

LAVWMA

Prepared by



Dublin San Ramon
Services District

Water, wastewater, recycled water

QUARTERLY REPORT OF OPERATIONS

FY 2023-2024, 1st Quarter



**Quarterly Report of Operations
LAVWMA Pumping and Conveyance System**

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**Quarterly Report of Operations
LAVWMA Pumping and Conveyance System**

QUARTER AT A GLANCE

Export flows increased each month during Q1 FYE 2024 (Figure 1). Flow attributable to the Dublin San Ramon source was 0 each month this quarter.

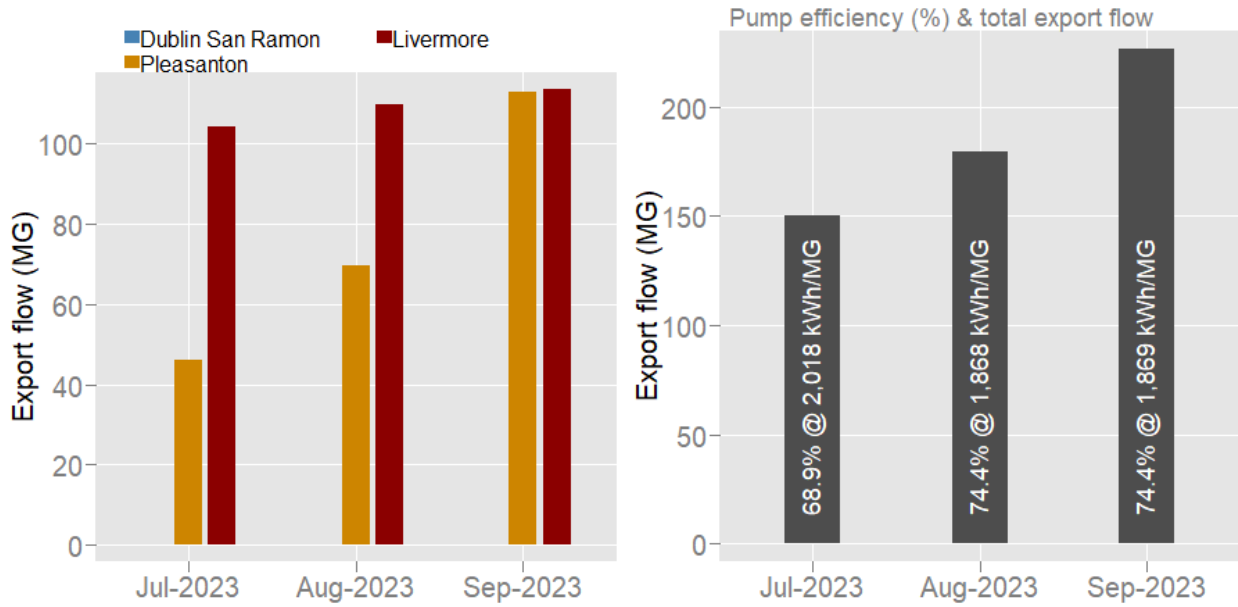


Figure 1 LAVWMA Quarter 1 FYE 2024 export flows for Jul-2023, Aug-2023, & Sep-2023; monthly flows shown by source (left plot) and as total (right plot) with pump efficiency (%) at noted kilowatt hour (kWh) per million gallons (MG)

Most usage for either feeder (service) was done during off-peak hours (Figure 2). There was no reportable usage for Feeder A during Jul-2023. Feeder B provides power to the building, so there will always be minor charges for building equipment during peak and partial peak periods.

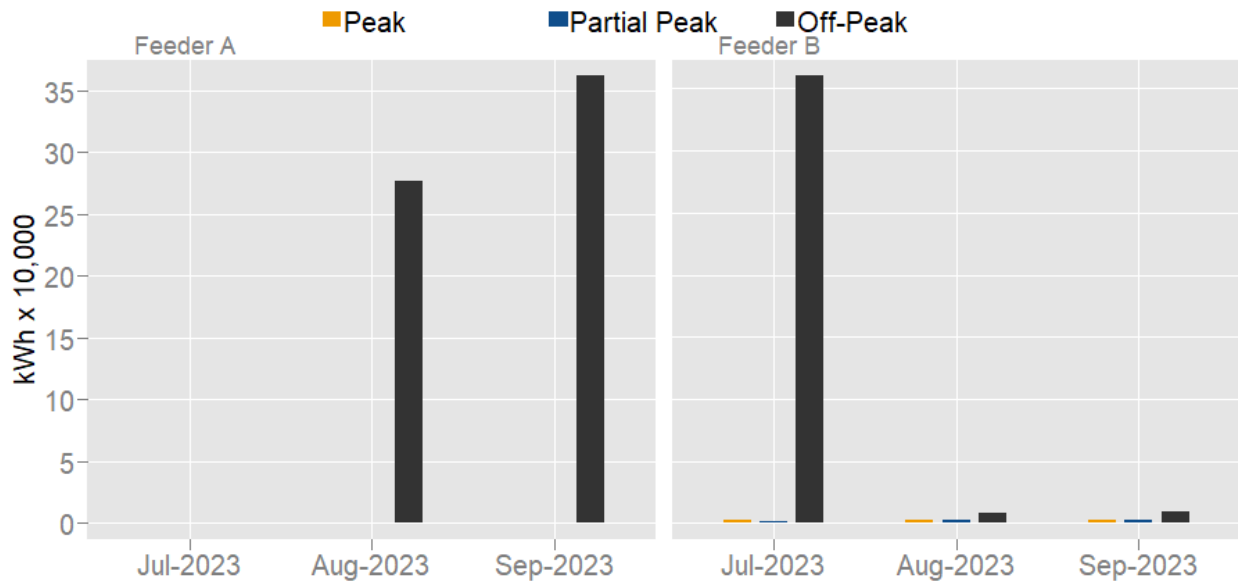


Figure 2 LAVWMA Quarter 1 FYE 2024 electric usage as kilowatt hour (kWh) for Jul-2023, Aug-2023, & Sep-2023; monthly usage displayed separately for feeder A (left) & feeder B (right) by time of use relevant for this quarter: peak, partial peak, off-peak

Quarterly Report of Operations LAVWMA Pumping and Conveyance System

Preventative maintenance (PM) work orders exceeded corrective maintenance (CM) work orders each month during Q1 FYE 2024 (Figure 3 right). Higher than normal CM hours for Aug-2023 were due to inspection of the 54-inch Alamo Canal Emergency Discharge gate (Figure 3 left).

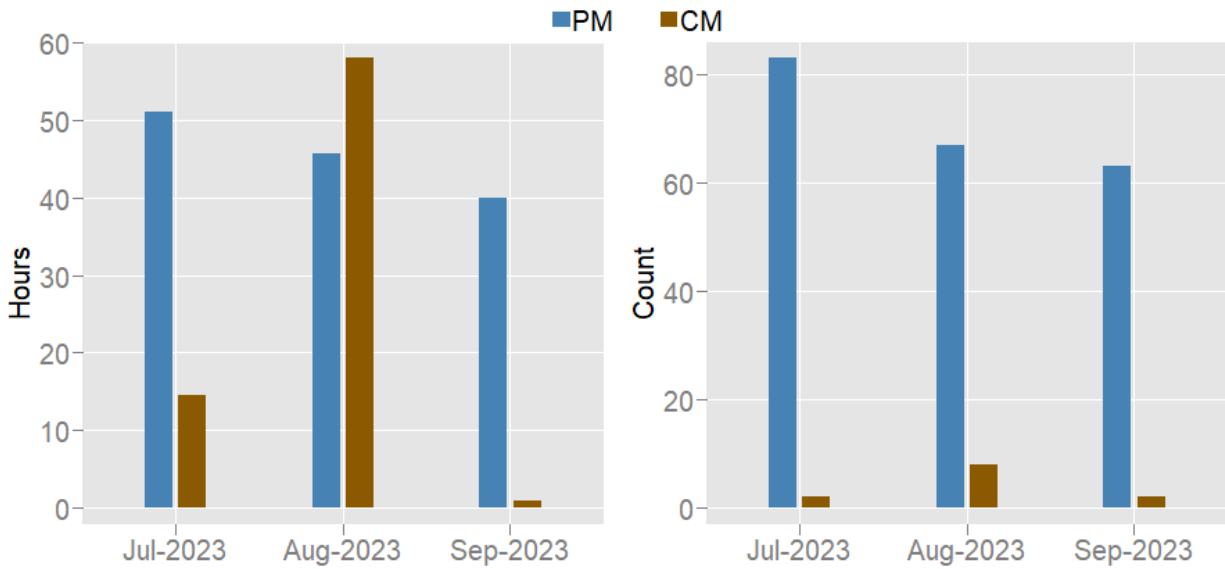


Figure 3 LAVWMA Quarter 1 FYE 2024 preventative maintenance (PM) & corrective maintenance (CM) work order hours (left) and count (right) for Jul-2023, Aug-2023, & Sep-2023

Quarterly Report of Operations

LAVWMA Pumping and Conveyance System

EXECUTIVE SUMMARY

The Livermore-Amador Valley Water Management Agency (LAVWMA) pumping and effluent conveyance system operated normally during the first quarter of Fiscal Year 2023-2024. A total of 556.61 million gallons of fully treated secondary effluent were pumped to San Francisco Bay via the East Bay Dischargers Authority (EBDA) outfall diffuser and San Leandro Sample Station (SLSS). The overall efficiency of the pumping system averaged 72.6%, with an average electrical cost of \$506 per million gallons, or \$165 per acre-foot.

OPERATIONS

Of the 556.61 million gallons of effluent conveyed through the LAVWMA system during the first quarter, approximately 328 million gallons came from the City of Livermore, 229 million gallons from City of Pleasanton and 0 million gallons from Dublin San Ramon. Refer to TABLE 4 - Monthly Export Flow and EBDA Monthly Reports, which detail daily export flows and monitoring analysis of the treated effluent during the quarter.

PG&E's current rate plan has four time-of-use (TOU) periods (in order of decreasing rates): peak (year-round), partial peak (June-September), off-peak (year-round), and super off-peak (March-May). Whenever possible, staff implement an efficient pumping plan to avoid pumping during higher rate periods (i.e., peak and partial peak).

The LAVWMA system experienced a series of brief PG&E power outages on August 7. PG&E explained that a very large outage in South San Ramon may have interrupted substations feeding the LAVWMA system power. DSRSD staff successfully transferred power over from the backup generator and reset Pumps 5, 8 and 10. Throughout this period, DSRSD staff was able to continue to meet the demands of the LAVWMA system; there was no impact during the power outages, which lasted around two hours.

In September, the California State Water Resources Control Board (SWRCB) performed a permit inspection of the LAVWMA export pump station. Representatives from DSRSD, LAVWMA and EBDA were in attendance to address any inquiries. At the conclusion of the inspection, all supporting agencies were found to be compliant and no violations were issued.

Over the past quarter, DSRSD staff strategically managed LAVWMA's holding basins to minimize the number of pumps running during a given billing cycle. Such an approach was based on anticipated flows from the City of Livermore and DSRSD's wastewater treatment facilities. Refer to Figure 2 and TABLE 1 - Electric Usage, Efficiency, and Costs for more information about energy use.

MAINTENANCE

During the quarter, staff logged 136.75 hours completing 213 preventative maintenance (PM) work orders and 73.5 hours completing 12 corrective maintenance (CM) work orders on LAVWMA equipment and systems. Refer to Figure 3 for monthly breakdown.

In August, DSRSD staff facilitated an inspection of the 54-inch Alamo Canal Emergency Discharge gate. If the LAVWMA system is unable to process influent flows for any reason, the permit provides an alternative discharge location. The alternative discharge procedure uses the 54-inch slide gate located at the junction structure. The inspection required coordination with the City of Livermore to stop flows and allow access to the gate. Proper maintenance of this gate is critical to the emergency readiness of the system. The DSRSD labor required to complete the inspection led to an increase in corrective work order labor hours logged in August.

Quarterly Report of Operations LAVWMA Pumping and Conveyance System

The following are some additional noteworthy maintenance activities during the quarter:

Electrical

- Replaced panel indicators at Rectifier L-4 panel
- Replaced failed chlorine analyzer sample pump for Livermore line at junction structure
- Assisted inspection of 54-inch gate at junction structure
- Troubleshoot RTD sensors at Export Pumps 3 and 7
- Troubleshoot power monitoring system at pump station

Instrumentation and Controls

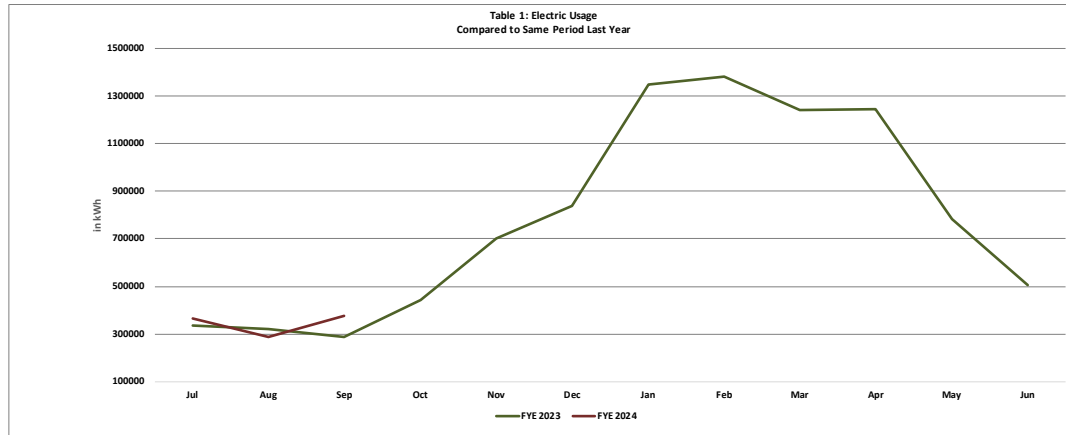
- Supported San Leandro Sample Station Upgrade project document review. Project was awarded to McQuire and Hester
- Corrected air pressure issue on Surge Tank 1 at pump station
- Continued to install and test rectifier remote monitoring equipment

Quarterly Report of Operations LAVWMA Pumping and Conveyance System

TABLE 1 - Electric Usage, Efficiency, and Costs

LAVWMA SYSTEM: Fiscal Year 2023-2024, Quarterly Report

PG&E Service Accounts: Rate Schedule B20 starting March 2021														Total Export Flow ¹	Pumping							
Acct # 8482061923-1 Service A						Acct # 8440395259-5 Service B						Billing Days	Total			Energy	Cost		Efficiency			
Month	kWh	Peak	Partial Peak	Off Peak	Super Off Peak	\$	kWh	Peak	Partial Peak	Off Peak	Super Off Peak		\$	Days	kWh	\$/kWh	\$	MG	kWh/MG	\$/MG	\$/AF	%
Jul-23	0	0	0	0	0	\$1,995	364,203	2,155	1,941	360,107	0	\$96,651	31	364,203	\$0.27	\$98,646	180	2,018	\$547	\$178	68.9%	
Aug-23	276,136	0	0	276,136	0	\$64,834	12,987	2,471	2,123	8,393	0	\$8,605	31	289,123	\$0.25	\$73,439	155	1,868	\$474	\$155	74.4%	
Sep-23	361,638	0	0	361,638	0	\$89,817	14,026	2,735	2,225	9,066	0	\$10,145	30	375,664	\$0.27	\$99,961	201	1,869	\$497	\$162	74.4%	
Oct-23														0		\$0	0	n/a	n/a	n/a	n/a	
Nov-23														0		\$0	0	n/a	n/a	n/a	n/a	
Dec-23														0		\$0	0	n/a	n/a	n/a	n/a	
Jan-24														0		\$0	0	n/a	n/a	n/a	n/a	
Feb-24														0		\$0	0	n/a	n/a	n/a	n/a	
Mar-24														0		\$0	0	n/a	n/a	n/a	n/a	
Apr-24														0		\$0	0	n/a	n/a	n/a	n/a	
May-24														0		\$0	0	n/a	n/a	n/a	n/a	
Jun-24														0		\$0	0	n/a	n/a	n/a	n/a	
Quarter																						
Average	212,591					\$52,215	130,405					\$38,467	31	342,997	\$0.26	\$90,682	179	1,918	\$506	\$165	72.6%	
Total	637,774					\$156,646	391,216					\$115,400	92	1,028,990		\$272,046	536	5,755				
Minimum	0					\$1,995	12,987					\$8,605	30	289,123	\$0.25	\$73,439	155	1,868	\$474	\$155	68.9%	
Maximum	361,638					\$89,817	364,203					\$96,651	31	375,664	\$0.27	\$99,961	201	2,018	\$547	\$178	74.4%	
YTD																						
Average	212,591					\$52,215	130,405					\$38,467	31	85,749	\$0.26	\$22,671	45	1,918	\$506	\$165	72.6%	
Total	637,774					\$156,646	391,216					\$115,400	92	1,028,990		\$272,046	536	5,755				
Minimum	0					\$1,995	12,987					\$8,605	30	0	\$0.25	\$0	0	1,868	\$474	\$155	68.9%	
Maximum	361,638					\$89,817	364,203					\$96,651	31	375,664	\$0.27	\$99,961	201	2,018	\$547	\$178	74.4%	



NOTES:

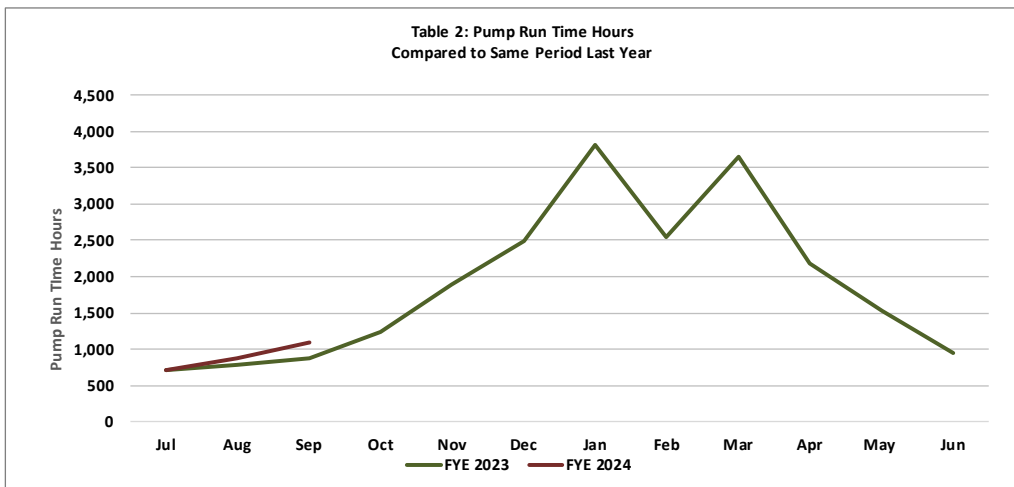
- 1) This Table 1 does not reflect what was the actual expenditures paid for the month and may not match what is in Table 8 Expenditures. The primary purpose of Table 1 is to show the electric usage and efficiency for the month it actually occurred.
- 2) To calculate pumping efficiency, read dates, electric usage, and export flows are matched to PG&E billing periods: 6/13 - 7/13 for July, 7/14 - 8/13 for August, and 8/14 - 9/12 for September.
- 3) Pumping efficiency is based on continuous average flows and a TDH of 442.8 feet, including static lift of 408.8 feet and piping losses of 34 feet (per Charlie Joyce, B&C, 2/12/07).

Quarterly Report of Operations LAVWMA Pumping and Conveyance System

TABLE 2 - Pump Run Time Hours

LAVWMA SYSTEM: Fiscal Year 2023-2024, Quarterly Report

Month	Pump	Pump	Pump	Pump	Pump	Pump	Pump	Pump	Pump	Pump	TOTAL	
	No. 1 Hours	No. 2 Hours	No. 3 Hours	No. 4 Hours	No. 5 Hours	No. 6 Hours	No. 7 Hours	No. 8 Hours	No. 9 Hours	No. 10 Hours	Pump Run Hours	Pump Utilization %
Jul-23	0	104	30	89	178	5	0	47	105	148	707	9.5%
Aug-23	0	0	17	0	387	112	0	97	0	262	874	11.7%
Sep-23	0	0	41	0	340	352	0	78	0	280	1,091	15.1%
Oct-23											0	0.0%
Nov-23											0	0.0%
Dec-23											0	0.0%
Jan-24											0	0.0%
Feb-24											0	0.0%
Mar-24											0	0.0%
Apr-24											0	0.0%
May-24											0	0.0%
Jun-24											0	0.0%
Quarter												
Average	0	35	29	30	302	156	0	74	35	230	890	12.1%
Total	0	104	88	89	905	468	0	221	105	690	2,671	
Minimum	0	0	17	0	178	5	0	47	0	148	707	9.5%
Maximum	0	104	41	89	387	352	0	97	105	280	1,091	15.1%
YTD												
Average	0	35	29	30	302	156	0	74	35	230	223	3.0%
Total	0	104	88	89	905	468	0	221	105	690	2,671	
Minimum	0	0	17	0	178	5	0	47	0	148	0	0.0%
Maximum	0	104	41	89	387	352	0	97	105	280	1,091	15.1%

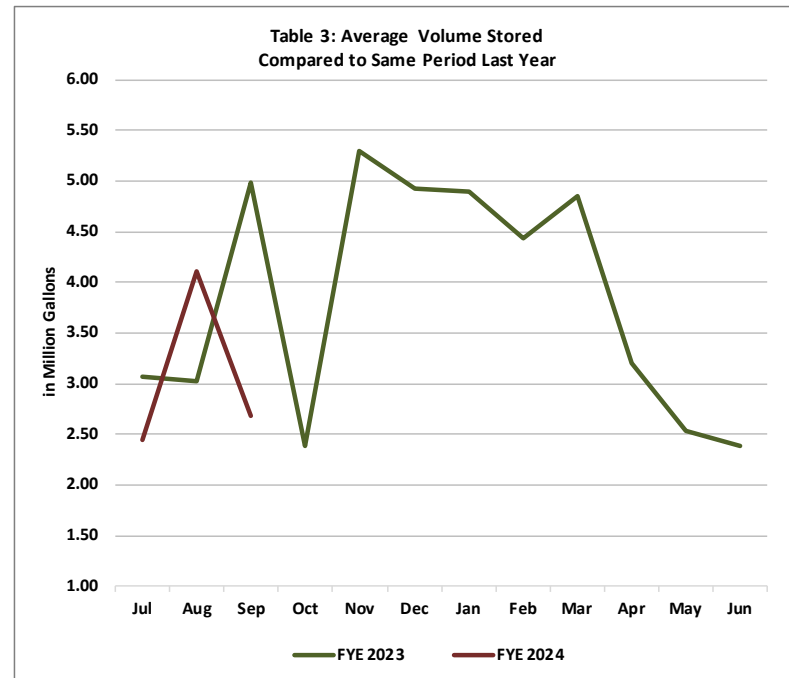


**Quarterly Report of Operations
LAVWMA Pumping and Conveyance System**

TABLE 3 - Monthly Average Storage Basin Levels and Volume

LAVWMA SYSTEM: Fiscal Year 2023-2024, Quarterly Report

Month	Average Daily Volume			Average	Storage	Storage
	Basin	Basin	Basin	Volume	Available	Basin
	No. 1	No. 2	No. 3	Stored	MG	Utilization
	Feet	Feet	Feet	MG	MG	%
Jul-23	3.09	0.09	1.85	2.44	18	13.6%
Aug-23	3.39	1.36	3.43	4.11	18	22.8%
Sep-23	2.61	0.11	2.71	2.68	18	14.9%
Oct-23					18	0.0%
Nov-23					18	0.0%
Dec-23					18	0.0%
Jan-24					18	0.0%
Feb-24					18	0.0%
Mar-24					18	0.0%
Apr-24					18	0.0%
May-24					18	0.0%
Jun-24					18	0.0%
Quarter						
Average	3.03	0.52	2.66	3.08		0.17
Minimum	2.61	0.09	1.85	2.44		0.14
Maximum	3.39	1.36	3.43	4.11		0.23
YTD						
Average	3.00	0.73	3.07	3.08		4.3%
Minimum	2.61	0.11	2.71	2.44		0.0%
Maximum	3.39	1.36	3.43	4.11		22.8%



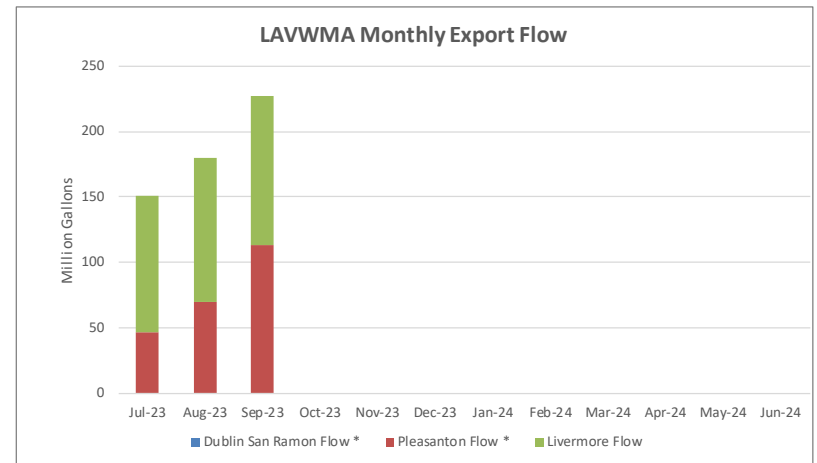
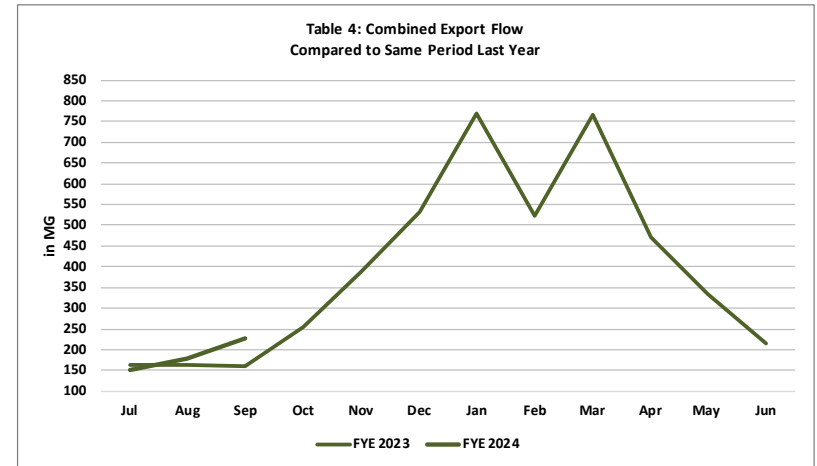
Note: Total available storage volume is 18 million gallons.

Quarterly Report of Operations LAVWMA Pumping and Conveyance System

TABLE 4 - Monthly Export Flow

LAVWMA SYSTEM: Fiscal Year 2023-2024, Quarterly Report
Estimated Flow: 3,374 MG

Month	Dublin San Ramon	Pleasanton	Livermore	Combined Export	Total for Quarter	PGE tab
	Flow * MG	Flow * MG	Flow MG	Flow MG		
Jul-23	0.00	46.25	104.32	150.57		150.57
Aug-23	0.00	69.73	109.72	179.45		179.44
Sep-23	0.00	112.88	113.72	226.60	556.61	90.69
Oct-23	0.00	0.00				0.00
Nov-23	0.00	0.00				0.00
Dec-23	0.00	0.00			0.00	0.00
Jan-24	0.00	0.00				0.00
Feb-24	0.00	0.00				0.00
Mar-24	0.00	0.00			0.00	0.00
Apr-24	0.00	0.00				0.00
May-24	0.00	0.00				0.00
Jun-24	0.00	0.00			0.00	115.57
Quarter						
Total	0.00	228.86	327.75	556.61		
Average	0.00	76.29	109.25	185.54		
Minimum	0.00	46.25	104.32	150.57		
Maximum	0.00	112.88	113.72	226.60		
YTD						
Total	0.00	228.86	327.75	556.61		Budgeted Flow: 3,374
Average	0.00	19.07	109.25	185.54		
Minimum	0.00	0.00	104.32	150.57		
Maximum	0.00	112.88	113.72	226.60		



* Monthly totals do not include flows diverted for recycling use by DERWA and Pleasanton.

Quarterly Report of Operations LAVWMA Pumping and Conveyance System

EBDA Monthly Reports

LAVWMA / 2023

Enter only numerical data in the result columns and only qualifiers in the qualifier columns. Any other comments should go in the corresponding cell on the Comments tab.

Parameter	Flow	CBOD Qual	CBOD	TSS Qual	TSS	pH	pH	Total Residual Chlorine	Total Residual Chlorine	Fecal Qual	Fecal Coliforms	Enterococci Qual	Enterococci
Units	MGD		mg/L		mg/L	SU	SU	mg/L	mg/L		MPN/100mL		MPN/100mL
Test Method	Daily Average (Mean)		SM 5210 B-2011		SM 2540 D-2011	SM 4500-H+B-2011	SM 4500-H+B-2011	Daily Average (Mean)	Daily Average (Mean)		SM 9221 C,E-2006		Enterolert
MDL					1.4								
RL			3.0		4.5						2		10
Location	LAVWMA-EXP		LAVWMA-EXP		LAVWMA-EXP	LAVWMA-EXP	LAVWMA-EXP	LAVWMA-EXP	SLSS		SLSS		SLSS
7/1/2023	7.23					7.26	7.52	0.82					
7/2/2023	6.17					7.27	7.59	1.20					
7/3/2023	4.10					7.07	7.75	0.98					
7/4/2023	2.91					7.47	7.75	1.61					
7/5/2023	4.05		3.8	DNQ	3.3	7.35	7.65	0.89			22	<	10
7/6/2023	6.52					7.49	7.98	1.38					
7/7/2023	5.45					7.40	7.57	2.08					
7/8/2023	8.52					7.35	7.64	2.27					
7/9/2023	4.87					7.23	7.54	1.23					
7/10/2023	3.64					7.21	7.55	1.49					
7/11/2023	4.43					7.33	7.58	1.30			13	<	10
7/12/2023	3.78		3.3		5.1	7.33	7.84	1.53					
7/13/2023	3.26					7.31	7.91	0.80					
7/14/2023	4.50					7.30	7.74	1.18					
7/15/2023	8.22					7.19	7.57	0.84					
7/16/2023	6.27					7.23	7.36	1.94					
7/17/2023	3.01					7.21	7.59	1.97					
7/18/2023	4.11					7.25	7.69	0.92			23	<	10
7/19/2023	3.61		4.2		9.6	7.33	7.69	1.36					
7/20/2023	3.83					7.42	7.98	0.88					
7/21/2023	2.92					7.06	7.46	0.79					
7/22/2023	6.32					7.11	7.48	1.00					
7/23/2023	2.85					7.21	7.48	2.36					
7/24/2023	3.84					7.23	7.81	1.13					
7/25/2023	3.30					7.19	7.46	1.46			11		
7/26/2023	4.53	<	3.0		5.1	7.17	7.50	1.27					
7/27/2023	5.77					7.21	7.43	1.52					
7/28/2023	5.84					7.24	7.40	2.14					
7/29/2023	9.06					7.26	7.42	3.11					
7/30/2023	4.50					7.31	7.47	2.40					
7/31/2023	3.16					7.23	7.42	0.92					

Note:
Column 7 - pH Minimum; online
Column 8 - pH Maximum; online

Quarterly Report of Operations LAVWMA Pumping and Conveyance System

LAVWMA August 2023

Enter only numerical data in the result columns and only qualifiers in the qualifier columns. Any other comments should go in the corresponding cell on the Comments tab.

Parameter	Flow	CBOD Qual	CBOD	TSS Qual	TSS	pH	pH	Total Residual Chlorine	Total Residual Chlorine	Fecal Qual	Fecal Coliforms	Entero Qual	Enterococci
Units	MGD		mg/L		mg/L	SU	SU	mg/L	mg/L		MPN/100mL		MPN/100mL
Test Method	Daily Average (Mean)		SM 5210 B-2011		SM 2540 D-2011	SM 4500-H+B-2011	SM 4500-H+B-2011	Daily Average (Mean)	Daily Average (Mean)		SM 9221 C,E-2006		Enterolert
MDL			3.0		1.4								
RL			3.0		4.5						2		10
Location	LAVWMA-EXP		LAVWMA-EXP		LAVWMA-EXP	LAVWMA-EXP	LAVWMA-EXP	LAVWMA-EXP	SLSS		SLSS		SLSS
8/1/2023	5.61					7.10	7.70	0.34			13		
8/2/2023	5.08		3.0	DNQ	3.8	7.10	7.12	0.34					
8/3/2023	3.47					7.20	7.14	0.79					
8/4/2023	5.12					7.08	7.07	0.56					
8/5/2023	5.80					7.08	7.07	2.18					
8/6/2023	5.80					7.06	7.07	2.60					
8/7/2023	4.13					7.01	7.05	0.97					
8/8/2023	5.47					7.03	7.07	0.47			80		
8/9/2023	5.75		3.1		7.1	7.01	7.14	0.17					
8/10/2023	5.76					7.31	7.40	0.18					
8/11/2023	5.78					7.10	7.21	0.43					
8/12/2023	5.80					7.20	7.23	0.78					
8/13/2023	5.60					7.17	7.09	0.38					
8/14/2023	5.88					7.12	7.28	0.80					
8/15/2023	5.68					7.20	7.85	0.91			23		
8/16/2023	5.78		4.7		8.9	7.08	7.25	0.17					
8/17/2023	5.70					7.15	7.21	0.61					
8/18/2023	5.73					7.11	7.07	0.80					
8/19/2023	5.92					7.20	7.26	0.20					
8/20/2023	5.73					7.08	7.07	0.15					
8/21/2023	5.87					7.15	7.07	0.15					
8/22/2023	5.99					7.08	7.04	0.67			23		10
8/23/2023	5.82	ND	3.0		5.9	7.04	7.14	0.80					
8/24/2023	5.85					7.10	7.23	0.33					
8/25/2023	5.77					7.08	7.09	1.04					
8/26/2023	5.77					7.04	7.04	3.30					
8/27/2023	7.37					7.04	7.07	4.06					
8/28/2023	7.00					7.12	7.02	3.42					
8/29/2023	7.01					7.12	7.10	1.12			17	<	10
8/30/2023	8.29		3.2		5.2	7.01	7.13	0.91					
8/31/2023	5.11					7.15	7.41	0.66					

Note:
Column 7 - pH Minimum; online
Column 8 - pH Maximum; online

Quarterly Report of Operations LAVWMA Pumping and Conveyance System

LAVWMA September 2023

Enter only numerical data in the result columns and only qualifiers in the qualifier columns. Any other comments should go in the corresponding cell on the Comments tab.

Parameter	Flow	CBOD Qual	CBOD	TSS Qual	TSS	pH	pH	Total Residual Chlorine	Total Residual Chlorine	Fecal Qual	Fecal Coliforms	Entero Qual	Enterococci
Units	MGD		mg/L		mg/L	SU	SU	mg/L	mg/L		MPN/100mL		MPN/100mL
Test Method	Daily Average (Mean)		SM 5210 B-2011		SM 2540 D-2011	Instant Min	Instant Max	Daily Average (Daily Average (Mean)		SM 9221 C,E-2006		Enterolert
MDL			3.0		1.4								
RL			3.0		4.5						2		10
Location	LAVWMA-EXP		LAVWMA-EXP		LAVWMA-EXP	LAVWMA-EXP	LAVWMA-EXP	LAVWMA-EXP	SLSS		SLSS		SLSS
9/1/2023	6.42					7.21	7.59	0.68					
9/2/2023	7.90					7.21	7.45	0.61					
9/3/2023	7.14					7.16	7.39	1.24					
9/4/2023	6.43					7.16	7.43	0.96					
9/5/2023	8.78					7.21	7.74	1.05			4	<	10
9/6/2023	8.76		4.6		5.9	7.56	7.73	1.37					
9/7/2023	8.35					7.68	7.98	0.87					
9/8/2023	6.87					7.53	7.73	0.81					
9/9/2023	5.76					7.50	7.73	0.93					
9/10/2023	8.79					7.41	7.67	0.95					
9/11/2023	8.71					7.55	7.90	0.60					
9/12/2023	6.77					7.41	7.70	0.76			4		20
9/13/2023	5.39		3.1		7.6	7.55	7.84	0.89					
9/14/2023	7.33					7.31	7.68	0.59					
9/15/2023	6.22					7.40	7.75	0.54					
9/16/2023	7.03					7.37	7.53	0.43					
9/17/2023	8.48					7.24	7.43	0.40					
9/18/2023	8.62					7.18	7.41	0.37					
9/19/2023	6.53					7.31	7.55	0.57			2		10
9/20/2023	7.75		3.3	DNQ	3.7	7.34	7.58	0.76					
9/21/2023	6.64					7.18	7.45	0.58					
9/22/2023	6.39					7.29	7.44	0.54					
9/23/2023	6.42					7.18	7.46	0.46					
9/24/2023	8.42					7.22	7.37	0.61					
9/25/2023	8.71					7.21	7.38	0.78					
9/26/2023	7.30					7.22	7.41	0.84			17	<	10
9/27/2023	8.56		3.7		7.3	7.32	7.41	0.89					
9/28/2023	8.67					7.29	7.51	0.79					
9/29/2023	8.72					7.29	7.39	0.83					
9/30/2023	8.74					7.31	7.41	0.56					

Note:
Column 7 - pH Minimum; online
Column 8 - pH Maximum; online

**Quarterly Report of Operations
LAVWMA Pumping and Conveyance System**

Langelier Saturation Index Report (Livermore, DSRSD, LAVWMA)

**CITY OF LIVERMORE
LIVERMORE WATER RECLAMATION PLANT**

Livermore - 3rd Quarter 2023
Langelier pH Saturation Index

Collection DATE	TDS (mg/L)	Temp (°C)	Ca Hardness (mg/L CaCO ₃)	Alkalinity (mg/L CaCO ₃)	pH (Actual)	pH Saturation	Langelier Index
07/05/23	510	25.0	61	279	7.5	7.6	-0.1
08/02/23	500	26.0	55	263	7.5	7.7	-0.2
09/06/23	510	25.0	56	232	7.6	7.7	-0.2
MAXIMUM	510	26.0	61	279	7.6	7.7	-0.1
MINIMUM	500	25.0	55	232	7.5	7.6	-0.2
AVERAGE	507	25.3	57	258	7.5	7.7	-0.2

**DUBLIN SAN RAMON SERVICES DISTRICT
WASTEWATER TREATMENT FACILITY**

DSRSD - 3rd Quarter 2023
Langelier pH Saturation Index

Collection DATE	TDS (mg/L)	Temp (°C)	Ca Hardness (mg/L CaCO ₃)	Alkalinity (mg/L CaCO ₃)	pH (Actual)	pH Saturation	Langelier Index
07/18/23	780	22.9	180	334	7.4	7.1	0.3
08/07/23	532	26.6	66	198	7.3	7.7	-0.4
09/26/23	567	26.3	96	262	7.3	7.4	-0.1
MAXIMUM	780	26.6	180	334	7.4	7.7	0.3
MINIMUM	532	22.9	66	198	7.3	7.1	-0.4
AVERAGE	626	25.3	114	265	7.3	7.4	-0.1

**DUBLIN SAN RAMON SERVICES DISTRICT
WASTEWATER TREATMENT FACILITY**

LAVWMA - 3rd Quarter 2023
Langelier pH Saturation Index

Collection DATE	TDS (mg/L)	Temp (°C)	Ca Hardness (mg/L CaCO ₃)	Alkalinity (mg/L CaCO ₃)	pH (Actual)	pH Saturation	Langelier Index
07/18/23	532	23.9	72	289	7.5	7.5	0.0
08/07/23	564	25.3	68	288	7.4	7.5	-0.1
09/26/23	584	25.6	84	280	7.4	7.4	0.0
MAXIMUM	584	25.6	84	289	7.5	7.5	0.0
MINIMUM	532	23.9	68	280	7.4	7.4	-0.1
AVERAGE	560	24.9	75	286	7.4	7.5	0.0