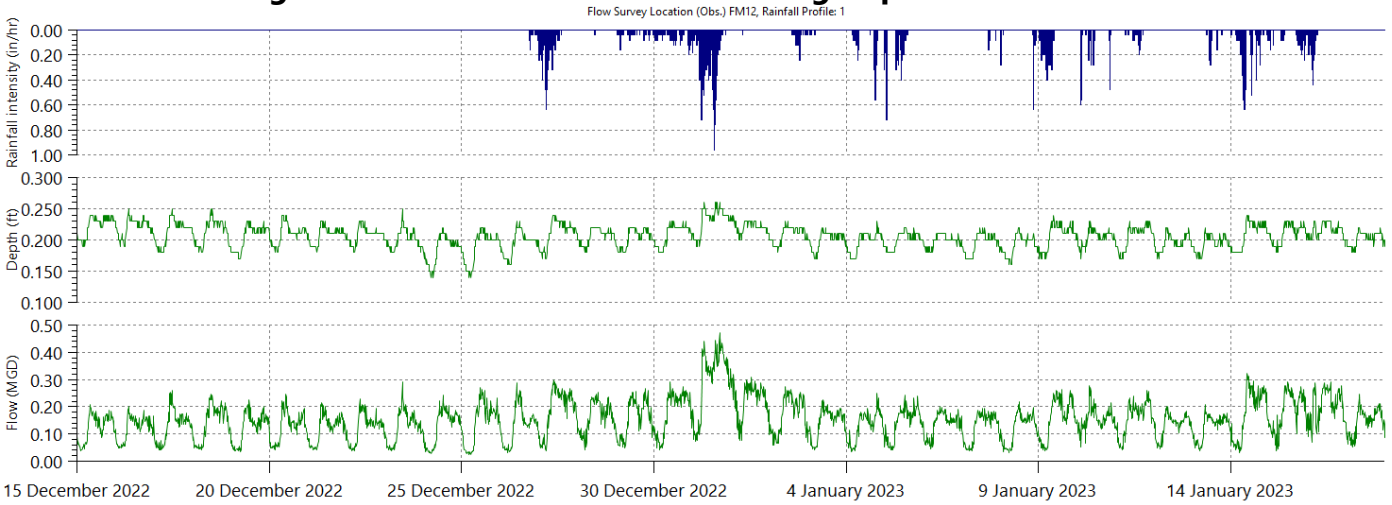


Figure B-14: Meter 12 Flow Monitoring Depth and Flow Plot



APPENDIX C – FUTURE DEVELOPMENTS

City of Pleasanton Sewer System

Sewer System
Sanitary Sewer
Future Load Subcatchments

N

Legend

- EALS Pump Station
- City Force Main
- Private Force Main
- Private Gravity Main
- Conduit
- Existing Subcatchments
- Future Load Subcatchments

FM 1
FM 2
EALS Pump Station
FM 3
FM 3A
FM 4
FM 5
FM 6
FM 7
FM 8
FM 9
FM 10
FM 10A
FM 11
FM 12

Dublin
Camp Parks Military Reservation
Dublin Hills Regional Park
Pleasanton Ridge Regional Park
Sycamore Grove Regional Park
Sunol

0 0.25 0.5 1 Miles

Woodard & Curran

Project #: 0012108
Map Created: June 2023

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:**

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
1008, 1300, 1400, 1500, 1600, & 1700 Stoneridge Mall Rd	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	900				
3300 Busch Rd	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential- Single-Family	490				
1008 Stoneridge Mall Road	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Multi-Family/Apartments	486			Application for a PUD development plan to construct 486 apartment units and related site improvements including a new parking structure at the northwest corner of Stoneridge Mall Road and Stoneridge Mall Road.	Under Review
5511, 5515, 5675 Sunol Boulevard	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	459				
Stoneridge Residential	Vacant	Development applications received 2022 from City of Pleasanton		Residential-Multi-Family	360				
725 Main St.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Commercial	0		4,503	Application for Design Review to construct an approximately 4,503-square-foot, two-story commercial building on a vacant lot.	Under Construction
4900 & 5000 Hopyard Rd	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	330				
Avalon Bay	Vacant	Development applications received 2022 from City of Pleasanton		Residential-Multi-Family	299				
4515 Rosewood Dr	Vacant	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	250				
5805 Owens Drive	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	150				
3300 Busch Rd	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	150				
4141 Foothill Road	Vacant	CDD Update 2022-09-29	APN added via lookup of development address in 2022 Assessor Parcel dataset	Residential- Single-Family	111			Preliminary Review application for 1) annexation, 2) rezoning the property from Unincorporated to PUD-LDR and PUD-BMR, and 3) a Planned Unit Development (PUD) development plan to construct a 111-home age-qualified community with 89 single-family detached homes, 22 affordable senior court-yard detached and duet homes and related on-and off-site improvements at 4141 Foothill Road.	Under Review
4750 First St	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential Multi-Family	112				
4131 & 4141 Foothill Rd	SF - SINGLE FAMILY RESIDENTIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential- Single-Family	90				
1801, 1803, 1807, 1809, 1811 Santa Rita Road & 4295, 4285, 4303, 4305 Valley Avenue	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	110				
5724 W Las Positas Blvd	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential Multi-Family	97				
2694 Stoneridge Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Commercial	0			PUD development plan to construct a 201-stall parking lot for vehicle display/inventory to be shared by Stoneridge Chrysler-Jeep-Dodge-Ram and a future auto dealership.	Under Construction
4003-4011 Pimlico Dr	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	92				
3200 Santa Rita Rd.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Commercial	0	Fire Station	8,740	Application for Design Review to demolish and replace the existing Fire Station 3 and construct a new 8,740-square-foot facility with apparatus bays, living quarters, and related site/landscaping improvements.	Approved

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
6455 Owens Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Commercial	0	Retail	10,980	Application for a PUD development plan to demolish an existing restaurant building at 6455 Owens Dr. and construct a single-story multi-tenant commercial building totaling approximately 10,000-square-feet in area.	Under Review
7200 Johnson Drive	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Commercial	0	Retail (warehouse, Costco)	148,613	Application for Design Review to construct a new 148,613-square-foot Costco. Application is on hold and will be reconsidered by the City Council in late 2019 pending completion of supplemental environmental review for the Johnson Drive Economic Development Zone due to a legal challenge. (Please also see Item 38, for additional information on the JDEDZ Lawsuit)	Under Review
7280 Johnson Drive	MF - MULTI-FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset Measured parcel area in AC Parcel Viewer at 180,000 sq ft (total size) and converted to 57,600 sq ft via average FAR of 32% from General Plan for Business Park GPLU.	Commercial		Hotel	57,600	Application for Design Review to construct two new hotels with 231 rooms and a drive-through coffee shop. Application is on hold and will be reconsidered by the City Council in Late 2019 pending completion of supplemental environmental review for the Johnson Drive Economic Development Zone. (Please also see Item 38, for additional information on the JDEDZ Lawsuit).	Under Review
4309 Hacienda Dr	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	60				
Terminus of Lund Ranch Road	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development project in Assessor Parcel GIS layer	Residential- Single-Family	43			Applications for: (1) PUD rezoning and development plan approvals to construct 43 single-family two-story homes and related site improvements on the approximately 195-acre Lund Ranch II property located at 1500 Lund Ranch Rd.; (2) Development Agreement to vest entitlements for the project; (3) certification of the Final Environmental Impact Report (EIR) prepared for the project; (4) Growth Management Agreement; and (5) Affordable Housing Agreement. Project includes approximately 160-acres of dedicated open space. Project submitted to June 7, 2016 ballot following February 2016 City Council approval; majority of voters supported project moving ahead.	Approved
2350 Santa Rita Rd.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Commercial	0	Carpenter's Training Center	87,000	Application for a PUD development plan to demolish the existing 67,000-square-foot building and construct a new 87,000-square-foot two-story Carpenter's Training Center.	Under Construction
1700 Stoneridge Mall Road	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Commercial	0	Retail, gym	255,420	Application for Design Review approval to demolish the existing Sears Department store (approximately 176,151-square feet) and construct up to 255,420-square-feet (79,269-square-feet of net increase) of new retail, cinema, specialty, and health club facility uses.	Approved
4400 Black Ave	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential Multi-Family	52				
2025 Santa Rita Rd	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential Multi-Family	46				
4884 Harrison Street	Vacant	Development applications received 2022 from City of Pleasanton	APN added via lookup of development address in 2022 Assessor Parcel dataset	Residential-Multi-Family	46				
4001 Stoneridge Dr	Vacant	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential Multi-Family	44				
4780 Chabot Dr	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential-Multi-Family	41				
1087 and 11033 Dublin Canyon Rd	Vacant	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential- Single-Family	31				

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
3780 Stanley Blvd., future 3701 Nevada St.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Residential Multi-Family	31			Application for a PUD development plan to construct an affordable 31 unit multi-family residential community for individuals with special needs including a 5,000-square-foot community building with associated site improvements on a vacant property to be dedicated to the city as part of Homestead at Irby Ranch.	Under Construction
Vineyard Ave, btwn. Thiessen St and Manoir Ln	Vacant	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential- Single-Family	25				
4400-4460 Rosewood Dr.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
4400-4460 Rosewood Dr.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
3760 Hopyard Road	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Commercial	0	Gas Station/Car wash	4,324	Application for a PUD development plan to: 1) demolish the existing auto service, Shell service station, canopy and 7-11 store buildings; 2) construct an approximately 1,290 square-foot car wash building, an approximately 3,034 square foot 7-11 store and canopy; and 3) construct related on- and off-site improvements.	Approved
4400-4460 Rosewood Dr.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
4400-4460 Rosewood Dr.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
4400-4460 Rosewood Dr.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
3716 Stanley Blvd.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Commercial	0	Storage	205,027	Applications for Design Review and Conditional Use Permit to demolish existing storage facility buildings and office, and construct three new buildings totaling approximately 205,027-square-feet for Public Storage.	Under Review

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
4400-4460 Rosewood Dr.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
Johnson Drive Economic Development Zone (JDEDZ)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Commercial				The Johnson Drive Economic Development Zone is currently the subject of a lawsuit. The Petitioner in this lawsuit alleges that the air quality analysis contained in the Supplemental Environmental Impact Report for the JDEDZ was incomplete. The Petitioner also alleges that the economic analysis for the project should have been recirculated for public review. Given the inherent delay associated with litigation involving the California Environmental Quality Act, the City has agreed to set aside the approvals so that supplemental environmental review can take place. Once this supplemental environmental review is complete, additional public comment will occur, and the City Council will consider reapproving the project. Although this project has already been subject to extensive environmental review, the City believes that this is the most effective way to provide the public and public officials with information and allow for reconsideration of the project. Costco is in support of this approach and is a signatory to the stipulation.	Under Review
Climate Action Plan	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Other				The City of Pleasanton's Council approved 2019-2020 Work Plan includes preparation of an updated Climate Action Plan (CAP 2.0). The City's original CAP was adopted in 2012 and outlines local actions to reduce greenhouse gas (GHG) emissions, enhance environmental sustainability, and prepare for climate change. As with Pleasanton's 2012 Climate Action Plan, CAP 2.0 will continue to respond to the impacts of climate change through local actions that promote adaptation and resilience by significantly reducing the City's greenhouse gas emissions. Accounting for new state laws, the policy focus for CAP 2.0 will be to close the gap between GHG emission reduction targets and Pleasanton's projected emissions.	Under Review
Lions Wayside/Delucchi Park Master Plan – Permitting	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Other				Development of final design and construction documents for the parks master plan is pending state and federal permitting to underground the "channel" at Lions Wayside Park. City staff met with the permitting agencies and are currently developing options for the park improvements that do not require undergrounding of the channel due to the regulatory agencies' position that it will not be allowed.	Under Review
Bicycle and Pedestrian Master Plan High Priority Corridor	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				The Pedestrian and Bicycle Master Plan, created in January 2010 was updated and adopted by City Council in June 2017. The update created an "All users and abilities" approach to facility design and provided a corridor construction priority. West Las Positas Boulevard was identified as the highest priority corridor and design is underway to develop bicycle and pedestrian improvements along the corridor.	Under Review

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
Overcrossing Improvement Plan for Pedestrians and Bicycles	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				City Council at its September 13, 2016 meeting awarded the Freeway Overcrossing Improvement Plan project. This plan identified needed improvements and an implementation strategy to improve bicycle and pedestrian facilities at the freeway overcrossings. Included with project deliverables is a set of plans for each overcrossing that will be used for future construction. The were completed and presented to City Council in December of 2018.	Completed
Bernal Avenue at Nevada Street Traffic Signal Installation	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				Nevada Street is currently under construction to connect Stanley Boulevard to Bernal Aenue. When completed the increased volume on Nevada Street requires a traffic signal to be constructed at Bernal Avenue. When properly used, traffic signals are valuable devices for the control of vehicular and pedestrian traffic. They assign the right-of-way to the various traffic movements and profoundly influence traffic flow while reducing the frequency and severity of certain types of crashes, especially right-angle collisions.	Under Review
Automated Traffic Signal Performance Measures	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				The City was awarded the Innovative Deployments to Enhance Arterials (IDEA) Challenge Grant. This grant encourages local agencies to implement cutting edge technological solutions to help improve travel time, safety, and traffic operations reliability for all modes of transportation. The City will implement Automated Traffic Signal Performance Measures (ATSPM) technology that can measure the performance of a single signalized intersection or a corridor of signalized intersections, as well as, provide origin and destination data of vehicles. Some performance measures include, but are not limited to, travel time, travel speed, traffic volumes, and delay. The data can be measured against historical data to better understand traffic trends, efficiency, and understand travel patterns, all of which will aid staff in improving overall traffic operations. Lastly, this project will look to integrate other traffic related data, such as Waze, to achieve a comprehensive set of information between the city's traffic signals and the road user themselves. This technology will be installed at approximately 45 signalized intersections.	Under Review
Sunol Boulevard Interchange	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				The Sunol Boulevard Interchange is in the Caltrans Right of Way, but any improvements to local interchanges are funded by the local agency. The City issued a request for proposals in late 2017 to design a set of signalized intersections at the two ramp locations. The Project Study Report- Project Developement Study (PSR-PDS) document has been officially signed off by Caltrans on January 17, 2020. The PSR-PDS is the initial document required for the Caltrans project development process.	Under Review

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
Internally Illuminated Street Name Sign Replacement with LED	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				The city's internally illuminated street name signs (IISNS) are becoming faded and require replacement. The city is in its fourth year of a 5-year plan to replace the existing fluorescent tube IISNS with LED IISNS. The LED signs consume less power which will reduce the power cost per intersection as well as the carbon footprint of the city. Installation of the IISNS started in May 2016. Over 100 signs have already been replaced. The focus this year will continue to be on the most faded signs which are along several arterials in the city. The 2019 installations are complete.	Under Review
Owens at Iron Horse Trail Crossing Modification	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				Staff presented the results of the six-month study to City Council in January 2018 and Council recommended that an adaptive signal timing system be purchased to address the one-two minutes per day where congestion remains. A Capital Improvement Program (CIP) to install adaptive signal system was added to the 2018/19 CIP.	Completed
Intersections of Stanley/Valley/Bernal, Santa Rita/Valley, Santa Rita/Stoneridge	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				Installation of next generation traffic signal equipment for signal performance, conflict analysis, origin-destination studies, multi-modal traffic safety, and connected vehicle applciations.	Under Construction
West Las Positas	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				Residents along West Las Positas (between Fairlands Elementary School and Staples Ranch) have called for concerns about speeding. This section of West Las Positas was evaluated as part of the Traffic Calming program and was the top ranked street eligible for traffic calming. An inital public meeting was held on December 5, 2018 to describe the program, the data collected and next steps should the neighborhood wishes to continue forward with the program.	Under Review
Junipero Street and Independence Drive	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				In November 2015, City Council directed staff to meet with the residents of Junipero Street and Independence Drive to discuss potential solutions to their traffic-related concerns. Staff began meeting with the neighborhood in March 2016. Staff and the steering committee met through the summer of 2016 and developed a traffic calming plan which included traffic signal metering, radar speed signs, new crosswalks, speed reduction on Independence Drive, six speed lumps and a major modification to the arterial intersection of Bernal Avenue at Sunol Boulevard/ First Street. The plan was presented to City Council in September 2017 and construction was completed in the winter of 2017 with the exception of the arterial intersection improvements. The arterial intersection design is underway (March of 2018) and design completion is expected in the spring of 2020. Prior to the completion of the design, alternatives will be presented to the surrounding neighborhoods and the Pleasanton Unified School District to receive feedback (Winter 2019).	Under Review

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
Vintage Hills Elementary	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				This project addresses two concerns for the Vintage Hills Elementary School community and surrounding neighborhood. 1) Residents of Concord Street requested traffic calming measures to address speeding concerns that are present outside of school hours. The Concord Street steering committee has elected to install three speed lumps along Concord Street between Palomino Drive and Touriga Drive. In addition, curb-extensions (bulb-outs) are proposed at the intersection of Palomino Drive and Concord Drive. This will reduce the crossing distance on Palmino Drive and Concord Drive for school related pedestrians walking to Vintage Hills Elementary. It also requires motorists to slow down as they turn through the intersection. Currently, the steering committee is collecting the required petition signatures for the speed lumps and bulb-out proposal. 2) Community members of Vintage Hills Elementary School are concerned about safety going to and leaving school.	Under Review
Touriga Drive	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				The Touriga Drive residents have been part of two previous Neighborhood Traffic Calming Programs that included the installation of several radar speed signs. Speed lumps were proposed in both of the previous programs, but the speed lumps never received the required neighborhood support for installation. While speeds were reduced as a result of the radar speed sign installations, sections of Touriga Drive continue to experience speeds above the posted limit. In early 2019 residents of Touriga Drive expressed continued concerns of speeding on between Chablis Court and Palomino Drive. The residents believed that enough neighborhood support for speed lumps was in place to allow for the expedited speed lump program to be implemented. Speeds were measured and found to be higher than the average residential streets and an Expedited Speed Lump petition was created for Touriga Drive. The petition included three speed lumps between Chablis Court and Palomino Drive.	Completed
State Route 84	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				SR 84 from Pigeon Pass to I-680 has completed environmental review and Caltrans adopted the environmental document in the summer of 2018. Preliminary engineering and design has started . The design process and right of way acquisition will take approximately two years with construction to follow in 2021. Construction of the segment of SR 84 from Pigeon Pass to I-680 will be the final segment in a series of improvements to widen SR 84 to expressway standards from I-580 in Livermore to I-680 in Sunol. Environmental review of the SR 84 project began in 2002, and completion of this final segment will conclude this nearly 20-year project.	Under Review

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
Bart to Ace	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				In October 2017 the Governor signed Assembly Bill 758 which created The Tri-Valley – San Joaquin Valley Regional Rail Authority. This new authority has been created for the sole purpose of connecting Bart to ACE. The Authority has selected a hybrid powered, multiple-unit vehicle technology with the ability to convert to fully electric power in the future Valley Link is proposing to provide a new rail service from the existing Dublin / Pleasanton BART Station to San Joaquin County, utilizing existing rights-of-way in the center of the I-580 corridor to provide connectivity between ACE and Bart. Valley Link is proposed to provide frequent, all-day regional rail service with future expansion all the way to Lathrop in the Central Valley As a first phase in the Valley Link project, the Authority has recommended an initial segment serving the RM3 project corridor, originating from a BART connection at Dublin/Pleasanton Station and continuing to a proposed	Under Review
680 Express Lane Projects	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Transportation/Traffic Project				The 680 Express Lane is two separate projects. One will construct a new 15-mile express lane from SR 237 in Milpitas to SR 84 in Sunol. The second will extend the express lane from SR 84 to Alcosta.	Approved
East Pleasanton Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	East Pleasanton Specific Plan Revision 1 November 2014, Figure 5.1 Land Use Plan						
Downtown Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	(no data provided in v1 of model, but can be updated at a later date)						
East Bernal Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	(no data provided in v1 of model, but can be updated at a later date)						
Hacienda Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	(no data provided in v1 of model, but can be updated at a later date)						
Happy Valley Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	(no data provided in v1 of model, but can be updated at a later date)						
Laguna Oaks Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	(no data provided in v1 of model, but can be updated at a later date)						
North Sycamore Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	(no data provided in v1 of model, but can be updated at a later date)						
Stoneridge Drive Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	(no data provided in v1 of model, but can be updated at a later date)						
Vineyard Corridor Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	(no data provided in v1 of model, but can be updated at a later date)						
West Bernal Specific Plan Area Boundary	Vacant	Zone 7 Demand Study	(no data provided in v1 of model, but can be updated at a later date)						
1701 Springdale Dr	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 Description and Commerical_SF updated based on Septmeber 2022 CDD Update Parcel # updated manually from review of AC parcel viewer (no tabular data in Nov 2022 dataset)	Commercial/Master Planned Campus		Commercial	381,000	Applications for a Planned Unit Development (PUD) Rezoning and Development Plan to: (1) demolish the existing approximately 163,500-square-foot commercial buildings; (2) rezone the subject parcel from C-R (p) (Regional Commercial - peripheral sites) District to PUD-C-O (Planned Unit Development – Commercial-Office) District; and (3) construct up to three new multi-story research and development, office and laboratory buildings totaling approximately 381,000-square-feet, a parking structure, and related site improvements over multiple phases.	Under Review

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
4400-4460 Rosewood Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
4400-4460 Rosewood Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
4400-4460 Rosewood Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
4400-4460 Rosewood Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	30.5	Retail	752	Application for a PUD development plan to construct 305 apartment units and 7,520-square-feet of retail space on the approximately 8.4-acre southern portion of the Rosewood Commons property. A parking garage and additional surface parking will be constructed on the remaining 52.5-acres to serve the existing office uses.	Approved
3949 Bernal Ave	CM - COMMERCIAL	Potential Housing Sites for 2023-2031 Inventory Rezoning 2023.02	APN provided by City of Pleasanton CDD	Residential- Single-Family	19				
1000 Minnie St	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	13		-	Applications for General Plan Amendment, Specific Plan Amendment, PUD development plan, Growth Management, and subdivision to rezone the site and construct a 39 single-family home development on the approximately 31-acre portion of the 154-acre site.	Under Review
1000 Minnie St	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	13		-	Applications for General Plan Amendment, Specific Plan Amendment, PUD development plan, Growth Management, and subdivision to rezone the site and construct a 39 single-family home development on the approximately 31-acre portion of the 154-acre site.	Under Review
1000 Minnie St	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	13		-	Applications for General Plan Amendment, Specific Plan Amendment, PUD development plan, Growth Management, and subdivision to rezone the site and construct a 39 single-family home development on the approximately 31-acre portion of the 154-acre site.	Under Review
10807, 11033 and the two western parcels on Dublin Canyon Road	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	11		-	Applications for: (1) annexation of four parcels totaling approximately 128.5-acres; (2) amend General Plan Land Use designations to correspond to proposed residential and open space areas; (3) rezone the property from unincorporated and pre-zoned Agriculture to Low Density Residential and Open Space; (4) a PUD development plan to construct 33 single-family homes, including demolition and replacement of two existing homes, with private open space, and dedication of 72.1 acres of land to the East Bay Regional Park District (EBRPD), and construct an EBRPD staging area with trail connections to the Pleasanton Ridge.	Under Review

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
10807, 11033 and the two western parcels on Dublin Canyon Road	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	11		-	Applications for: (1) annexation of four parcels totaling approximately 128.5-acres; (2) amend General Plan Land Use designations to correspond to proposed residential and open space areas; (3) rezone the property from unincorporated and pre-zoned Agriculture to Low Density Residential and Open Space; (4) a PUD development plan to construct 33 single-family homes, including demolition and replacement of two existing homes, with private open space, and dedication of 72.1 acres of land to the East Bay Regional Park District (EBRPD), and construct an EBRPD staging area with trail connections to the Pleasanton Ridge.	Under Review
10807, 11033 and the two western parcels on Dublin Canyon Road	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	11		-	Applications for: (1) annexation of four parcels totaling approximately 128.5-acres; (2) amend General Plan Land Use designations to correspond to proposed residential and open space areas; (3) rezone the property from unincorporated and pre-zoned Agriculture to Low Density Residential and Open Space; (4) a PUD development plan to construct 33 single-family homes, including demolition and replacement of two existing homes, with private open space, and dedication of 72.1 acres of land to the East Bay Regional Park District (EBRPD), and construct an EBRPD staging area with trail connections to the Pleasanton Ridge.	Under Review
536 and 550 St. John St. and adjacent vacant parcel	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Multi-Family/Townhomes	12		-	Applications for a PUD development plan to rezone three parcels (total area approximately 31,800-square-feet), subdivide the lot, retain and relocate the existing historic single-family residence on-site, and construct 10 two-story townhomes.	Completed
475 St. John Street	CM - COMMERCIAL	CDD Update 2022-09-29	APN added via lookup of development address in 2022 Assessor Parcel dataset	Mixed-Use Development	7		3,342	(1) rezone the properties from Central-Commercial (C-C) to PUD-MU; (2) development plan approval to: (a) retain the two-story single-family home; (b) demolish the detached accessory dwelling unit, Barone's restaurant, and all other structures and site modifications; and (c) construct 14 attached single-family homes, two commercial buildings with a public courtyard, and related site improvements.	Under Review
493 St. John Street	SF - SINGLE FAMILY RESIDENTIAL	CDD Update 2022-09-29	APN added via lookup of development address in 2022 Assessor Parcel dataset	Mixed-Use Development	7		3,342	(1) rezone the properties from Central-Commercial (C-C) to PUD-MU; (2) development plan approval to: (a) retain the two-story single-family home; (b) demolish the detached accessory dwelling unit, Barone's restaurant, and all other structures and site modifications; and (c) construct 14 attached single-family homes, two commercial buildings with a public courtyard, and related site improvements.	Under Review
2188 Foothill Rd.	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	6		-	Application for a PUD development plan to subdivide an approximately 12-acre site into up to seven lots for custom single-family homes, and develop a hiking/biking trail connecting to Augustin Bernal Park.	Under Review
124/126 Spring Street	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Mixed-Use Development	6		4,418	Application for Design Review to construct six new, three-story, micro-units behind the existing commercial building.	Under Review

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
4791 Augustine St.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Mixed-Use Development	6		1,800	Application for PUD development plan to rezone, demolish all existing structures, and construct an approximately 2,000-square-foot, three-story mixed-use building with office/retail space on the first floor and three apartments on the second and third floors; and construct three, three-story, detached single-family homes, one with ground-floor commercial space	Under Construction
1851 Rose Ave.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	4.75		-	Application for a PUD development plan to construct 19 single-family homes and related site improvements on an approximately 9.02-acre property.	Under Construction
1851 Rose Ave.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	4.75		-	Application for a PUD development plan to construct 19 single-family homes and related site improvements on an approximately 9.02-acre property.	Under Construction
1851 Rose Ave.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	4.75		-	Application for a PUD development plan to construct 19 single-family homes and related site improvements on an approximately 9.02-acre property.	Under Construction
1851 Rose Ave.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	4.75		-	Application for a PUD development plan to construct 19 single-family homes and related site improvements on an approximately 9.02-acre property.	Under Construction
273 Spring St.	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Mixed-Use Development	5		1,822	Application for a Planned Unit Development (PUD) development plan to rezone site, demolish an existing 910-square-foot single-story commercial building on the site, and construct an approximately 1,822-square-foot commercial building with two attached, three-story multi-family residential units; and three, three story multi-family residential units in a separate building at the rear of the site. Units range between approximately 1,988-2,482-square-feet.	Under Construction
273 SPRING ST, PLEASANTON, CA 94566 & 281 SPRING ST, PLEASANTON, CA 94566	CM - COMMERCIAL	Zone 7 Demand Study	City of Pleasanton Housing Element Annual Progress Report 2020	Residential Multi-Family	5				
990 Sycamore Road	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	4		-	Applications for: 1) an amendment to the North Sycamore Specific Plan (NSSP) to: a) change the land use designation of an approximately 1.01-acre portion of the site from Planned Unit Development – Agricultural (PUD-A) to Planned Unit Development – Low Density Residential (PUD-LDR); b) allow the proposed PUD-LDR lots to access from Sycamore Creek Way; c)realign the planned public trail on the project site; 2) PUD development plan approval for a five-lot single-family residential development with related on- and off-site improvements; and 3) Vesting Tentative Subdivision Map approval to subdivide the 3.28-acre parcel into five residential lots for four new homes and one existing home.	Under Review
715 Rose Avenue	SF - SINGLE FAMILY RESIDENTIAL	CDD Update 2022-09-29	APN added via lookup of development address in 2022 Assessor Parcel dataset	Residential- Multi-Family/Apartments	4			Application for Design Review approval to retain the single-family home, demolish the detached garage, and construct two new, two-story detached structures with three new dwelling units on the property.	Approved

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
11249 Dublin Canyon Rd.	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Residential- Single-Family	2		-	Applications for: (1) PUD development plan for three single-family residential lots (one existing single-family residence and two new single-family residences); (2) Minor Subdivision approval to subdivide the existing 2.91-acre parcel into three parcels; and (3) Growth Management allocation.	Under Construction
3987 Stanley Boulevard	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020 APN added via lookup of development address in 2020 Assessor Parcel dataset	Residential- Single-Family	3		-	Application for a PUD development plan to demolish an existing residence and construct three new 1,837-square-feet two-story single family homes.	Approved
4212 First Street	SF - SINGLE FAMILY RESIDENTIAL	CDD Update 2022-09-29	APN added via lookup of development address in 2022 Assessor Parcel dataset	Residential- Single-Family	3			Application for a Planning Unit Development and Rezoning, General Plan Amendment, and Tentative Tract Map, to demolish an existing service station and single-family dwelling and construct six new detached two-story single-family homes with associated site improvements.	Under Review
4226 First Street	CM - COMMERCIAL	CDD Update 2022-09-29	APN added via lookup of development address in 2022 Assessor Parcel dataset	Residential- Single-Family	3			Application for a Planning Unit Development and Rezoning, General Plan Amendment, and Tentative Tract Map, to demolish an existing service station and single-family dwelling and construct six new detached two-story single-family homes with associated site improvements.	Under Review
6900 Valley Trails Dr.	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021	Residential Single-Family	1.2			Application for a PUD	Under construction
6900 Valley Trails Dr.	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021	Residential Single-Family	1.2			Application for a PUD	Under construction
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
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6900 Valley Trails Dr.	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021	Residential Single-Family	1.2			Application for a PUD	Under construction
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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
6900 Valley Trails Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021	Residential Single-Family	1.2			Application for a PUD	Under construction

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
6900 Valley Trails Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021	Residential Single-Family	1.2			Application for a PUD	Under construction
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6900 Valley Trails Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021	Residential Single-Family	1.2			Application for a PUD	Under construction
6900 Valley Trails Dr.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021	Residential Single-Family	1.2			Application for a PUD	Under construction
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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	SF - SINGLE FAMILY RESIDENTIAL	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-	Application for a PUD development plan to construct an affordable 31 unit multi-family residential community for individuals with special needs including a 5,000-square-foot community building with associated site improvements on a vacant property to be dedicated to the city as part of Homestead at Irby Ranch.	Under Construction
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
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APN_941 140000213	Vacant	Zone 7 Demand Study	Small corner of large DSRSD parcel that falls within COP service area causing issues with RW lookup tab default Online Year (buildout) projections.	No Development, value adjusted for zone 7 demand study. No foul flow generated for ICM model					
APN_941 140102302	Vacant	Zone 7 Demand Study	Small corner of large DSRSD parcel that falls within COP service area causing issues with RW lookup tab default Online Year (buildout) projections.	No Development, value adjusted for zone 7 demand study. No foul flow generated for ICM model					

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APN_941 157000403	Vacant	Zone 7 Demand Study	Small corner of large DSRSD parcel that falls within COP service area causing issues with RW lookup tab default Online Year (buildout) projections.	No Development, value adjusted for zone 7 demand study. No foul flow generated for ICM model					
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
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11300 Dublin Canyon Rd.	CM - COMMERCIAL	CDD Update 2022-09-29	APN added via lookup of development address in 2022 Assessor Parcel dataset Parcel # updated manually from review of AC parcel viewer (no tabular data in Nov 2022 dataset)	Commercial	0	Church	34,763	Application for Planned Unit Development (PUD) Major Modification, Minor Subdivision, and Conditional Use Permit to construct and operate a 9,742-square-foot Greek Orthodox Church and 24,971-square-foot community center at 11300 Dublin Canyon Road	Approved
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
3000 Busch Road	CM - COMMERCIAL	CDD Update 2022-09-29		Commercial	0		185,000	Applications for: 1) Design Review to construct an approximately 711, 800-square-foot sortation center; and 2) Conditional Use Permit approval to operate a light industrial use exceeding 75,000 gross square-feet in area; OR Applications for: 1) Design Review approval to construct an approximately 185,000-square-foot delivery station ; and 2) Conditional Use Permit approval to operate a light industrial use exceeding 75,000 gross square-feet in area.	Under Review
236 Ray Street	CM - COMMERCIAL	CDD Update 2022-09-29	APN added via lookup of development address in 2022 Assessor Parcel dataset	Other				Application for Administrative Design Review approval to construct an approximately 25-foot tall, 1,510-square-foot two-story detached accessory structure with a carport in the rear yard of an existing residence at 236 Ray Street.	Approved

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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
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"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
"3988 First St. and 3878 and 3780 Stanley Blvd." and "3780 Stanley Blvd., future 3701 Nevada St." (combined two projects from CDD Update)	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 - selected all parcels within PUD-HDR Ordinance 2157 region in City's website.	Residential- Single-Family	1.102803738		-		
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, February 2020	Residential- Single-Family	1		-	Minor Modification to the approved PUD for the Austin property, consisting of eight new single-family home lots.	Approved
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 This is the existing parcel from the parcel map provided by Zone 7 in early 2020 for initial model. It has been subdivided in Alameda County records as of April 2021 when last checked. Indivdiual 8 units have been added in rows below.	Residential Single-Family	1			Minor modification to approved PUD	Under construction
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 This is a single lot - contained within one existing parcel from the parcel map provided by Zone 7 in early 2020 for initial model. It has been subdivided in Alameda County records as of April 2021 when last checked. Indivdiual 8 units have been added separately.	Residential Single-Family	1			Minor modification to approved PUD	Under construction
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 This is a single lot - contained within one existing parcel from the parcel map provided by Zone 7 in early 2020 for initial model. It has been subdivided in Alameda County records as of April 2021 when last checked. Indivdiual 8 units have been added separately.	Residential Single-Family	1			Minor modification to approved PUD	Under construction
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 This is a single lot - contained within one existing parcel from the parcel map provided by Zone 7 in early 2020 for initial model. It has been subdivided in Alameda County records as of April 2021 when last checked. Indivdiual 8 units have been added separately.	Residential Single-Family	1			Minor modification to approved PUD	Under construction
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 This is a single lot - contained within one existing parcel from the parcel map provided by Zone 7 in early 2020 for initial model. It has been subdivided in Alameda County records as of April 2021 when last checked. Indivdiual 8 units have been added separately.	Residential Single-Family	1			Minor modification to approved PUD	Under construction

Development Address	Existing Land Use	Data Source General	Data Source Detailed	Development Type	Housing Units Added	Commerical Development Type	Commercial Square Footage Added	Project Descrption	Development Status
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 This is a single lot - contained within one existing parcel from the parcel map provided by Zone 7 in early 2020 for initial model. It has been subdivided in Alameda County records as of April 2021 when last checked. Indivdiual 8 units have been added separately.	Residential Single-Family	1			Minor modification to approved PUD	Under construction
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 This is a single lot - contained within one existing parcel from the parcel map provided by Zone 7 in early 2020 for initial model. It has been subdivided in Alameda County records as of April 2021 when last checked. Indivdiual 8 units have been added separately.	Residential Single-Family	1			Minor modification to approved PUD	Under construction
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 This is a single lot - contained within one existing parcel from the parcel map provided by Zone 7 in early 2020 for initial model. It has been subdivided in Alameda County records as of April 2021 when last checked. Indivdiual 8 units have been added separately.	Residential Single-Family	1			Minor modification to approved PUD	Under construction
3459 Old Foothill Rd.	Vacant	Zone 7 Demand Study	City of Pleasanton Community Development Department Update report, April 2021 This is a single lot - contained within one existing parcel from the parcel map provided by Zone 7 in early 2020 for initial model. It has been subdivided in Alameda County records as of April 2021 when last checked. Indivdiual 8 units have been added separately.	Residential Single-Family	1			Minor modification to approved PUD	Under construction
Arroyo Lago	Vacant	East Pleasanton Assumed Future Loads		Residential Single-Family	243				
Steelwave North	Vacant	East Pleasanton Assumed Future Loads		Commercial/Industrial			300,000		
Steelwave B	Vacant	East Pleasanton Assumed Future Loads		Commercial/Industrial			1,370,615		
"Amazon"	Vacant	East Pleasanton Assumed Future Loads		Commercial/Industrial			830,471		

APPENDIX D – DRY WEATHER MODEL CALIBRATION GRAPHS

Figure D-1: Flow Meter 1 Dry Weather Calibration

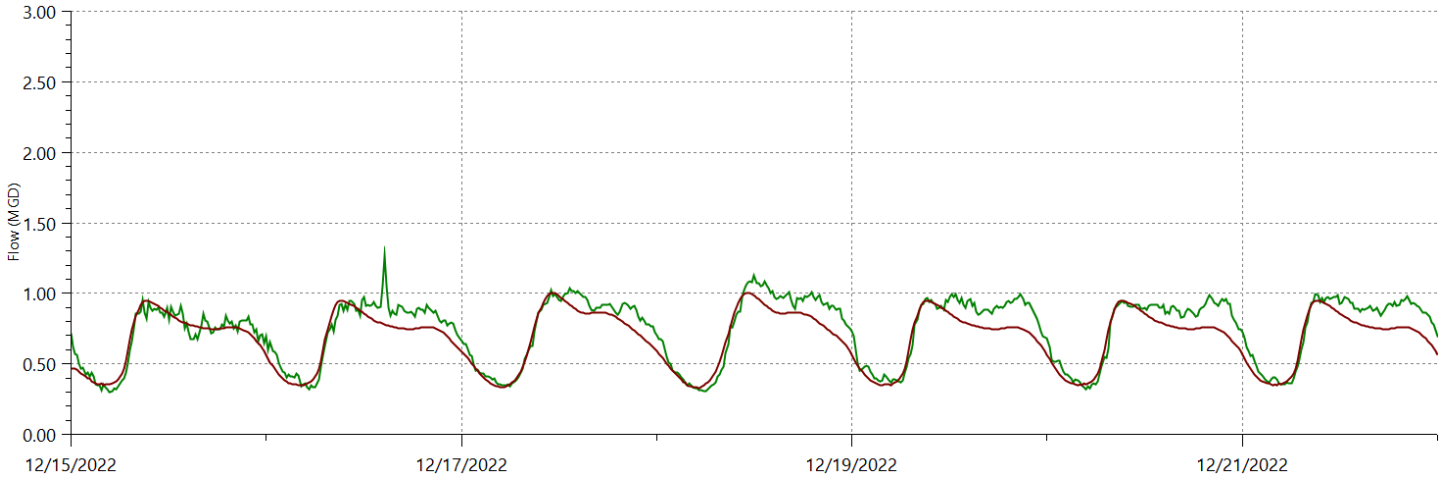


Figure D-2: Flow Meter 2 Dry Weather Calibration

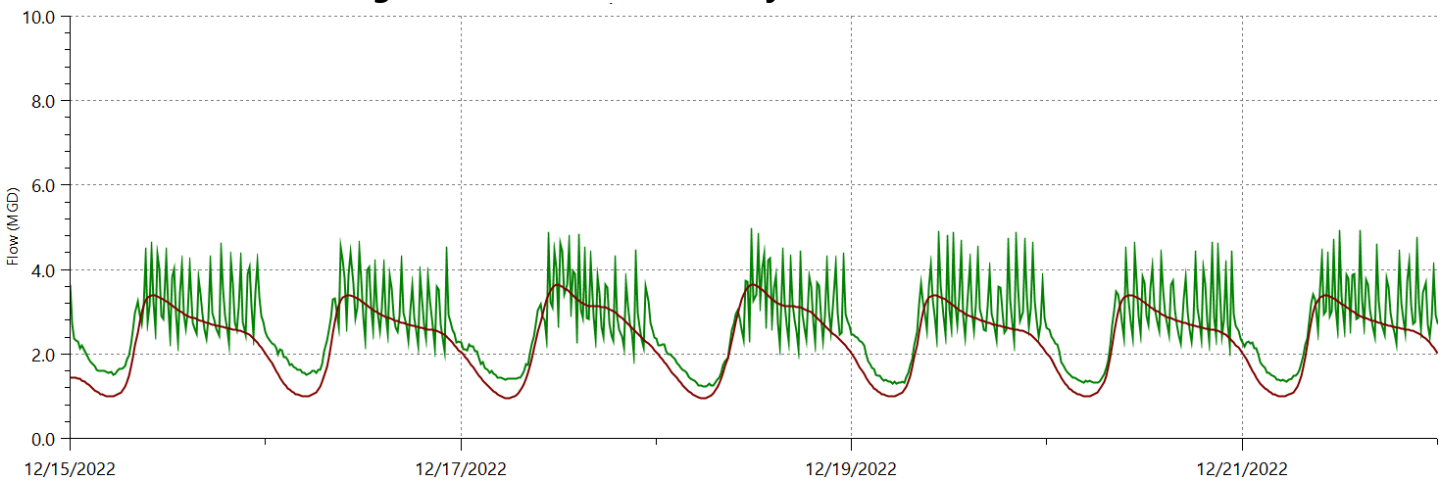


Figure D-3: Flow Meter 3 Dry Weather Calibration

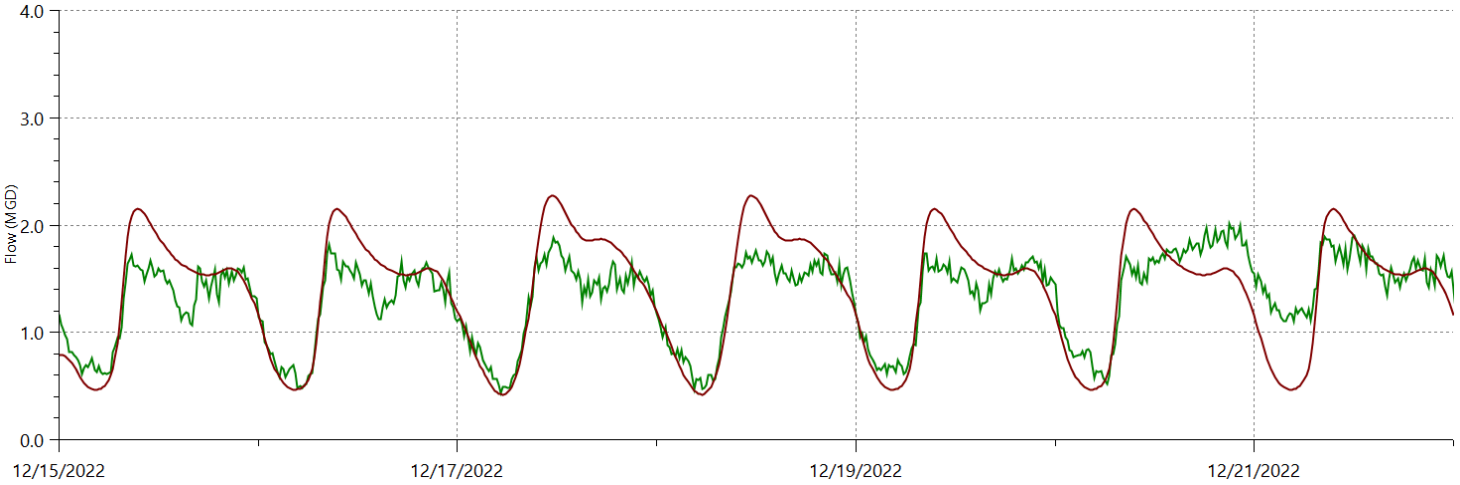


Figure D-4: Flow Meter 3A Dry Weather Calibration

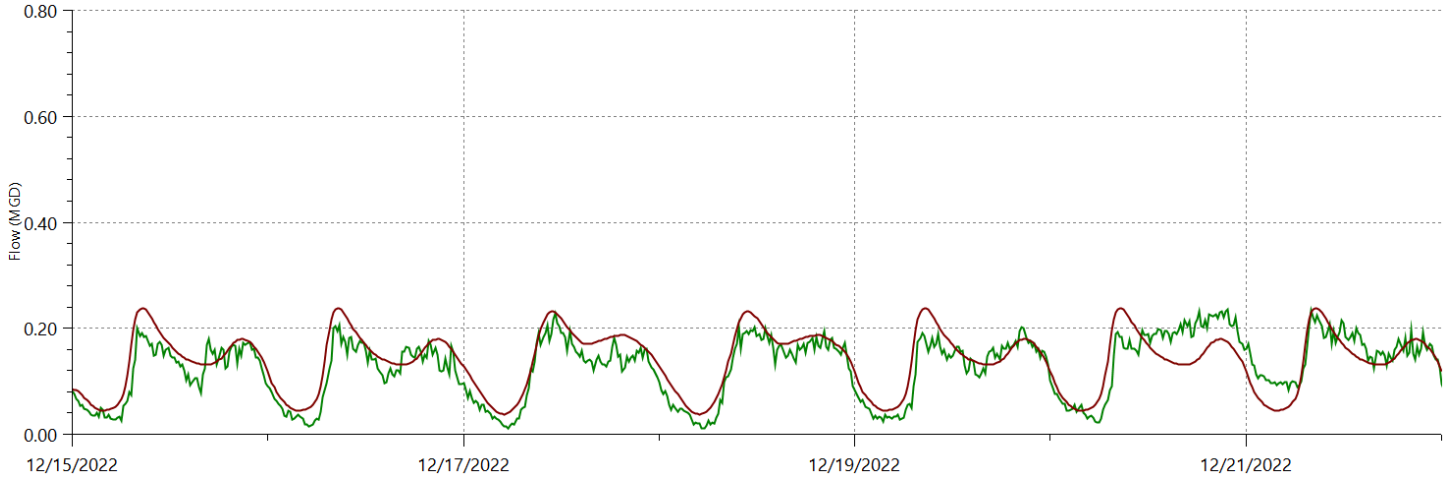


Figure D-5: Flow Meter 4 Dry Weather Calibration

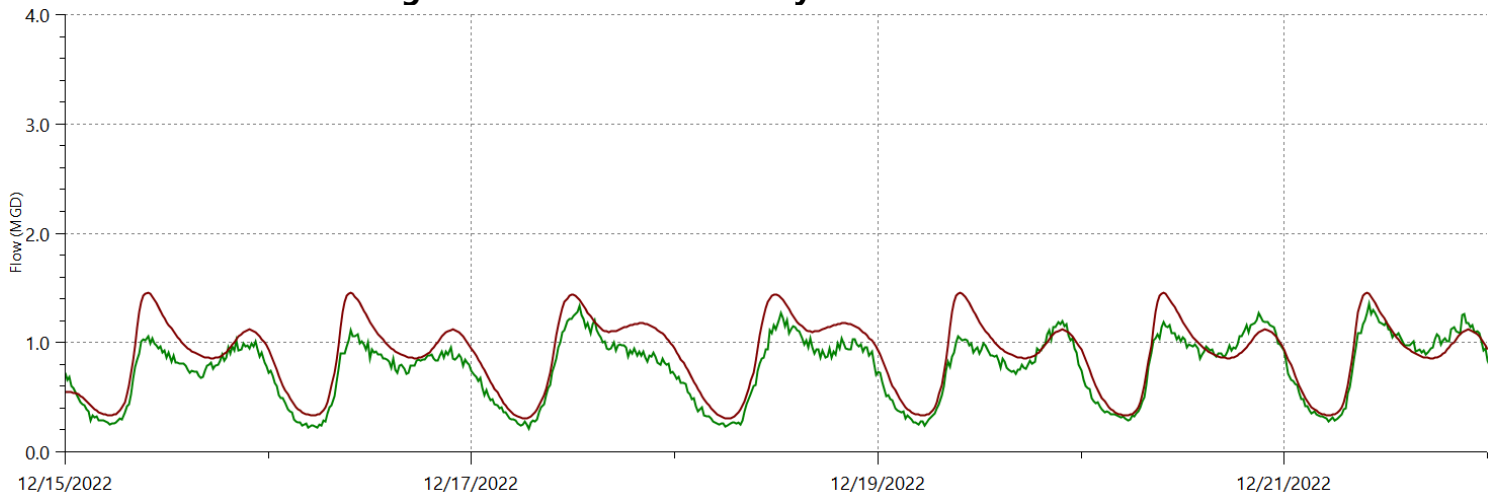


Figure D-6: Flow Meter 5 Dry Weather Calibration

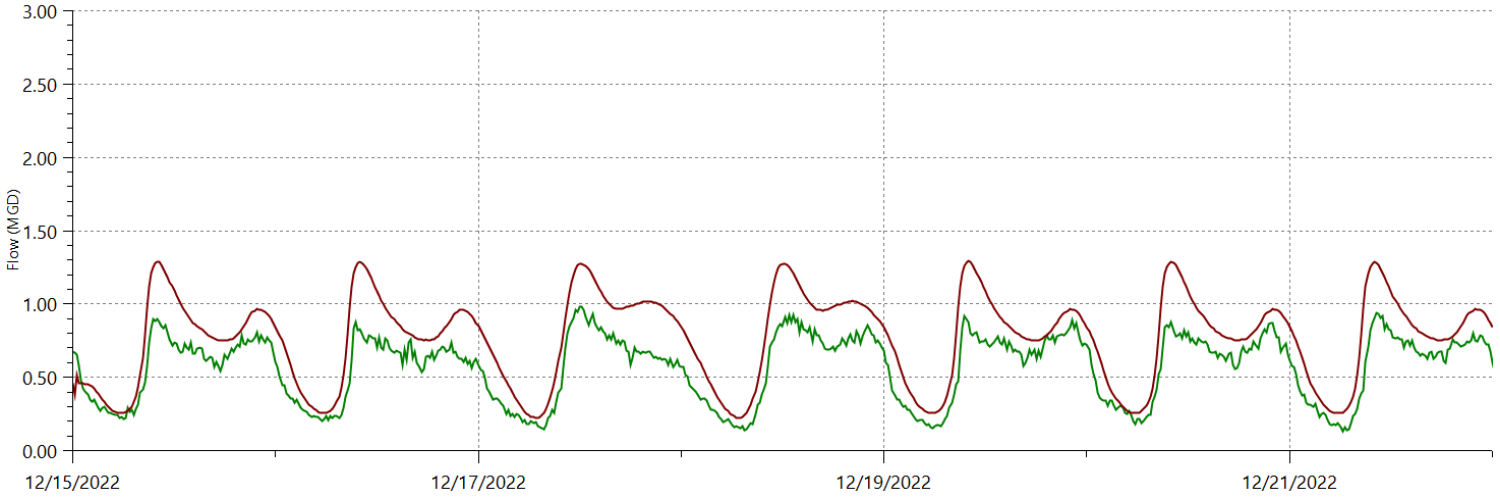


Figure D-7: Flow Meter 6 Dry Weather Calibration

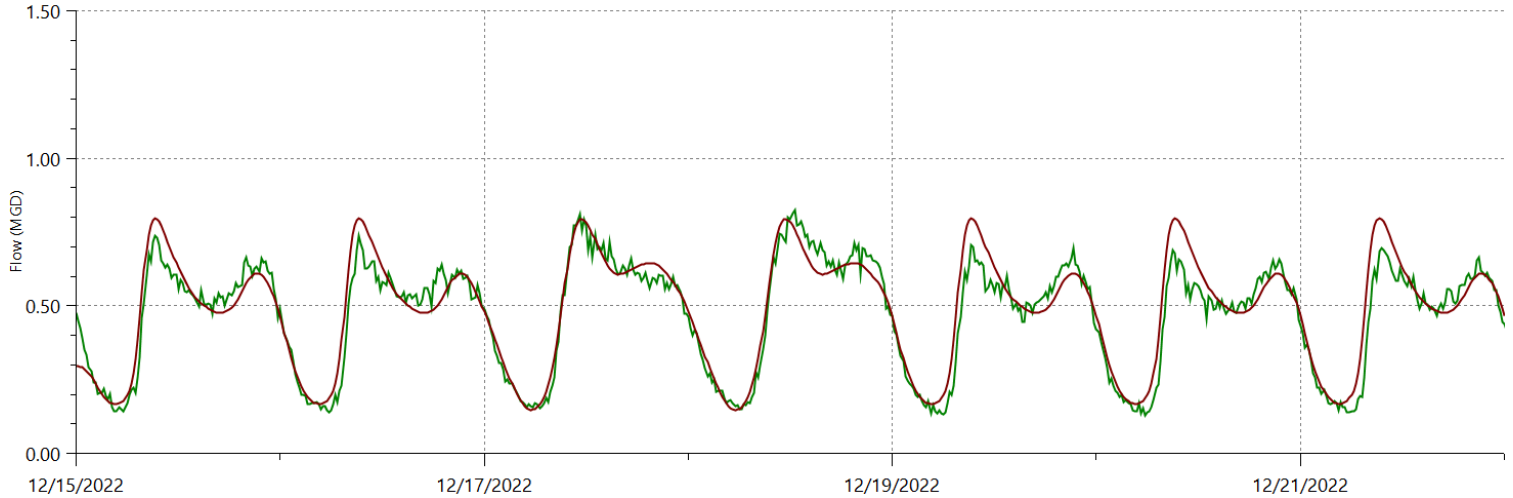


Figure D-8: Flow Meter 7 Dry Weather Calibration

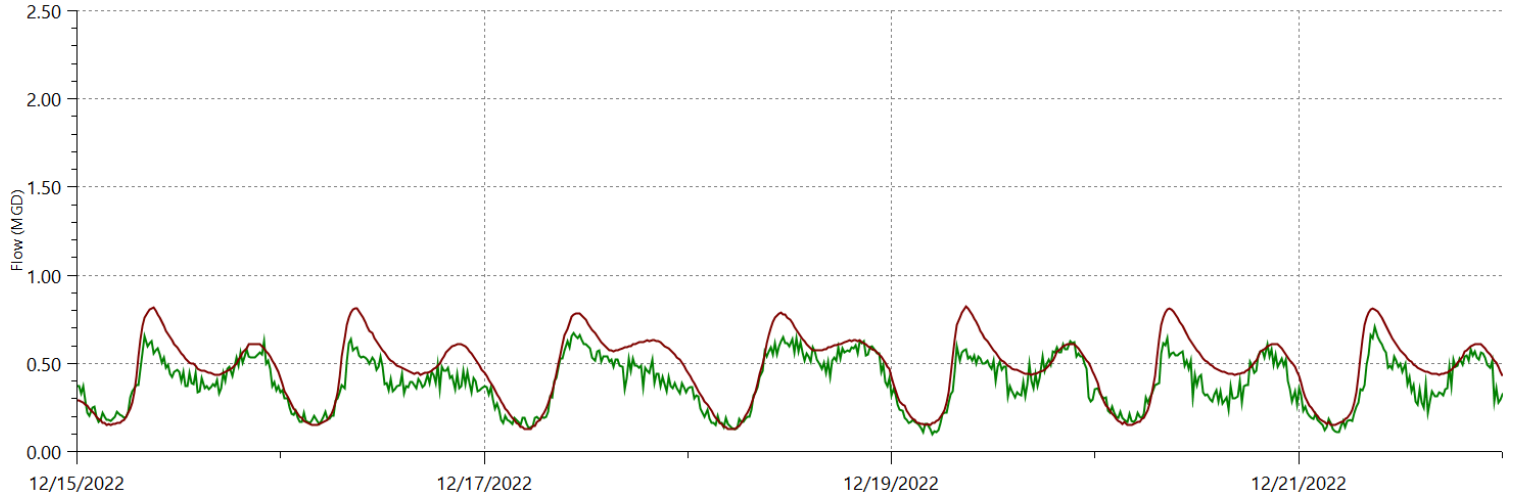


Figure D-9: Flow Meter 8 Dry Weather Calibration

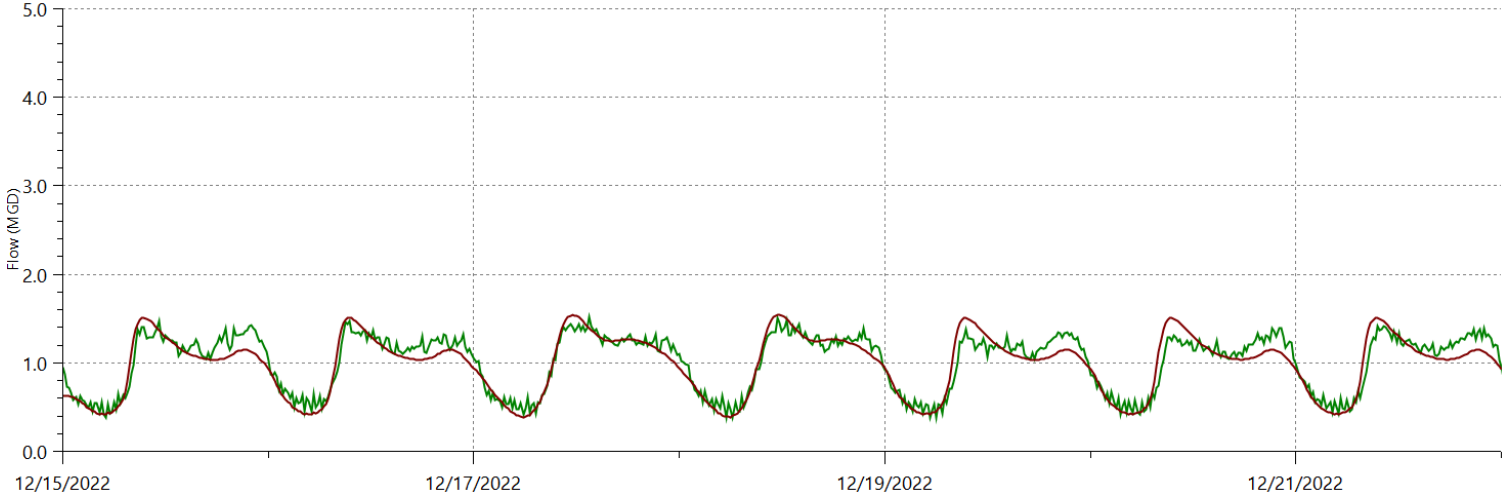


Figure D-10: Flow Meter 9 Dry Weather Calibration

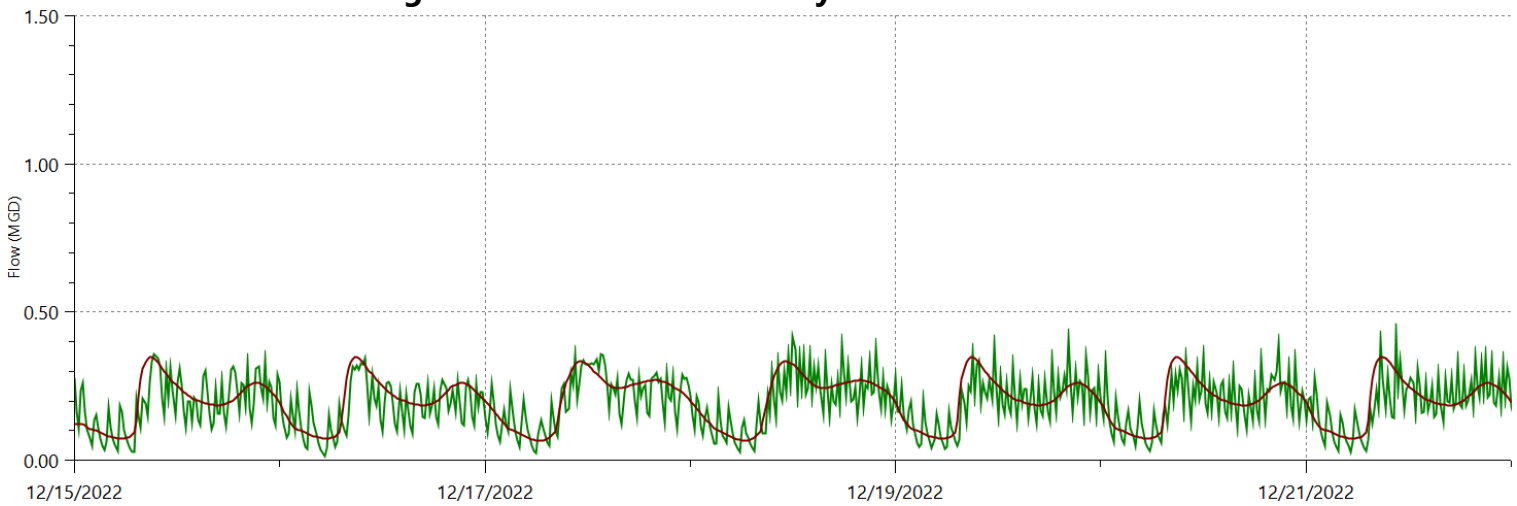


Figure D-11: Flow Meter 10 Dry Weather Calibration

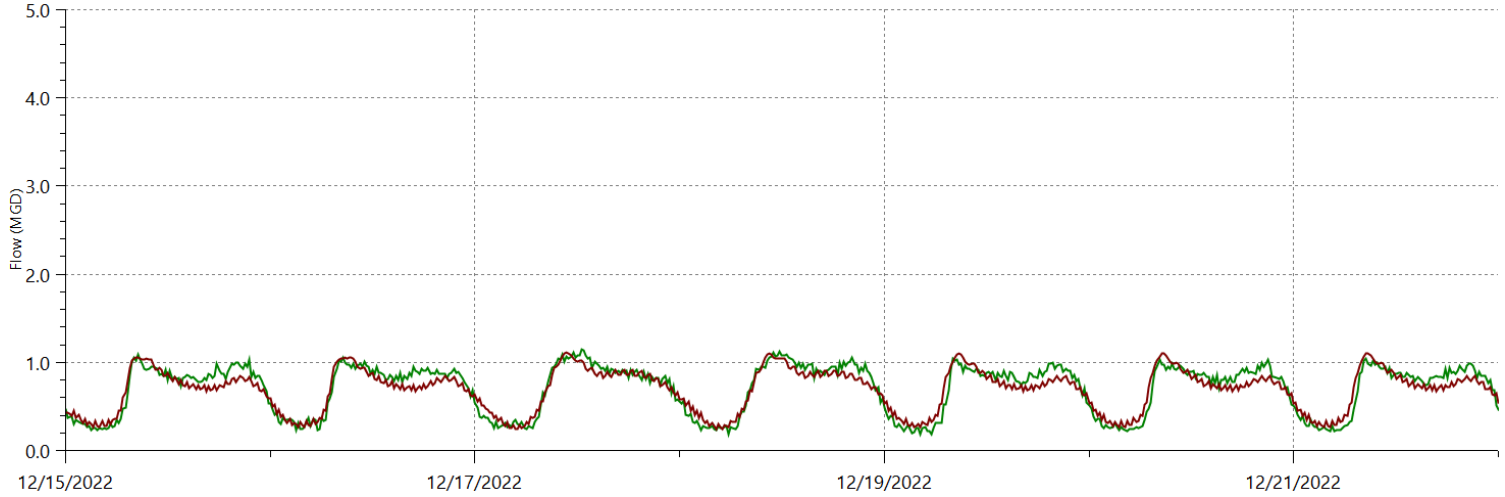


Figure D-12: Flow Meter 10A Dry Weather Calibration

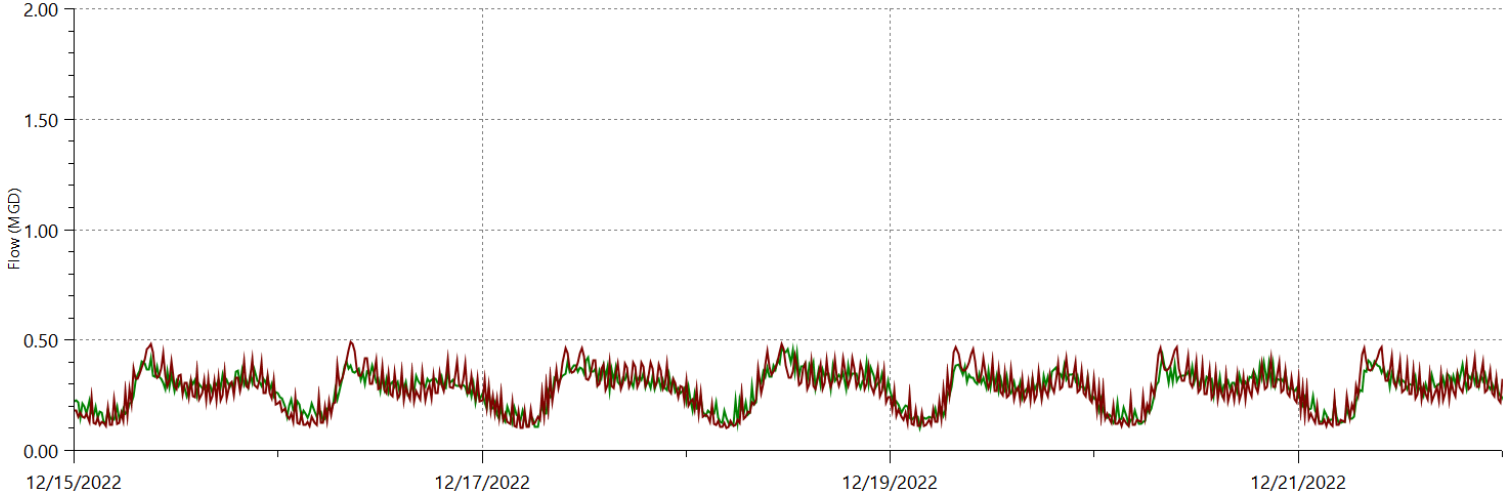


Figure D-13: Flow Meter 11 Dry Weather Calibration

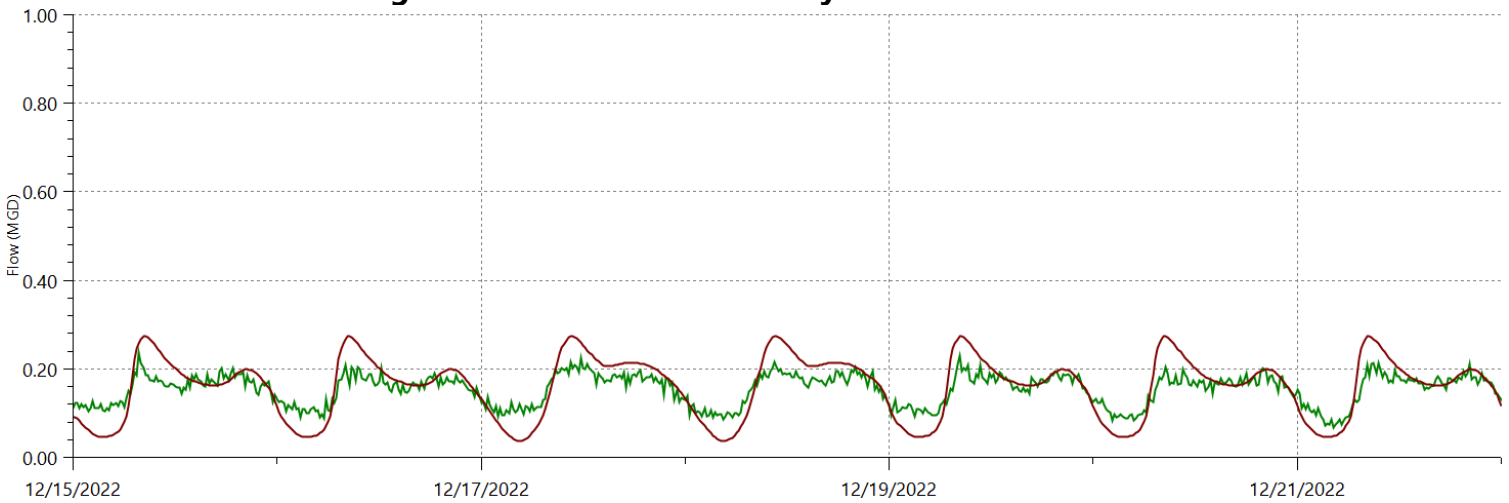
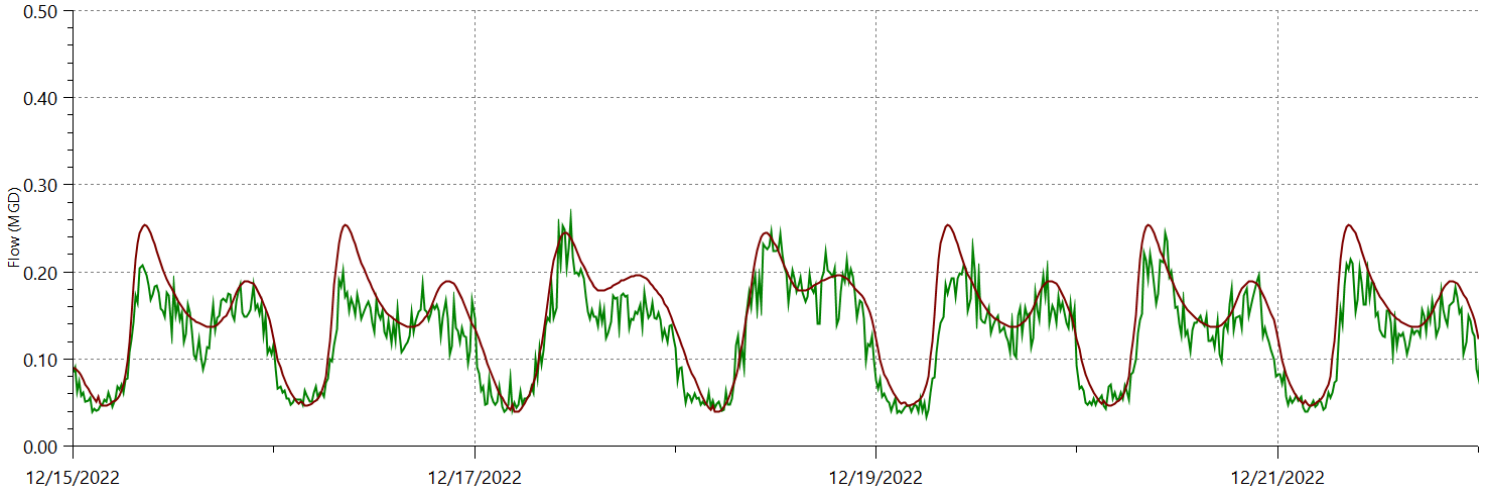


Figure D-14: Flow Meter 12 Dry Weather Calibration



APPENDIX E – WET WEATHER MODEL CALIBRATION GRAPHS

Figure E-1: Flow Meter 1 Wet Weather Calibration

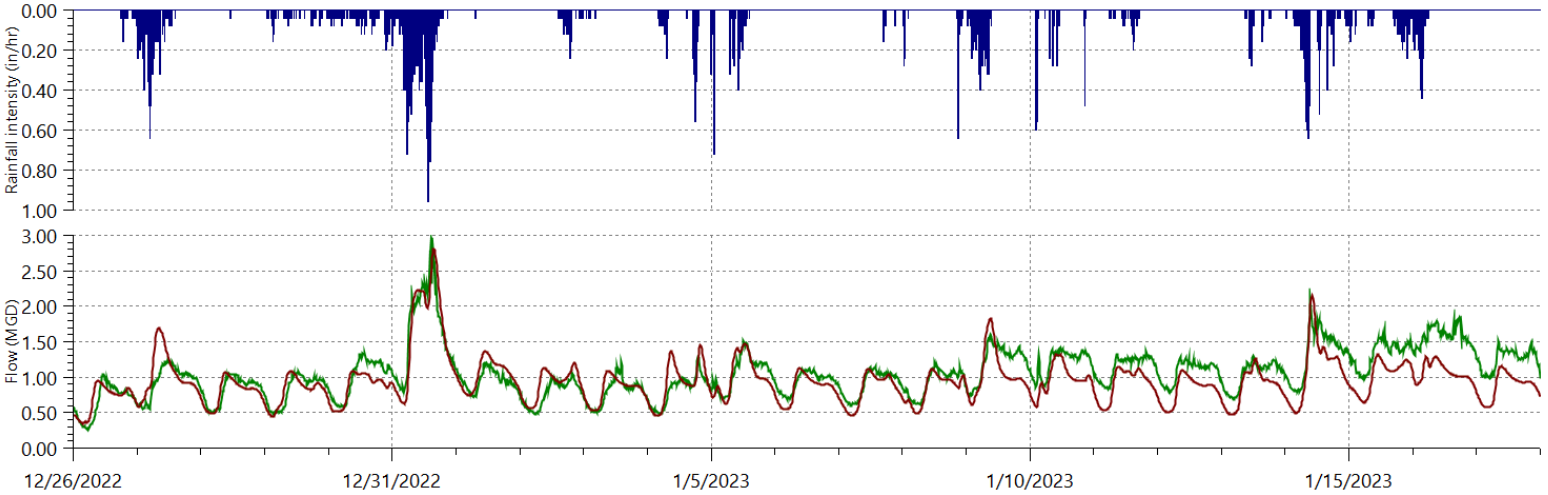


Figure E-2: Flow Meter 2 Wet Weather Calibration

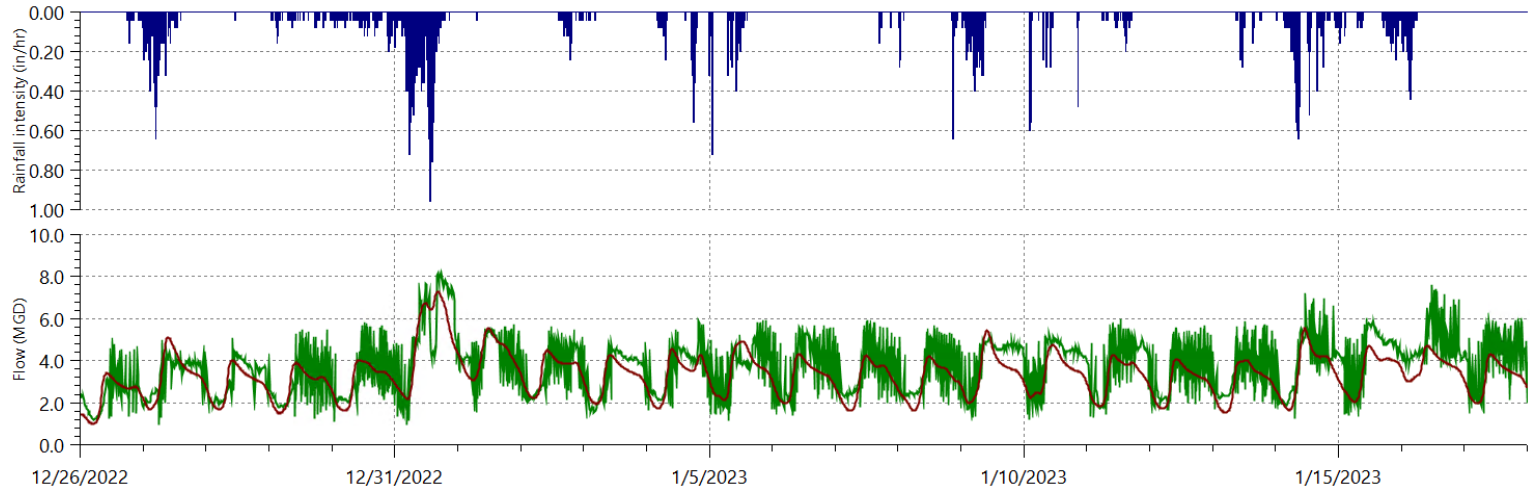


Figure E-3: Flow Meter 3 Wet Weather Calibration

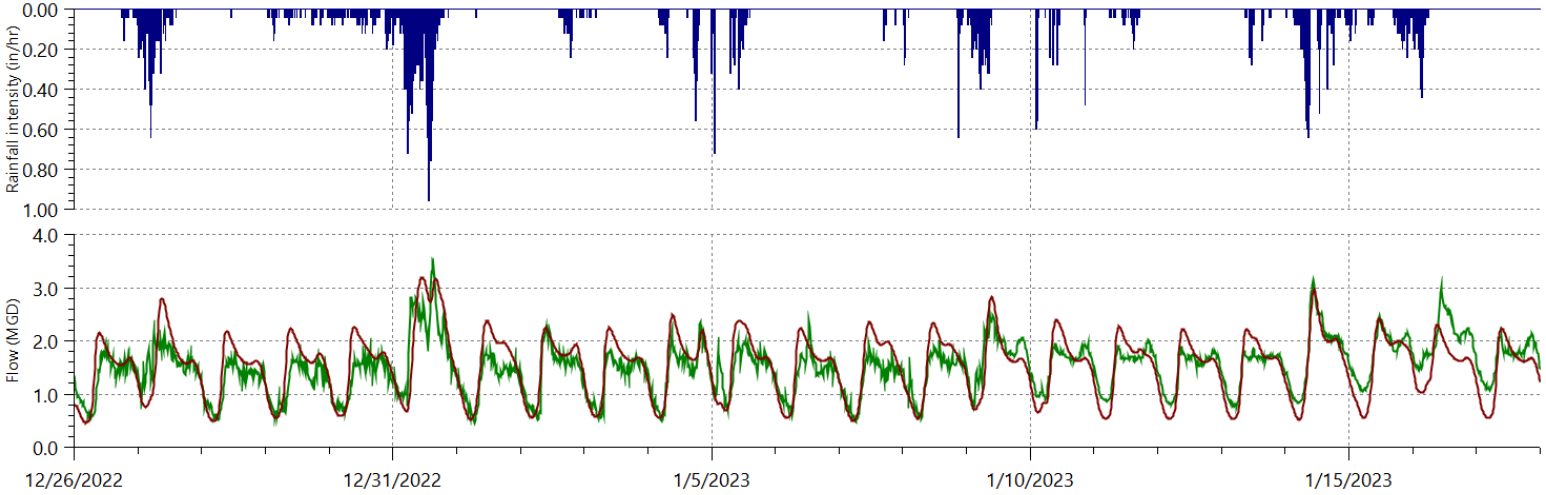


Figure E-4: Flow Meter 3A Wet Weather Calibration

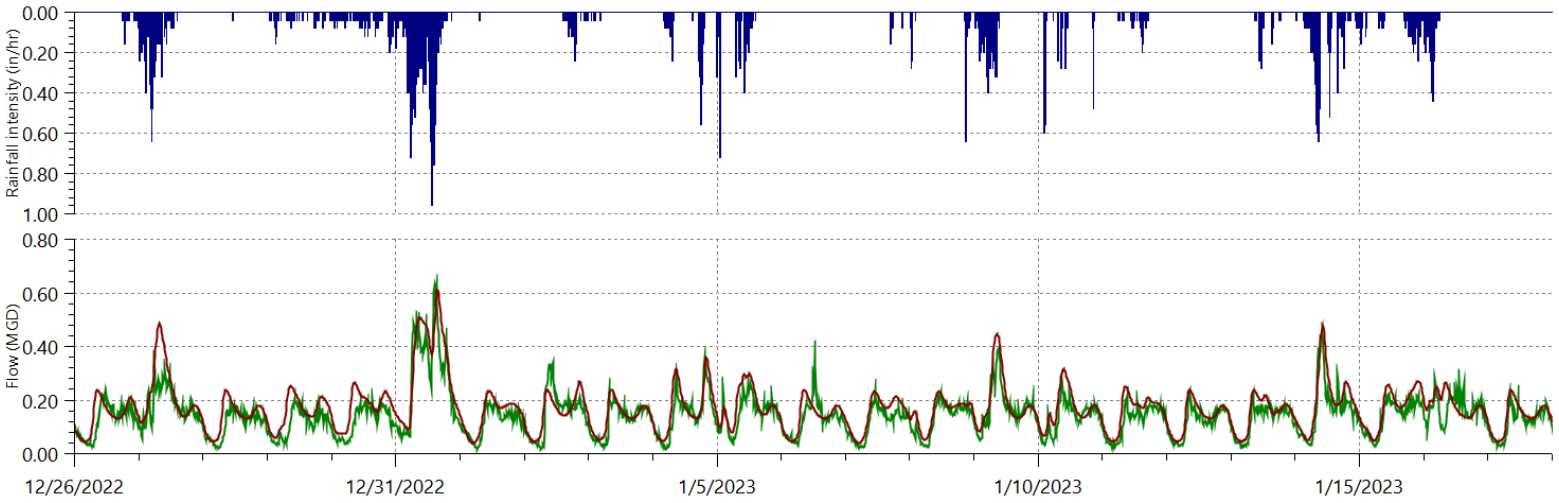


Figure E-5: Flow Meter 4 Wet Weather Calibration

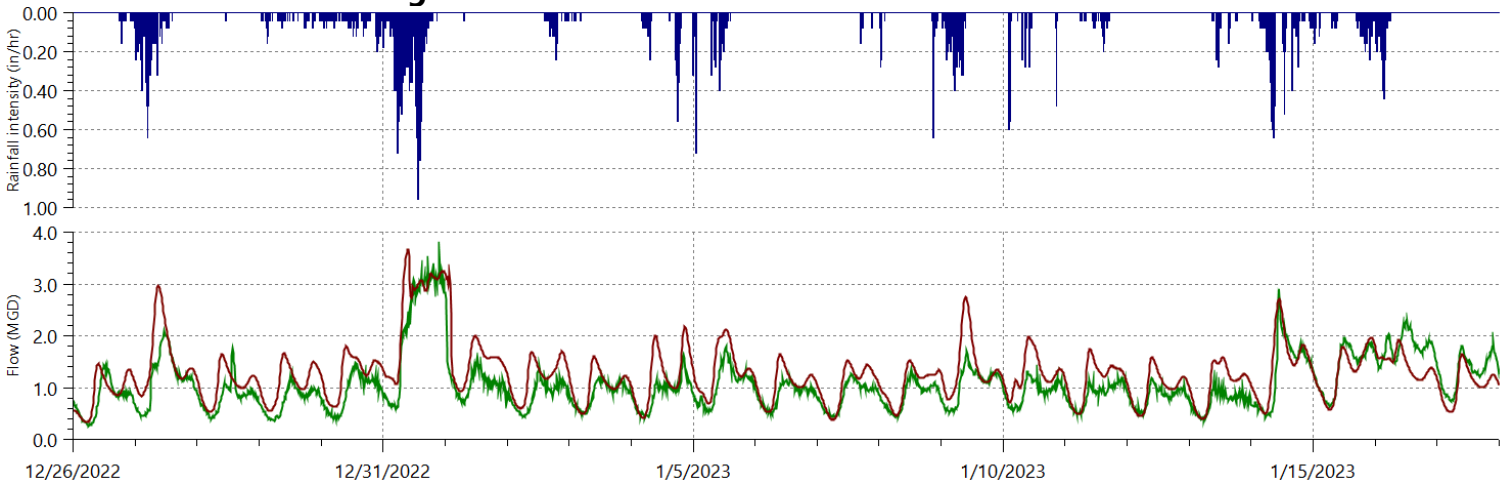


Figure E-6: Flow Meter 5 Wet Weather Calibration

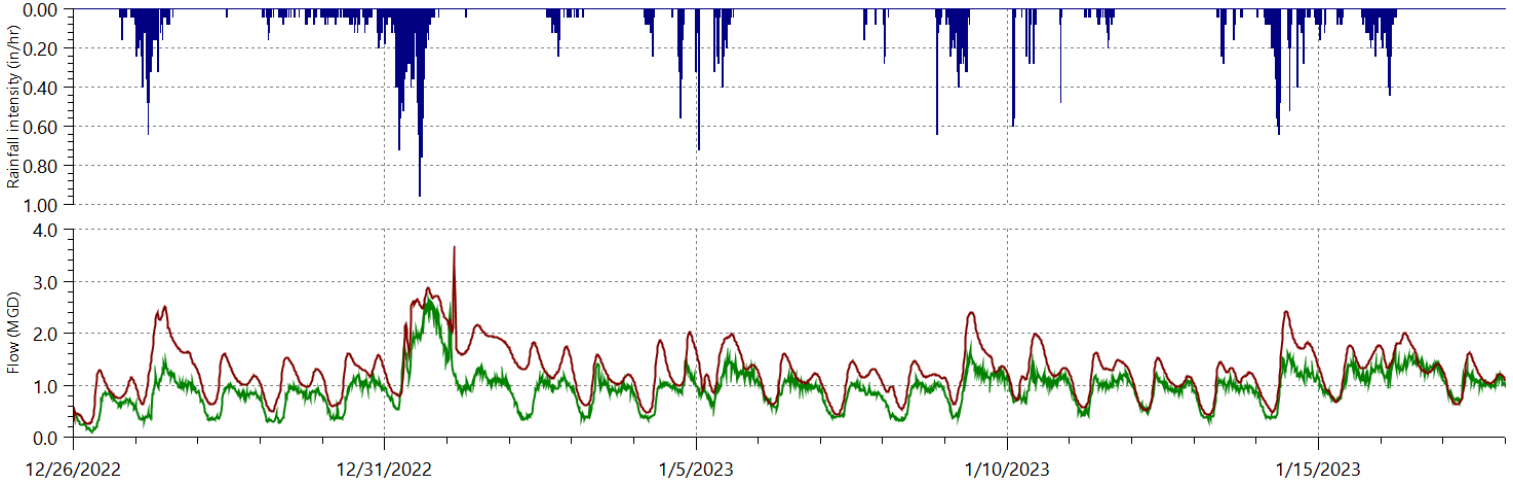


Figure E-7: Flow Meter 6 Wet Weather Calibration

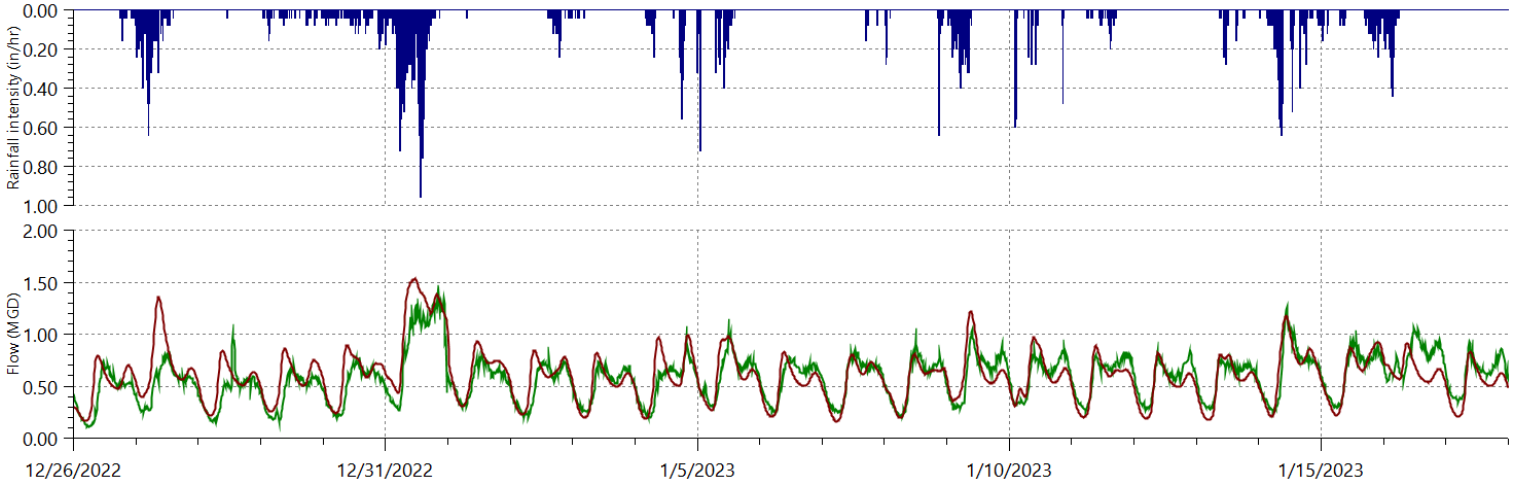


Figure E-8: Flow Meter 7 Wet Weather Calibration

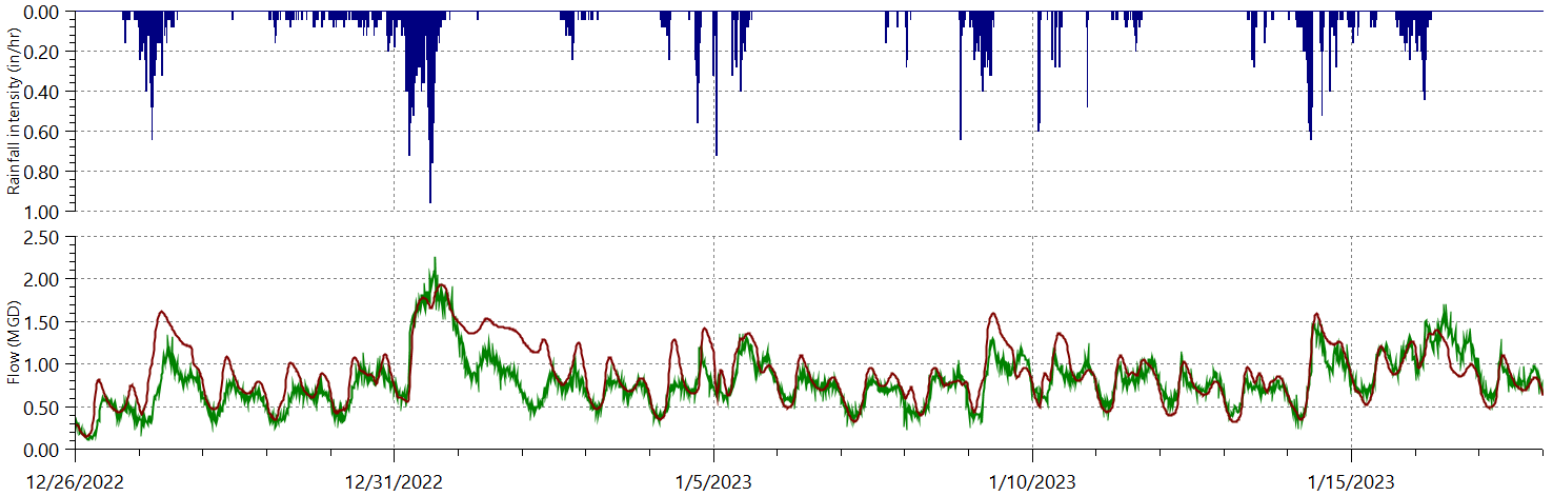


Figure E-9: Flow Meter 8 Wet Weather Calibration Including Depth

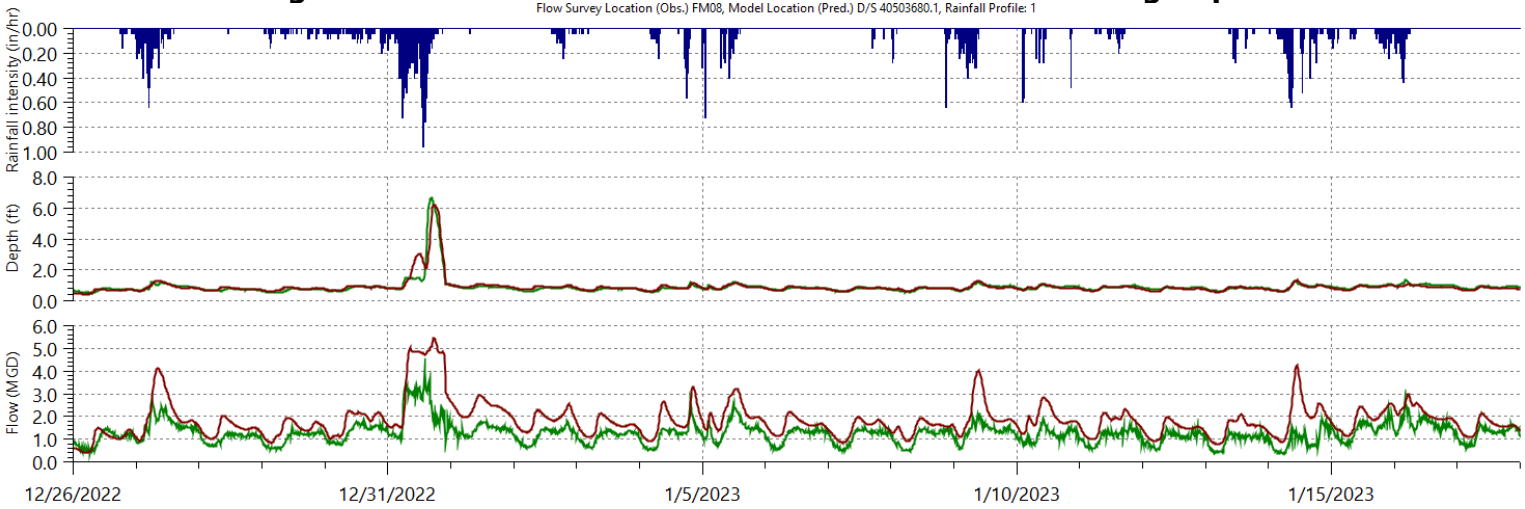


Figure E-10: Flow Meter 9 Wet Weather Calibration

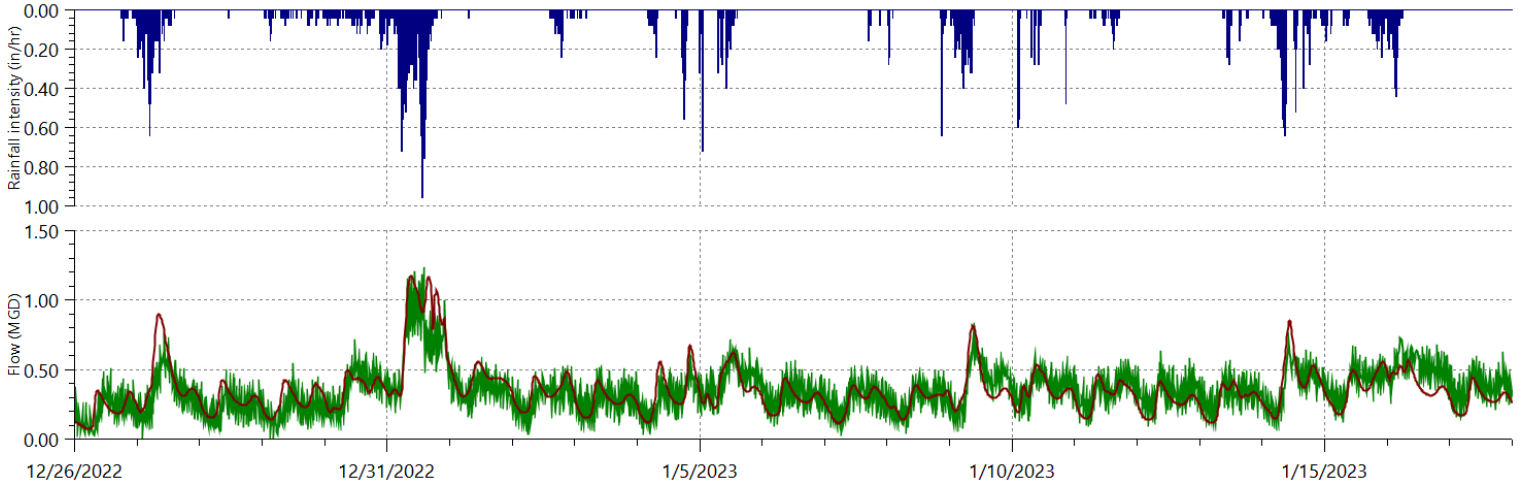


Figure E-11: Flow Meter 10 Wet Weather Calibration

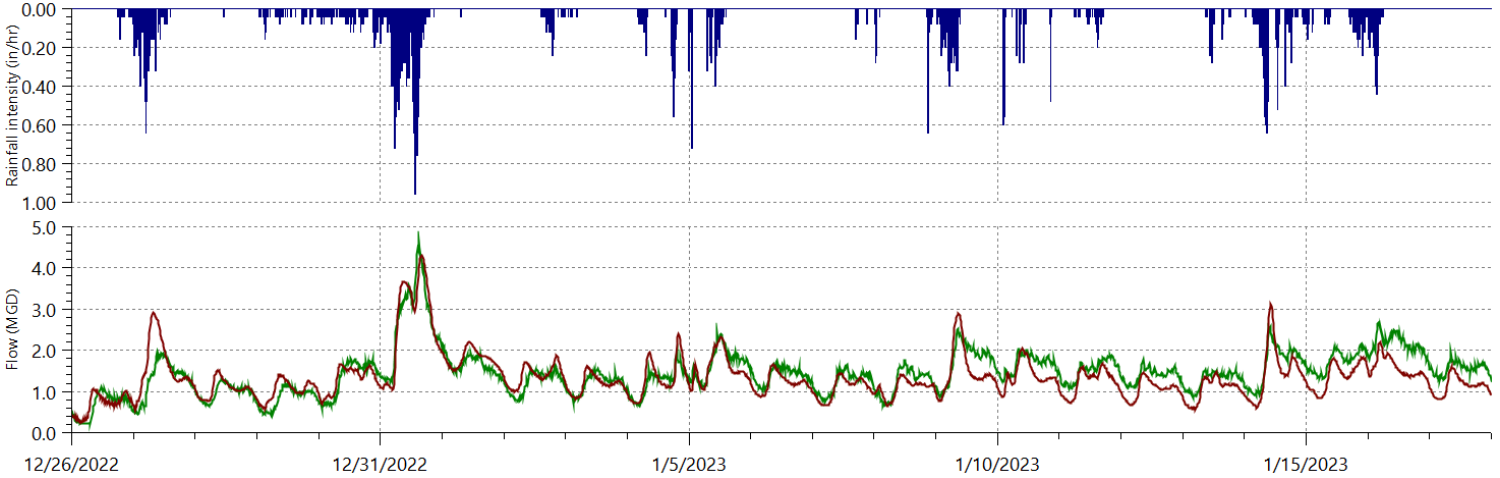


Figure E-12: Flow Meter 10A Wet Weather Calibration

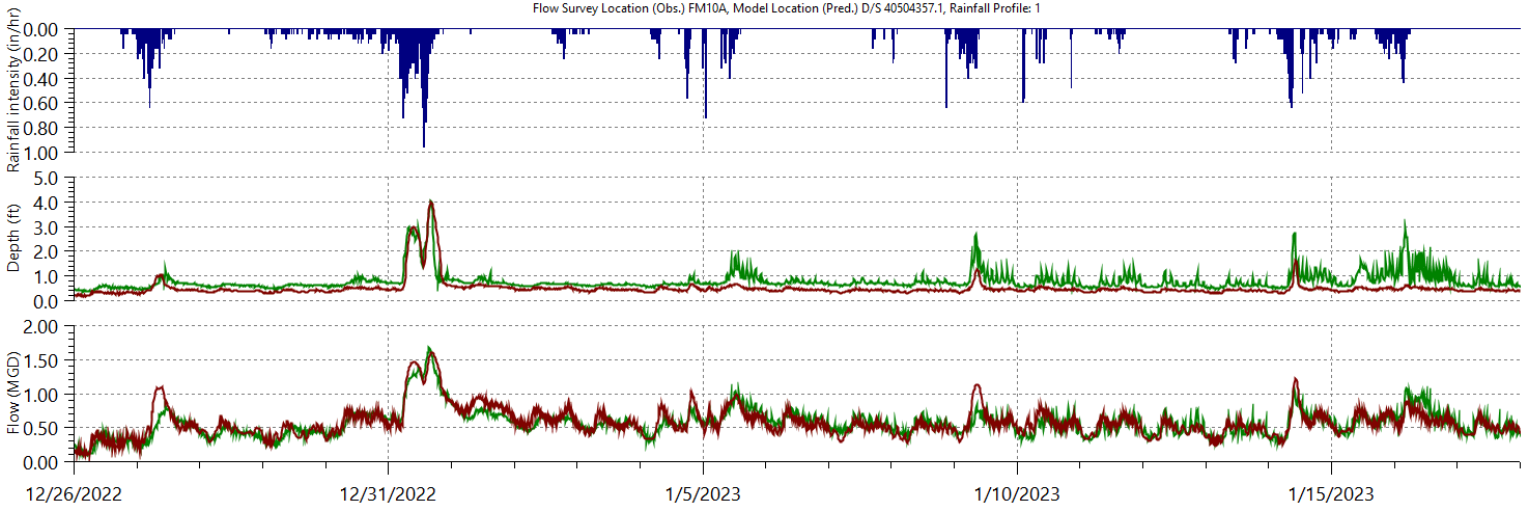


Figure E-13: Flow Meter 11 Wet Weather Calibration

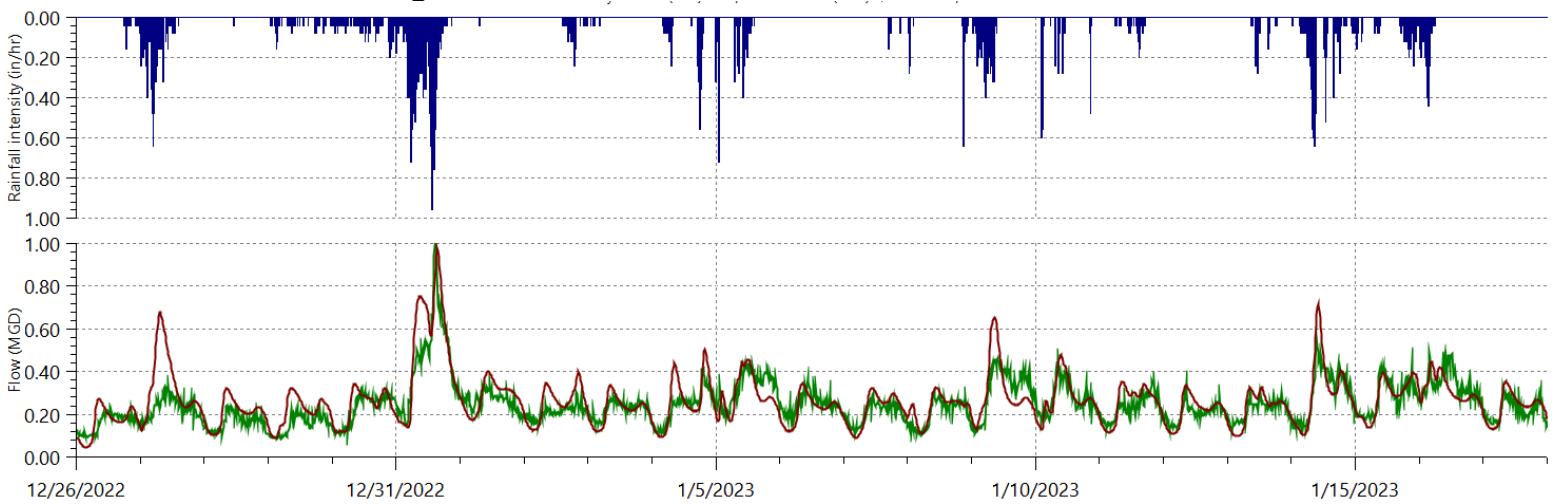


Figure E-14: Flow Meter 12 Wet Weather Calibration

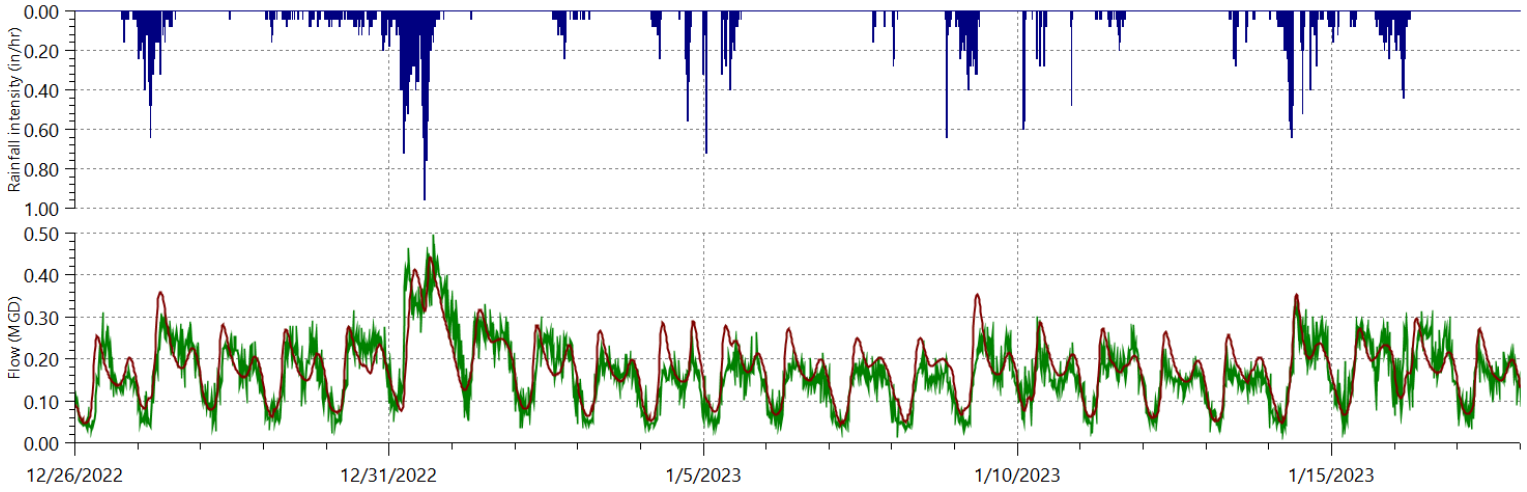
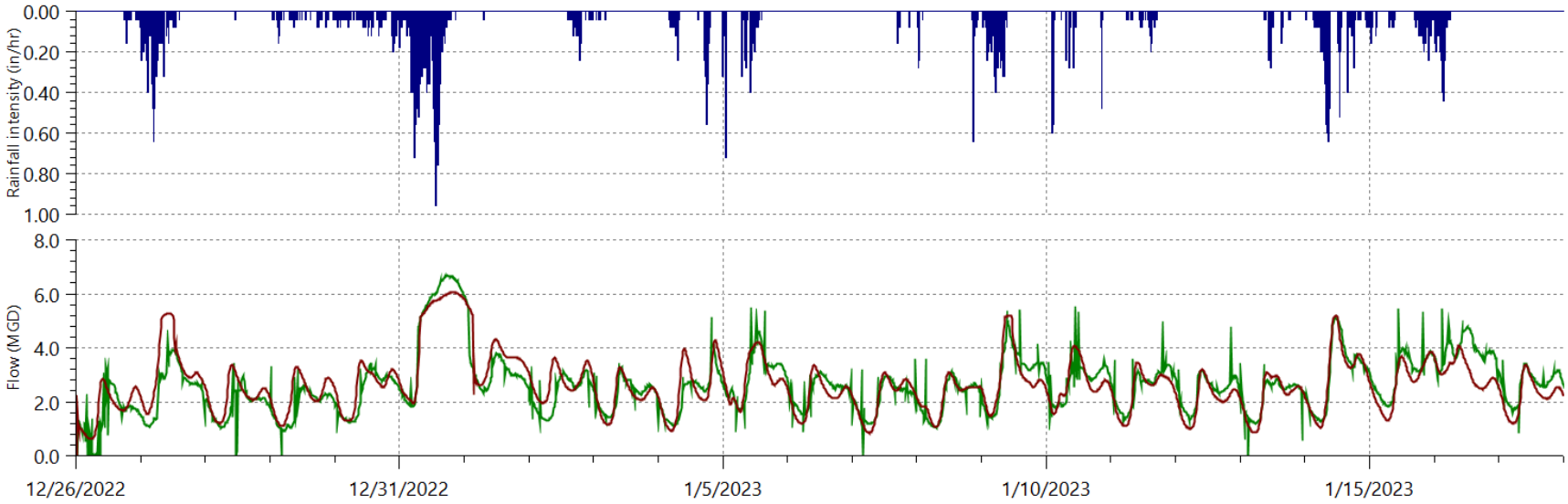
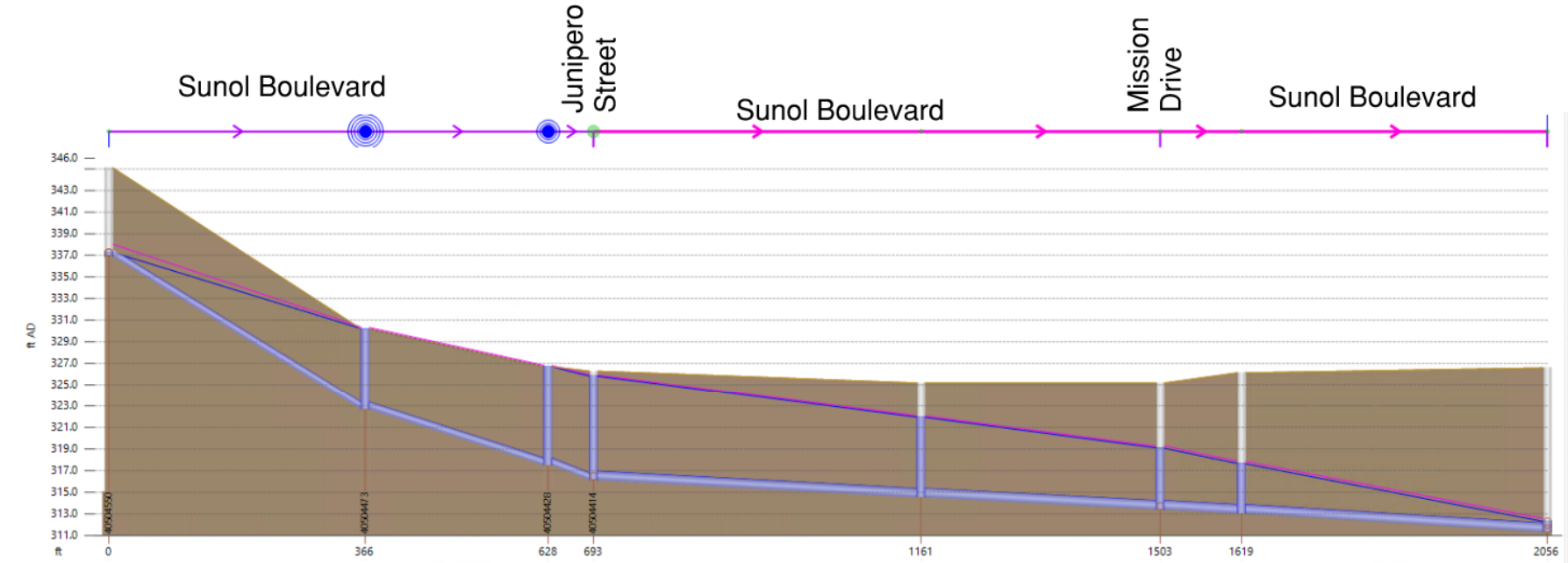


Figure E-15: Lift Station 6 Wet Weather Calibration



APPENDIX F – CAPACITY PROJECT PIPE PROFILES

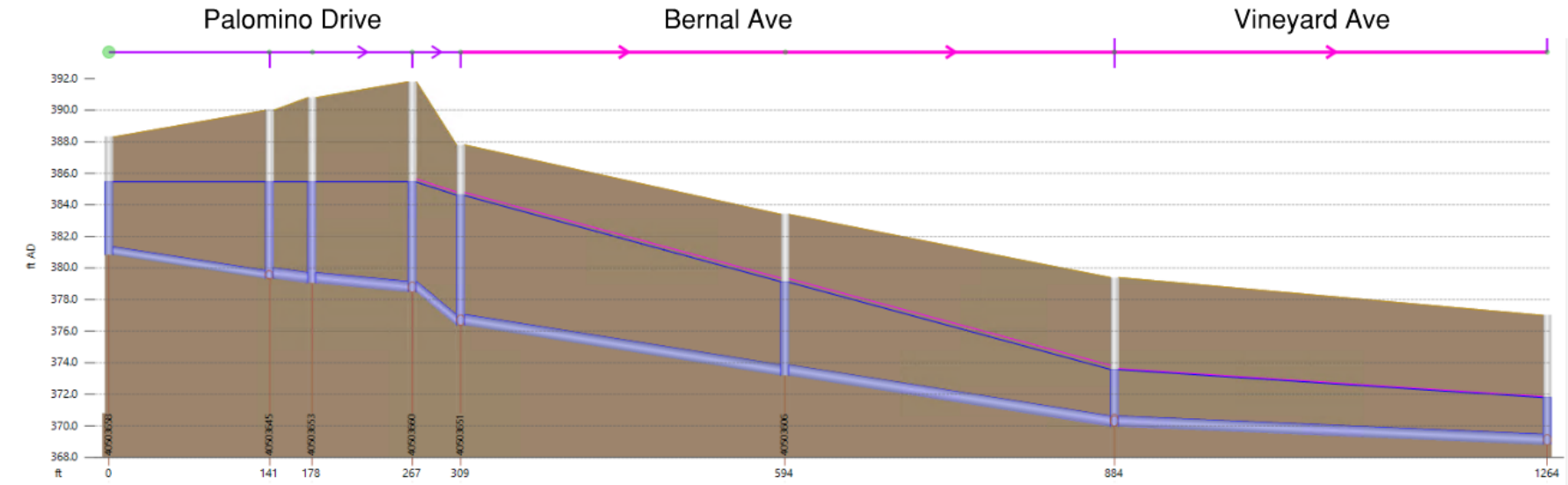
Figure 1: Sunol Boulevard Pipe Profile



Link	40504550.1	40504473.1	-	40504414.1	40504357.1	40504297.1	40504277.1
US node ID	40504550	40504473	-	40504414	40504357	40504297	40504277
ds node	40504473	40504428	-	40504357	40504297	40504277	40504178
length (ft)	366.4	261.5	64.8	468.2	342.0	116.3	437.0
width (in)	8.0	8.0	8.0	10.0	10.0	10.0	10.0
Bot rough M	0.013	0.013	0.013	0.013	0.013	0.013	0.013
us inv (ft AD)	336.900	322.700	317.500	316.130	314.530	313.410	313.040
ds inv (ft AD)	322.700	317.500	316.130	314.530	313.410	313.040	311.330
grad (%)	3.876	1.989	2.114	0.342	0.328	0.318	0.391
pfc (MGD)	1.54	1.10	1.14	0.83	0.81	0.80	0.89

Node	40504550	40504473	40504428	40504414	40504357	40504297	40504277	40504178
ground (ft AD)	345.100	330.200	326.700	326.300	325.200	325.200	326.150	326.600
flood dep (ft)	-7.806	-0.000	0.000	-0.469	-3.240	-6.088	-8.483	-14.297

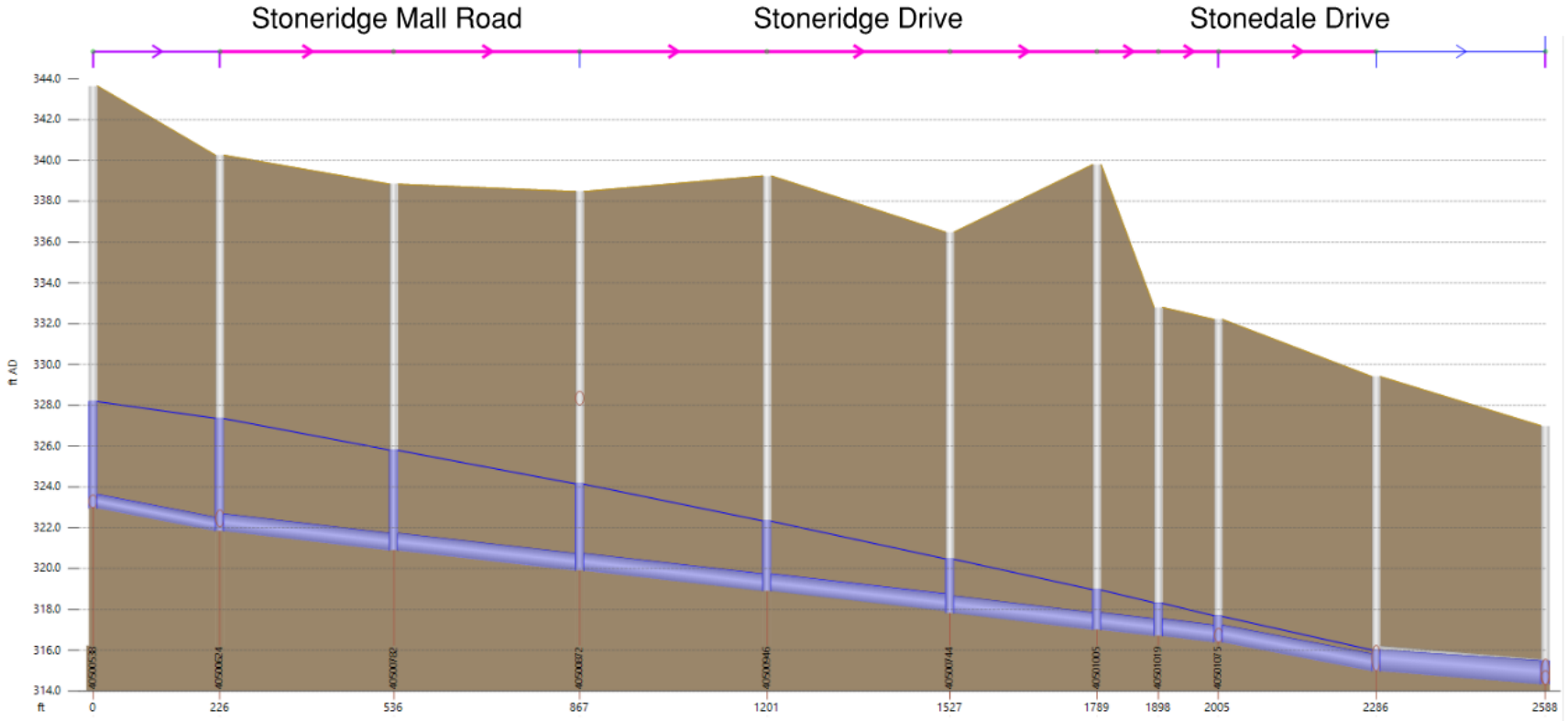
Figure 2: Bernal Avenue, Vineyard Avenue, and Palomino Drive



Link	40503658.1	-	40503653.1	-	40503651.1	40503606.1	40503548.2
US node ID	40503658	-	40503653	-	40503651	40503606	40503548
ds node	40503645	-	40503660	-	40503606	40503548	40503543
length (ft)	141.3	37.1	88.3	42.4	285.1	289.9	380.2
width (in)	6.0	8.0	8.0	8.0	8.0	8.0	8.0
Bot rough M	0.013	0.013	0.013	0.013	0.013	0.013	0.013
us inv (ft AD)	380.840	-	379.040	378.480	376.380	373.190	369.950
ds inv (ft AD)	379.340	-	378.480	376.360	373.190	369.950	368.800
grad (%)	1.061	0.808	0.634	5.000	1.119	1.118	0.302
pfc (MGD)	0.37	0.70	0.62	1.75	0.83	0.83	0.43

Node	40503658	40503645	40503653	40503660	40503651	40503606	40503548	40503543
ground (ft AD)	388.300	390.000	390.800	391.803	387.800	383.400	379.400	377.000
flood dep (ft)	-2.832	-4.534	-5.334	-6.338	-3.180	-4.270	-5.831	-5.209

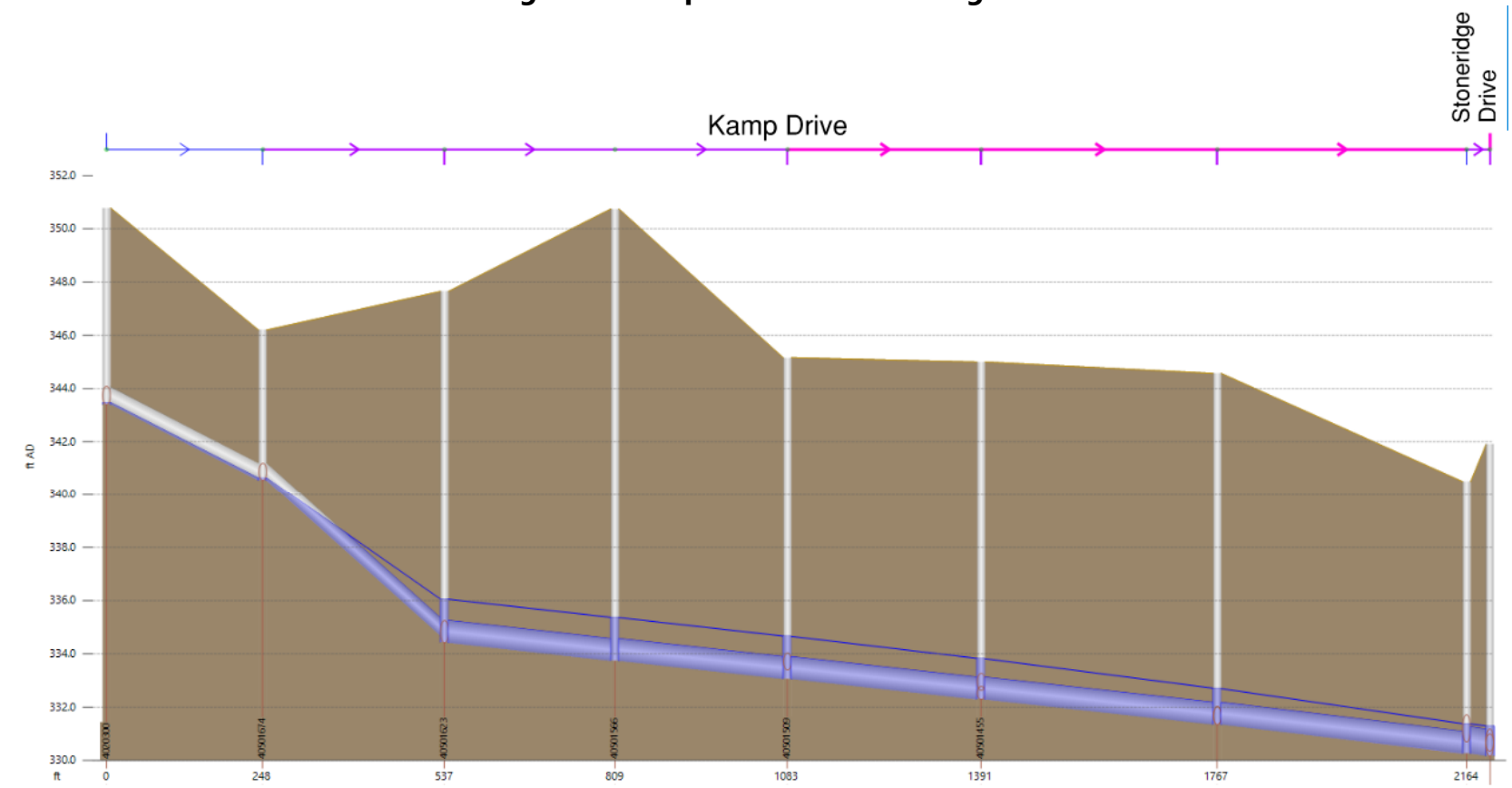
Figure 3: Stoneridge Mall



Link	40500538.1	40500624.1	40500782.1	40500872.1	40500946.1	40500744.1	-	-	40501075.1	40501119.1
US node ID	40500538	40500624	40500782	40500872	40500946	40500744	40501005	40501019	40501075	40501119
ds node	40500624	40500782	40500872	40500946	40500744	40501005	40501019	40501075	40501119	40501151
Asset ID	40805077	40802675	40804122	40804229	40805629	40805059	40806844	40806839	40804168	40804351
width (in)	8.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	15.0
r.pfc (MGD)	0.55	0.78	0.77	0.78	0.78	0.79	0.74	0.76	1.00	1.94
surc	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.92

Node	40500538	40500624	40500782	40500872	40500946	40500744	40501005	-	40501075	40501119	40501151
Asset ID	-	SA2D1M101	SA2D1M205	SA2D1M404	SA2D3M101	SA2D3M203	SA2D4M200	-	SA2D4M301	SA2D4M405	SA2D4M503
ground (ft AD)	343.648	340.260	338.840	338.480	339.240	336.490	339.800	332.800	332.210	329.410	327.000
flood dep (ft)	-15.461	-12.899	-13.034	-14.331	-16.906	-16.017	-20.836	-14.479	-14.525	-13.403	-11.522

Figure 4: Kamp Drive and Stoneridge Drive



Link	4020300.1	40501674.1	40501623.1	40501566.1	40501509.1	40501455.1	40501373.1	-
US node ID	4020300	40501674	40501623	40501566	40501509	40501455	40501373	-
ds node	40501674	40501623	40501566	40501509	40501455	40501373	40501239	-
Asset ID	40804541	40805249	40806293	40806605	40806149	40805507	40805303	-
width (in)	8.0	8.0	10.0	10.0	10.0	10.0	10.0	-
r.pfc (MGD)	0.84	1.11	0.71	0.71	0.71	0.71	0.74	-
surc	0.13	1.00	1.00	1.00	2.00	2.00	2.00	-

Node	4020300	40501674	40501623	40501566	40501509	40501455	40501373	40501239
Asset ID	SD3C2J106	SD3A4M503	SD3A4M405	SD3A4M206	SD3A4M103	SD3A2M400	SD3A2M301	SD3A2M102
ground (ft AD)	350.784	346.200	347.650	350.750	345.160	345.000	344.570	340.500
flood dep (ft)	-7.317	-5.571	-11.587	-15.375	-10.489	-11.166	-11.857	-9.118

APPENDIX G – IMPROVEMENTS IDENTIFIED IN 2007 WASTEWATER MASTER PLAN

Appendix G: 2007 Capacity Results Compared to 2024 Model Results

2007 CIP Project Number	Project Description	2007 Model Priority	2007 Model Results	2024 Capacity Project	2024 Model Results and Comments
Project 1A	Project 1A consists of replacing 522 feet of pipeline upstream of the dual 8-inch siphons crossing the Arroyo Mocho Canal. The existing 10 and 12-inch pipelines should be replaced with a 15-inch pipeline. Project 1A is estimated to cost $185,000.	Near-Term	The model predicts overflows upstream of this project, and significant surcharge downstream of the East Pleasanton area.	Capacity Project 4	The model shows a slight surcharge (10+ feet of freeboard) upstream of the existing double barrel 8-in siphon under future loading conditions. A project in this area is required because this surcharge is caused by future development, and no backup surcharge occurs under existing conditions. See Capacity Project 4 for details.
Project 1B	Project 1B consists of replacing 2,120 feet of pipeline along First Street from Bernal Avenue to Arendt Way. The existing 6 and 10-inch pipelines should be replaced with a 12-inch pipeline. in two reaches. Reach 1 involves replacing 204 feet of existing 10-inch pipeline along Sunol Boulevard between Monaco Drive and Bernal Avenue with a new 12-inch pipeline. Reach 2 involves replacing 2,123 feet of existing 6-inch and 10-inch pipeline along First Street between Bernal Avenue and Arendt Way with a new 12-inch pipeline. Project 1B is estimated to cost $715,000.	Near-Term	The model predicts surcharge and overflows along the existing pipeline. It also predicts backup surcharge upstream of this pipeline.	None	This section of pipe was modeled as 6-inch, 8-inch, and 10-inch in the 2007 Master Plan. According to the latest City GIS, this section of pipe was installed as a 12-inch originally. The modeled 12-inch section of pipe does not predict any surcharge on First Street between Abbie Street and Arendt Way. The model shows some surcharge at the intersection of Bernal Ave and 1st street. However, upstream of this point, the model predicts no surcharge. No project is needed based on pipe freeboard (6.5 ft).
Project 1C	LS-6 is an old pump station with capacity problems under dry weather flow conditions. A recent site inspection revealed the existing structure to be in poor condition. Pump Station S-6 is currently at capacity and should be upgraded from 4.0 mgd to a 6.9 mgd pump station. The existing facility cannot accommodate this upgrade. The existing building, wet well, and dry well are all too small to accommodate the new equipment. In order to increase the capacity at this station it is recommended that a new facility be constructed adjacent to the existing pump station. Construction for this project is estimated to take a year and during that time the existing pump station would remain in service. Project 1C is estimated to cost $4,125,000.	Near-Term	The model predicts extensive backup from LS-6 station.	Project has already been implemented	LS-6 has been substantially reconstructed since the 2007 Master Plan. The model shows significant backup surcharge at LS-6. However, under the future model load scenario, no project is needed based on the remaining freeboard in the downstream pipes.
Project 1D	Project 1D involves the construction of a new EARS pump station. In conjunction with Project 1E, the improvements will results in the activation of the EARS line. The new EARS PS will replace the existing EALS which is under capacity. It is recommended that the new pump station have a firm capacity of 7.6 mgd. Project 1D is estimated to cost $4,950,000.	Near-Term	The model predicts that EALS is undersized and should be replaced.	No	Due to limited available data, capacity of EALS lift station has not been evaluated EALS did show surcharge to within 8ft of the manhole rim during the 2022 rainfall event (approximately equivalent to the 25-year design storm). Based on this result, EALS may need to be upsized to have enough capacity for future developments in the East Pleasanton Area. Based on the modeled future conditions, it does not appear that

2007 CIP Project Number	Project Description	2007 Model Priority	2007 Model Results	2024 Capacity Project	2024 Model Results and Comments
Project 1E	Project 1E will connect the new EARS PS (Project 1D) with the existing system. An 800-foot, 30-inch diameter gravity pipeline will convey flows from the existing EALS to the new EARS PS. In addition, an 800-foot, 18-inch forcemain from the EARS PS will then carry the flow back to the existing manhole where flows will continue by gravity to the WWTP. Project 1E is estimated to cost $969,000.	Near-Term			using the EARS line and building a new pump station is a cost-effective means to convey flow to the DSRSD treatment plant, based on the existing sewer routing, and modeled results. If the EALS PS has significant site constraints and cannot be upgraded to accommodate future flows, a new EARS PS could be considered as an alternative. See **Section 6.4.3** for further discussion.
Project 2A	Project 2A consists of a new 850-foot, 8-inch pipeline that will bypass the existing Stoneridge Mall sewer. The new pipeline will be constructed along the eastern portion of Stoneridge Mall Road from Canyon Way to near Deodar Way. Project 2A is estimated to cost $236,000.	Medium-Term	The model predicts freeboard >3ft	Partially Implemented. One section of pipe in this area was installed in 2014.	One section of pipe in this area was replaced installed in 2014. If sufficient backup occurred, flow would back up and spill over the summit manhole SA2A4M300 and into the relief sewer on the West side of the Mall. No new pipeline to the East of Stoneridge Mall is needed based on current future load projections. Surcharge occurs in the sewer further upstream and further downstream of this location, but there is no benefit to upsizing this section of sewer based on current model future loads. A pipeline is required downstream of Stoneridge Mall based on the proposed future developments (see Capacity Project 3).
Project 2B	Project 2B consists of re-routing an existing 8-inch pipeline to accommodate a Nordstrom expansion at Stoneridge Mall. The existing pipeline alignment is just outside the current mall building. The proposed new 8-inch pipeline alignment will extend further east, almost to Stoneridge Mall Road. Project 2B is estimated to cost $237,000.	Medium-Term	The model predicts freeboard >3ft	Not needed at this location (see Capacity Project 3 downstream)	Due to changes in the projected developments at Stoneridge Mall, these sewers are not identified as a deficiency. However, Capacity Project 3 has been identified to address downstream capacity deficiencies.
Project 2C	Project 2C consists of replacing 855 feet of existing 8-inch pipeline along Kamp Drive between Maple Leaf Drive and Begonia Court with a new 10-inch pipeline. This reach of pipeline is not capacity limited. However, upstream and downstream reaches are 10-inch pipelines. Replacing the 8-inch pipeline will result in better maintenance of the line. Project 2C is estimated to cost $265,000.	Medium-Term	Modeled overflow predicted	Capacity Project 4	

2007 CIP Project Number	Project Description	2007 Model Priority	2007 Model Results	2024 Capacity Project	2024 Model Results and Comments
Project 2D	Project 2D is a resulting project from the Vineyard Sewer Master Plan. A new 3,972-foot, 18-inch pipeline will be constructed to provide relief in the Vineyard area. The pipeline is proposed from Bernal and Vineyard Avenues to Nevada Street and along Nevada Street to First Street near Downtown. Project 2D is estimated to cost $1,500,000.	Medium-Term	The model predicts freeboard of 1ft to 3ft	Capacity Project 2	This area shows significant modeled surcharge under existing design storm conditions, reaching within 3ft of the manhole rim. See Capacity Project 2 for more details.
Project 3A	Project 3A consists of replacing 5,333 feet of pipeline along Sunol Boulevard in three reaches. Reach 1 involves replacing 3,031 feet of existing 8-inch and 10-inch pipeline along Sunol Boulevard from Arlington Drive to Junipero Street with a new 12-inch pipeline. Reach 2 involves replacing 1,522 feet of existing 10-inch and 12-inch pipeline along Sunol Boulevard from Junipero Street to Monaco Drive with a new 15-inch pipeline. Reach three involves replacing 780 feet of existing 8-inch pipeline along Junipero Street between Sunol Boulevard and Sonoma Drive with a new 12-inch pipeline. The pipeline improvements are needed for future development upstream. Project 3A is estimated to cost $1,797,000.	Long-Term	Modeled Overflow predicted	Capacity Project 1	The existing and future loads PWWF scenario predicts a modeled overflow on Sunol Boulevard and extensive surcharge. See Capacity Project 1 for more details.
Project 3B	Upgrade Pump Station S-8 from a firm capacity of 4.0 mgd to 5.4 mgd. The upgrades are needed to accommodate future development in upstream basins. Project 3B is estimated to cost $1,650,000.	Long-Term	Model predicts surcharge caused by the lift station	No	The model shows significant backup surcharge at LS-8. However, the backup does not cause freeboard to be less than 3 feet and therefore a capacity project is not required (7+ feet of freeboard is still in the pipe). Note that LS-8 has a diversion structure that automatically diverts flow by gravity LS-6 under surcharged conditions.
Project 3C	Upgrade Pump Station S-7 from a firm capacity of 4.0 mgd to 4.6 mgd. The upgrades are needed to accommodate future development in upstream basins. Project 3C is estimated to cost $1,238,000.	Long-Term	Model predicts surcharge caused by the lift station	No	The model predicts some backup at LS-7. However, the backup does not cause freeboard to be less than 3 feet and therefore a capacity project is not required (10+ feet of freeboard is still in the pipe).

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