APPENDIX J

Chloride Concentrations in Discharge for Irrigation – Chloride Concentration Sensitivity Analysis

2012-2035

GEOSCIENCE

APPENDIX J

CHLORIDE CONCENTRATIONS IN DISCHARGE – CHLORIDE CONCENTRATION SENSITIVITY ANALYSIS

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APPENDIX J

CHLORIDE CONCENTRATIONS IN DISCHARGE FOR IRRIGATION – CHLORIDE CONCENTRATION SENSITIVITY ANALYSIS

The use of recycled water is a key component in the long-term water supply management in the Santa Clarita Valley. For this study, the impact of recycled water on the water quality of the groundwater basin was investigated for treated effluent discharged to the Santa Clara River and recycled water applied to the land surface for landscape irrigation. Predictive scenarios were run with the following assumptions: The average chloride concentration for State Water Project water since 2000 is 70 mg/L with a median is 73 mg/L. The added increment varies significantly before it reaches the WRPs. Review of the data, indicates that an additional 45 mg/L is reasonable for assuming chloride concentration in the treated effluent discharge through 2013. However, the 45 mg/L increment is lower than that experienced since 2010 (mean=55 mg/L, median=54 mg/L). Taking the two averages results in an anticipated chloride concentration of about 125 mg/L for the anticipated recycled water. Planning for proposed Newhall Ranch Water Reclamation Plant, also projects that chloride concentration of the treated wastewater will have a concentration of 125 mg/L. Therefore, predictive modeling for the recycled water assumed that chloride concentration will be 125 mg/L with the exception of the a portion of the the Santa Clarita Valley Sanitation District (SCVSD) recycled water where a portion of the waste stream will be treated to achieve a weighted average of 100 mg/L to comply with regulations.

Subsequent to our initial predictive modeling, The SCVSD recommended additional predictive modeling using a higher chloride concentration for recycled water to be used for landscape irrigation. The District is planning to use the recycled water (RW) General Order for future recycled water permitting, which requires that the recycled water "production, distribution, and use" has to be "in compliance" with the Salt and Nutrient Management Plan adopted by the Regional Water Board as a Basin Plan Amendment.

Therefore, a sensitivity analysis was conducted to evaluate the impacts of a greater concentration of chloride in recycled water used for landscape irrigation as a part of this SNMP. The purpose of a sensitivity analysis was to assess the impact of recycled water chloride concentration under CLWA Recycled Water Master Plan in Management Zone 3 and 4 using a higher concentration of chloride. Recycled water discharged to the river will be treated by reverse osmosis (RO) and will have a maximum average chloride concentration of 100 mg/L, while recycled water used for landscape irrigation may have a higher chloride concentration of approximately 125 mg/L (the initial model runs used 125 mg/L

as the chloride concentration). In an effort to determine whether higher chloride concentrations would significantly change the basin's assimilative capacity, a sensitivity run was conducted by using 156 mg/L[1] as the recycled water chloride concentration to be used for landscape irrigation. In the mass loading tables (Table H-37a in Appendix H), the irrigation efficiency and absorption factor were applied to calculate chloride concentration. In other words, recycled water concentration is input into the model as follows: The initially assumed concentration of 125 mg/L was concentrated by four and is assumed to lose 20% by adsorption (=125 x 4 x 0.8 = 400 mg/L). Therefore, a concentration of 125 mg/L applied recycled water is input in to the model as 400 mg/L. Similarly the increased chloride concentration of 156 mg/L is simulated using a concentration of 500 mg/L (=156 mg/L x 4 x 0.8).

Table J-1 below compares the changes in assimilative capacity between current model and sensitivity run as a result of CLWA Recycled Water Master Plan. The concentrations shown in columns [1] and [2] are the resulting average concentrations for the initial model and sensitivity run respectively for Management Zone 3 and Management Zone 4. The assimilative capacity for the initial run and sensitivity run are reported in columns [3] and [4] respectively. Column [5] reports the change in assimilative capacity between the initial run and the sensitivity run for Management Zone 3 and Management Zone 4. As shown, a higher chloride concentration will result in a decline of assimilative capacity from 17.2 mg/L to 15.9 mg/L in Management Zone 3, while in Management Zone 4 results in a decline from 5.2 mg/L to 4.7 mg/L. The supporting tables for the sensitivity analysis are provided in Appendix J. Tables J-2 through J-4 provide a summary of the anticipated water quality change from the sensitivity analysis for the CLWA Recycled Water Master Plan for Management Zones 3, 4 and 6, respectively. Tables J-5 through J-7 provide a summary of the anticipated water quality change from the sensitivity analysis for the CLWA Recycled Water Master Plan along with "All Projects for Management Zones 3, 4 and 6, respectively. The anticipated water quality changes in the management zones as a result of the increased chloride concentration sensitivity analysis are shown in the spreadsheets. The sensitivity analysis indicates that the decline in assimilative capacity is insignificant at the higher chloride concentration used in the sensitivity analysis for both the single project and "All Projects" in Management Zones 3 and 4. There is no change in assimilative capacity in Management Zone 6 for either single project or all projects combined.

[1] The average chloride concentration in the Valencia Plant effluent was 156 mg/L during the base period 2001-2011. The maximum concentration was 213 mg/L in January 2003. The average chloride concentration in the Saugus Plant effluent was 145 mg/L during the base period with an maximum concentration 0f 200 mg/L recorded in June of 2003.

Table J-1. Summary of Sensitivity Analysis – Using Increased Recycled Water Chloride Concentration for the CLWA Recycled Water Master Plan - 2012 through 2035 and "All Projects – 2012 through 2035

Agency Proponent	Management Zone	Average Chloride Concentration, mg/L		Assimilative Capacity, mg/L		Changes in Assimilative Capacity, mg/L
		[1]	[2]	[3]	[4]	[5]
		Current Model	Sensitivity Run	Current Model	Sensitivity Run	
CLWA Recycled Water Master Plan	Management Zone 3	82.8	84.1	17.2	15.9	-1.3
	Management Zone 4	94.8	95.3	5.2	4.7	-0.5
All Projects	Management Zone 3	80.7	82.0	19.3	18	-1.3
	Management Zone 4	88.3	88.8	11.7	11.2	-0.5

Castaic Lake Water Agency
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Table J-2

Projected Chloride Mass Loading and Concentration Changes - Sensitivity Run - Management Zone 3 (South Fork Subunit) - CLWA Recycled Water Master Plan - 2012 through 2035

Year	Deep Perc of Precip [acre-ft]	Chloride Conc. for Deep Perc of Precip [mg/L]	Deep Perc from Septic Systems [acre-ft]	Chloride Conc. for Deep Perc from Septic Systems [mg/L]	Applied Water Recharge Outside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Outside West Side Villages [mg/L]	Applied Water Recharge Inside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Inside West Side Villages [mg/L]	Applied Recycled Water [acre-ft]	Chloride Conc. for Applied Recycled Water [mg/L]	Stream Leakage [acre-ft]	Chloride Conc. for Stream Leakage [mg/L]	Inflow From Upstream Tributaries [acre-ft]	Chloride Conc. For Inflow From Upstream Tributaries [mg/L]	Inflow From MZ2 [acre-ft]	Chloride Conc. for Inflow From MZ2 [mg/L]	Upward Leakage from Saugus + Net Lateral Inflow from Adjoining Units [acre-ft]	Chloride Conc. for Upward Leakage from Saugus + Net Lateral Inflow from Adjoining Units [mg/L]	TOTAL INFLOW [acre-ft]	TOTAL INFLOW MASS of Chloride [tons]	Pumping [acre-ft]	GW Discharge to Streams [acre-ft]	Evapo-trans-piration [acre-ft]	Outflow to MZ4 [acre-ft]	Downward Leakage to Saugus [acre-ft]	TOTAL OUTFLOW [acre-ft]	TOTAL OUTFLOW MASS of Chloride [tons]	Starting Storage [acre-ft]	Starting Concentration [mg/L]	Change in GW Storage [acre-ft]	Ending Storage [acre-ft]	Ending Concentration [mg/L]	Starting Mass in GW Storage [ton]	Ending Mass in GW Storage [ton]	Mass change [tons]
2012	4,214	40	181	95	772	275	0	0	0	500	6,085	65	0	0	292	111	7,741	39	19,285	1,541	0	0	3,696	5,579	6,113	15,388	1,636	25,728	103	3,898	29,626	**87**	3,600	3,505	**-95**
2013	274	40	181	95	773	275	0	0	89	500	737	65	0	0	323	115	7,805	40	10,181	926	0	0	2,366	5,283	5,691	13,340	1,298	29,626	87	-3,159	26,466	**87**	3,505	3,133	**-372**
2014	2,277	40	181	95	773	275	0	0	96	500	4,962	65	0	0	309	113	5,898	40	14,496	1,314	0	0	3,004	4,371	5,819	13,193	1,206	26,466	87	1,303	27,769	**86**	3,133	3,241	**108**
2015	8,986	40	181	95	774	275	0	0	103	500	3,952	65	0	0	321	106	7,949	41	22,266	1,711	0	0	3,654	5,444	5,995	15,094	1,335	27,769	86	7,172	34,941	**76**	3,241	3,617	**376**
2016	0	40	181	95	774	275	0	0	111	500	0	65	0	0	341	113	7,973	41	9,380	880	0	0	2,869	5,612	5,895	14,376	1,191	34,941	76	-4,996	29,945	**81**	3,617	3,306	**-311**
2017	0	40	181	95	775	275	0	0	118	500	0	65	0	0	351	113	6,506	40	7,931	804	0	0	1,336	4,660	5,570	11,566	1,129	29,945	81	-3,636	26,309	**83**	3,306	2,980	**-325**
2018	1,818	40	181	95	775	275	0	0	125	500	3,992	65	0	0	359	109	6,610	41	13,860	1,272	0	0	1,990	4,603	5,635	12,228	1,160	26,309	83	1,632	27,942	**81**	2,980	3,093	**113**
2019	265	40	181	95	776	275	0	0	133	500	718	65	0	0	350	112	8,284	41	10,706	1,001	0	0	2,032	5,266	6,714	14,012	1,326	27,942	81	-3,306	24,635	**83**	3,093	2,768	**-325**
2020	1,056	40	181	95	777	275	0	0	140	500	2,381	65	0	0	365	110	6,737	42	11,637	1,118	0	0	1,988	4,526	7,631	14,145	1,366	24,635	83	-2,508	22,127	**84**	2,768	2,520	**-248**
2021	0	40	181	95	777	275	0	0	147	500	0	65	0	0	399	110	7,303	43	8,807	898	0	0	1,158	4,606	6,841	12,605	1,304	22,127	84	-3,798	18,329	**85**	2,520	2,115	**-406**
2022	0	40	181	95	778	275	0	0	155	500	0	65	0	0	407	107	7,656	44	9,176	932	0	0	641	4,695	7,299	12,634	1,384	18,329	85	-3,458	14,871	**82**	2,115	1,663	**-452**
2023	2,221	40	181	95	778	275	0	0	162	500	4,160	65	0	0	399	102	7,733	44	15,634	1,438	0	0	1,778	4,860	8,634	15,272	1,509	14,871	82	362	15,233	**77**	1,663	1,592	**-71**
2024	6,294	40	181	95	779	275	0	0	169	500	5,602	65	0	0	415	97	7,784	46	21,224	1,807	0	0	3,291	5,093	9,390	17,773	1,514	15,233	77	3,451	18,684	**74**	1,592	1,885	**293**
2025	5,383	40	181	95	779	275	0	0	177	500	6,749	65	0	0	409	97	9,956	46	23,633	2,011	0	0	3,925	6,385	6,698	17,008	1,320	18,684	74	6,625	25,309	**75**	1,885	2,576	**691**
2026	0	40	181	95	780	275	0	0	184	500	0	65	0	0	382	105	9,740	47	11,267	1,122	0	0	2,752	6,115	6,755	15,622	1,310	25,309	75	-4,355	20,954	**84**	2,576	2,388	**-188**
2027	5,440	40	181	95	780	275	0	0	191	500	6,946	65	0	0	317	102	7,174	48	21,030	1,872	0	0	3,643	5,043	6,144	14,830	1,275	20,954	84	6,200	27,154	**81**	2,388	2,985	**597**
2028	1,971	40	181	95	781	275	0	0	199	500	3,950	65	0	0	306	106	8,915	49	16,301	1,546	0	0	3,258	5,909	5,878	15,046	1,296	27,154	81	1,255	28,409	**84**	2,985	3,235	**250**
2029	541	40	181	95	782	275	0	0	206	500	1,290	65	0	0	295	112	8,093	50	11,386	1,191	0	0	2,680	5,351	5,672	13,703	1,255	28,409	84	-2,317	26,092	**89**	3,235	3,171	**-64**
2030	6,691	40	181	95	782	275	0	0	213	500	6,310	65	0	0	266	108	8,894	50	23,337	2,034	0	0	4,022	6,386	6,317	16,725	1,544	26,092	89	6,612	32,705	**82**	3,171	3,661	**490**
2031	0	40	181	95	783	275	0	0	221	500	0	65	0	0	305	113	8,493	51	9,981	1,103	0	0	2,131	5,727	5,715	13,573	1,281	32,705	82	-3,592	29,113	**88**	3,661	3,484	**-178**
2032	398	40	181	95	783	275	0	0	228	500	988	65	0	0	312	114	8,113	52	11,003	1,201	0	0	1,578	5,357	5,540	12,475	1,304	29,113	88	-1,472	27,641	**90**	3,484	3,381	**-103**
2033	2,920	40	181	95	784	275	0	0	235	500	4,407	65	0	0	314	109	6,391	52	15,232	1,530	0	0	2,214	4,529	6,770	13,513	1,382	27,641	90	1,720	29,361	**88**	3,381	3,529	**148**
2034	0	40	181	95	784	275	0	0	243	500	0	65	0	0	344	114	6,724	53	8,276	1,022	0	0	1,679	4,641	5,741	12,061	1,248	29,361	88	-3,784	25,576	**95**	3,529	3,303	**-226**
2035	990	40	181	95	785	275	0	0	250	500	2,240	65	0	0	347	113	6,695	54	11,487	1,284	0	0	1,470	4,544	5,450	11,464	1,290	25,576	95	22	25,599	**95**	3,303	3,296	**-7**

Castaic Lake Water Agency
Salt and Nutrient Management Plan
Santa Clara River Valley East Subbasin

Table J-3

Projected Chloride Mass Loading and Concentration Changes - Sensitivity Run - Management Zone 4 (Santa Clara - Bouquet and San Francisquito Canyon Subunit) - CLWA Recycled Water Master Plan - 2012 through 2035

Year	Deep Perc of Precip [acre-ft]	Chloride Conc. for Deep Perc of Precip [mg/L]	Deep Perc from Septic Systems [acre-ft]	Chloride Conc. for Deep Perc from Septic Systems [mg/L]	Applied Water Recharge Outside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Outside West Side Villages [mg/L]	Applied Water Recharge Inside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Inside West Side Villages [mg/L]	Applied Recycled Water [acre-ft]	Chloride Conc. for Applied Recycled Water [mg/L]	Saugus WRP Infiltration [acre-ft]	Chloride Conc. for Saugus WRP Infiltration [mg/L]	Stream Leakage [acre-ft]	Chloride Conc. for Stream Leakage [mg/L]	Inflow From Upstream Tributaries [acre-ft]	Chloride Conc. or Inflow From Upstream Tributaries [mg/L]	Inflow From MZ1 [acre-ft]	Chloride Conc. for Inflow From MZ1 [mg/L]	Inflow From MZ3 [acre-ft]	Chloride Conc. for Inflow From MZ3 [mg/L]	Upward Leakage from Saugus + Net Lateral Inflow from Adjoining Units [acre-ft]	Chloride Conc. for Upward Leakage from Saugus + Net Lateral Inflow from Adjoining Units [mg/L]	TOTAL INFLOW [acre-ft]	TOTAL INFLOW MASS of Chloride [tons]	Pumping [acre-ft]	GW Discharge to Streams [acre-ft]	Evapo-trans-piration [acre-ft]	Outflow to MZ5 [acre-ft]	Downward Leakage to Saugus [acre-ft]	TOTAL OUTFLOW [acre-ft]	TOTAL OUTFLOW MASS of Chloride [tons]	Starting Storage [acre-ft]	Starting Concentration [mg/L]	Change in GW Storage [acre-ft]	Ending Storage [acre-ft]	Ending Concentration [mg/L]	Starting Mass in GW Storage [ton]	Ending Mass in GW Storage [ton]	Mass change [tons]
2012	4,893	40	148	109	666	314	0	694	81	500	4,100	126	11,675	89	0	0	14,829	87	5,579	28	-5,182	28	36,788	4,505	13,388	6,543	1,102	7,025	2,202	30,260	3,811	78,359	96	6,528	84,888	**95**	10,241	10,935	**695**
2013	318	40	147	109	667	314	0	694	89	500	4,100	126	623	89	0	0	14,012	87	5,283	28	-1,853	28	23,385	2,955	13,370	5,290	763	7,327	2,152	28,902	3,625	84,888	95	-5,517	79,371	**95**	10,935	10,265	**-670**
2014	2,643	40	147	109	668	314	0	694	96	500	4,100	126	9,328	89	0	0	14,762	88	4,371	28	-1,307	28	34,808	4,221	19,000	4,129	642	8,008	1,988	33,766	4,284	79,371	95	1,042	80,413	**93**	10,265	10,202	**-63**
2015	10,432	40	147	109	669	314	0	694	103	500	4,100	126	7,637	89	0	0	14,876	85	5,444	28	-2,935	28	40,475	4,393	13,370	6,633	1,215	7,370	2,077	30,665	3,736	80,413	93	9,810	90,222	**89**	10,202	10,859	**657**
2016	0	40	148	109	671	314	0	694	111	500	4,100	126	22	89	0	0	15,133	87	5,612	28	-1,341	28	24,455	3,044	13,388	6,166	1,189	7,743	2,067	30,553	3,534	90,222	89	-6,097	84,125	**91**	10,859	10,368	**-491**
2017	0	40	147	109	672	314	0	694	118	500	4,100	126	1,107	89	0	0	15,667	89	4,660	28	848	28	27,319	3,325	19,000	3,885	533	8,261	1,907	33,586	4,074	84,125	91	-6,266	77,859	**91**	10,368	9,620	**-748**
2018	2,110	40	147	109	673	314	0	694	125	500	4,100	126	6,804	89	0	0	15,809	89	4,603	28	-1,083	28	33,288	4,073	19,000	3,363	368	8,124	1,874	32,729	3,998	77,859	91	560	78,418	**91**	9,620	9,694	**75**
2019	307	40	147	109	674	314	0	694	133	500	4,100	126	1,495	89	0	0	14,351	88	5,266	28	-3,014	28	23,458	3,106	13,370	3,153	354	7,742	2,770	27,388	3,342	78,418	91	-3,930	74,488	**93**	9,694	9,459	**-236**
2020	1,226	40	148	109	676	314	1	694	140	500	4,100	126	3,145	89	0	0	15,098	88	4,526	28	-549	28	28,511	3,522	19,025	1,993	233	8,101	3,847	33,200	4,186	74,488	93	-4,689	69,799	**93**	9,459	8,794	**-664**
2021	0	40	147	109	677	314	5	694	147	500	4,100	126	1,865	89	0	0	15,548	89	4,606	28	-1,231	28	25,864	3,363	19,000	1,039	145	7,777	2,964	30,926	3,878	69,799	93	-5,061	64,738	**94**	8,794	8,279	**-515**
2022	0	40	147	109	678	314	8	694	155	500	4,100	126	2,046	89	0	0	15,646	91	4,695	28	-1,738	28	25,736	3,413	19,000	446	103	7,575	3,913	31,037	3,956	64,738	94	-5,301	59,437	**96**	8,279	7,736	**-543**
2023	2,579	40	147	109	679	314	10	694	162	500	4,100	126	7,378	89	0	0	15,878	89	4,860	28	-3,762	28	32,032	4,135	19,000	116	59	7,195	5,828	32,198	4,183	59,437	96	-166	59,271	**95**	7,736	7,688	**-48**
2024	7,308	40	148	109	681	314	10	694	169	500	4,100	126	12,189	89	0	0	16,430	87	5,093	28	-6,421	28	39,706	4,910	19,025	89	57	6,910	6,185	32,266	4,178	59,271	95	7,440	66,711	**93**	7,688	8,420	**733**
2025	6,249	40	147	109	682	314	11	694	177	500	4,100	126	15,600	89	0	0	16,565	88	6,385	28	-11,665	28	38,251	5,159	13,370	1,542	341	6,661	3,074	24,988	3,111	66,711	93	13,263	79,973	**96**	8,420	10,469	**2,048**
2026	0	40	147	109	683	314	11	694	184	500	4,100	126	1,616	89	0	0	15,076	89	6,115	28	-6,621	28	21,312	3,151	13,370	2,478	340	7,167	3,302	26,658	3,445	79,973	96	-5,346	74,627	**100**	10,469	10,174	**-294**
2027	6,316	40	147	109	684	314	12	694	191	500	4,100	126	18,602	89	0	0	15,461	88	5,043	28	-7,168	28	43,389	5,516	19,000	3,486	848	7,540	2,460	33,333	4,429	74,627	100	10,056	84,683	**98**	10,174	11,262	**1,087**
2028	2,288	40	148	109	686	314	12	694	199	500	4,100	126	6,191	89	0	0	14,581	87	5,909	28	-6,388	28	27,725	3,749	13,388	3,997	959	7,278	2,396	28,018	3,599	84,683	98	-293	84,390	**99**	11,262	11,412	**150**
2029	628	40	147	109	687	314	12	694	206	500	4,100	126	1,321	89	0	0	13,788	88	5,351	28	-3,217	28	23,022	3,088	13,370	4,157	668	7,520	2,351	28,065	3,705	84,390	99	-5,043	79,347	**100**	11,412	10,795	**-617**
2030	7,768	40	147	109	688	314	12	694	213	500	4,100	126	10,899	89	0	0	16,691	91	6,386	28	-6,483	28	40,423	4,980	13,370	6,759	1,511	7,590	2,348	31,578	4,091	79,347	100	8,844	88,191	**97**	10,795	11,685	**890**
2031	0	40	147	109	689	314	12	694	221	500	4,100	126	334	89	0	0	15,167	91	5,727	28	-2,158	28	24,239	3,238	13,370	5,605	949	7,347	2,196	29,467	3,778	88,191	97	-5,229	82,962	**99**	11,685	11,144	**-541**
2032	462	40	148	109	691	314	12	694	228	500	4,100	126	908	89	0	0	14,269	91	5,357	28	-1,941	28	24,233	3,210	13,388	4,630	601	7,722	2,213	28,554	3,755	82,962	99	-4,321	78,641	**99**	11,144	10,599	**-545**
2033	3,390	40	147	109	692	314	12	694	235	500	4,100	126	9,510	89	0	0	14,985	90	4,529	28	-1,642	28	35,958	4,466	19,000	3,599	451	8,143	2,652	33,846	4,501	78,641	99	2,112	80,753	**96**	10,599	10,565	**-35**
2034	0	40	147	109	693	314	12	694	243	500	4,100	126	1,593	89	0	0	15,452	91	4,641	28	-826	28	26,055	3,436	19,000	2,424	274	8,055	2,052	31,805	4,125	80,753	96	-5,750	75,003	**97**	10,565	9,875	**-689**
2035	1,149	40	147	109	694	314	12	694	250	500	4,100	126	3,133	89	0	0	15,522	91	4,544	28	-670	28	28,881	3,706	19,000	2,279	233	7,800	1,914	31,226	4,081	75,003	97	-2,345	72,658	**96**	9,875	9,501	**-374**

Table J-4

Projected Chloride Mass Loading and Concentration Changes - Sensitivity Run - Management Zone 6 (Saugus Formation) - CLWA Recycled Water Master Plan - 2012 through 2035

Year	Deep Perc of Precip [acre-ft]	Chloride Conc. for Deep Perc of Precip [mg/L]	Deep Perc from Septic Systems [acre-ft]	Chloride Conc. for Deep Perc from Septic Systems [mg/L]	Applied Water Recharge Outside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Outside West Side Villages [mg/L]	Applied Water Recharge Inside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Inside West Side Villages [mg/L]	Stream Leakage [acre-ft]	Chloride Conc. for Stream Leakage [mg/L]	Castaic Dam Underflow [acre-ft]	Chloride Conc. for Castaic Dam Underflow [mg/L]	Inflow From Acton Basin and Other Upstream Tributaries [acre-ft]	Chloride Conc. for Inflow From Acton Basin and Other Upstream Tributaries [mg/L]	Downward Leakage from Alluvium + Net Lateral Inflow from Adjoining Units [acre-ft]	Chloride Conc. for Downward Leakage from Alluvium + Net Lateral Inflow from Adjoining Units [mg/L]	TOTAL INFLOW [acre-ft]	TOTAL INFLOW MASS of Chloride [tons]	Pumping [acre-ft]	GW Discharge to Streams [acre-ft]	Evapo-trans-piration [acre-ft]	Subsurface Outflow at Blue Cut (County Line) [acre-ft]	Upward Leakage to Alluvium [acre-ft]	TOTAL OUTFLOW [acre-ft]	TOTAL OUTFLOW MASS of Chloride [tons]	Starting Storage [acre-ft]	Starting Concentration [mg/L]	Change in GW Storage [acre-ft]	Ending Storage [acre-ft]	Ending Concentration [mg/L]	Starting Mass in GW Storage [ton]	Ending Mass in GW Storage [ton]	Mass change [tons]
2012	29,070	40	1,254	105	2,787	302	0	687	10	89	0	0	0	0	3,836	93	36,956	3,394	12,841	0	2,499	0	2,751	18,090	821	1,650,000	39	18,866	1,668,866	**39**	86,867	89,441	**2,574**
2013	1,890	40	1,250	105	2,834	302	0	687	0	89	0	0	0	0	-3,706	89	2,269	998	12,814	0	1,571	0	2,649	17,033	829	1,668,866	39	-14,764	1,654,102	**40**	89,441	89,610	**169**
2014	15,703	40	1,250	105	2,882	302	0	687	0	89	0	0	0	0	-1,709	88	18,126	2,014	12,814	0	1,717	0	2,727	17,258	842	1,654,102	40	868	1,654,969	**40**	89,610	90,782	**1,172**
2015	61,979	40	1,250	105	2,929	302	0	687	7	89	0	0	0	0	-578	87	65,587	4,686	12,814	0	3,511	0	2,815	19,140	857	1,654,969	40	46,447	1,701,416	**41**	90,782	94,611	**3,829**
2016	0	40	1,254	105	2,977	302	0	687	0	89	0	0	0	0	-4,266	80	-35	938	12,841	0	2,239	0	2,996	18,076	881	1,701,416	41	-18,111	1,683,305	**41**	94,611	92,793	**57**
2017	0	40	1,250	105	3,025	302	2	687	0	89	0	0	0	0	-6,108	82	-1,831	743	12,814	0	1,545	0	2,821	17,180	862	1,683,305	41	-19,011	1,664,294	**40**	92,793	91,188	**-118**
2018	12,538	40	1,250	105	3,072	302	40	687	0	89	0	0	0	0	-3,421	83	13,480	1,776	12,814	0	1,681	0	2,757	17,252	853	1,664,294	40	-3,772	1,660,523	**41**	91,188	92,111	**923**
2019	1,826	40	1,250	105	3,120	302	140	687	0	89	0	0	0	0	-1,862	84	4,475	1,480	19,123	0	1,378	0	2,000	22,500	1,172	1,660,523	41	-18,026	1,642,497	**41**	92,111	92,419	**308**
2020	7,285	40	1,254	105	3,168	302	264	687	0	89	0	0	0	0	59	85	12,030	2,131	25,281	0	1,338	0	1,391	28,010	1,501	1,642,497	41	-15,981	1,626,516	**42**	92,419	93,049	**630**
2021	0	40	1,250	105	3,215	302	344	687	0	89	0	0	0	0	-1,798	86	3,011	1,611	19,123	0	1,152	0	1,453	21,728	1,177	1,626,516	42	-18,717	1,607,800	**43**	93,049	93,484	**434**
2022	0	40	1,250	105	3,263	302	385	687	0	89	0	0	0	0	17	86	4,915	1,882	25,228	0	997	0	1,064	27,289	1,529	1,607,800	43	-22,374	1,585,426	**44**	93,484	93,837	**353**
2023	15,322	40	1,250	105	3,310	302	404	687	0	89	0	0	0	0	6,827	87	27,114	3,558	34,977	0	1,191	0	649	36,818	2,109	1,585,426	44	-9,703	1,575,722	**44**	93,837	95,286	**1,449**
2024	43,415	40	1,254	105	3,358	302	414	687	10	89	0	0	0	0	13,287	87	61,737	5,878	35,059	0	2,088	0	676	37,823	2,161	1,575,722	44	23,914	1,599,636	**46**	95,286	99,003	**3,717**
2025	37,127	40	1,250	105	3,406	302	420	687	10	89	0	0	0	0	10,964	87	53,176	5,285	12,814	0	2,893	0	1,588	17,295	891	1,599,636	46	35,881	1,635,517	**46**	99,003	103,397	**4,394**
2026	0	40	1,250	105	3,453	302	423	687	0	89	0	0	0	0	2,405	87	7,531	2,278	19,123	0	1,635	0	1,540	22,297	1,306	1,635,517	46	-14,766	1,620,751	**47**	103,397	104,369	**972**
2027	37,522	40	1,250	105	3,501	302	426	687	8	89	0	0	0	0	4,507	90	47,214	4,610	12,814	0	2,728	0	2,230	17,772	969	1,620,751	47	29,442	1,650,193	**48**	104,369	108,010	**3,641**
2028	13,592	40	1,254	105	3,548	302	430	687	0	89	0	0	0	0	1,034	88	19,858	2,903	12,841	0	2,060	0	2,414	17,315	998	1,650,193	48	2,544	1,652,737	**49**	108,010	109,915	**1,905**
2029	3,729	40	1,250	105	3,596	302	434	687	0	89	0	0	0	0	-2,399	89	6,610	1,974	12,814	0	1,729	0	2,419	16,962	1,013	1,652,737	49	-10,351	1,642,385	**50**	109,915	110,876	**961**
2030	46,150	40	1,250	105	3,644	302	437	687	10	89	0	0	0	0	6,011	90	57,502	5,334	12,814	0	3,238	0	2,803	18,855	1,054	1,642,385	50	38,648	1,681,033	**50**	110,876	115,156	**4,280**
2031	0	40	1,250	105	3,691	302	438	687	0	89	0	0	0	0	-3,371	88	2,009	1,704	12,814	0	1,853	0	2,692	17,358	1,062	1,681,033	50	-15,350	1,665,683	**51**	115,156	115,797	**641**
2032	2,747	40	1,254	105	3,739	302	439	687	0	89	0	0	0	0	-4,658	90	3,520	1,704	12,841	0	1,551	0	2,621	17,013	1,075	1,665,683	51	-13,493	1,652,190	**52**	115,797	116,427	**629**
2033	20,140	40	1,250	105	3,787	302	440	687	3	89	0	0	0	0	-1,594	90	24,026	3,045	19,123	0	1,905	0	2,122	23,149	1,497	1,652,190	52	877	1,653,067	**52**	116,427	117,975	**1,548**
2034	0	40	1,250	105	3,834	302	440	687	0	89	0	0	0	0	-4,025	90	1,499	1,675	12,814	0	1,427	0	2,393	16,634	1,085	1,653,067	52	-15,135	1,637,932	**53**	117,975	118,565	**590**
2035	6,825	40	1,250	105	3,882	302	440	687	0	89	0	0	0	0	-4,054	90	8,343	2,058	12,814	0	1,377	0	2,402	16,592	1,101	1,637,932	53	-8,249	1,629,683	**54**	118,565	119,522	**957**

Table J-5

Projected Chloride Mass Loading and Concentration Changes - Sensitivity Run - Management Zone 3 (South Fork Subunit) - All Projects - 2012 through 2035

Year	Deep Perc of Precip [acre-ft]	Chloride Conc. for Deep Perc of Precip [mg/L]	Deep Perc from Septic Systems [acre-ft]	Chloride Conc. for Deep Perc from Septic Systems [mg/L]	Applied Water Recharge Outside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Outside West Side Villages [mg/L]	Applied Water Recharge Inside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Inside West Side Villages [mg/L]	Applied Recycled Water [acre-ft]	Chloride Conc. for Applied Recycled Water [mg/L]	Stream Leakage [acre-ft]	Chloride Conc. for Stream Leakage [mg/L]	Inflow From Upstream Tributaries [acre-ft]	Chloride Conc. For Inflow From Upstream Tributaries [mg/L]	Inflow From MZ2 [acre-ft]	Chloride Conc. for Inflow From MZ2 [mg/L]	Upward Leakage from Saugus + Net Lateral Inflow from Adjoining Units [acre-ft]	Chloride Conc. for Upward Leakage from Saugus + Net Lateral Inflow from Adjoining Units [mg/L]	TOTAL INFLOW [acre-ft]	TOTAL INFLOW MASS of Chloride [tons]	Pumping [acre-ft]	GW Discharge to Streams [acre-ft]	Evapo-trans-piration [acre-ft]	Outflow to MZ4 [acre-ft]	Downward Leakage to Saugus [acre-ft]	TOTAL OUTFLOW [acre-ft]	TOTAL OUTFLOW MASS of Chloride [tons]	Starting Storage [acre-ft]	Starting Concentration [mg/L]	Change in GW Storage [acre-ft]	Ending Storage [acre-ft]	Ending Concentration [mg/L]	Starting Mass in GW Storage [ton]	Ending Mass in GW Storage [ton]	Mass change [tons]
2012	4,214	40	181	95	678	275	0	0	0	500	6,085	65	0	0	292	111	7,741	39	19,192	1,506	0	0	3,696	5,579	6,113	15,388	1,636	25,728	103	3,804	29,532	**86**	3,600	3,470	**-130**
2013	274	40	181	95	679	275	0	0	89	500	737	65	0	0	323	115	7,805	40	10,087	891	0	0	2,366	5,283	5,691	13,340	1,289	29,532	86	-3,253	26,278	**86**	3,470	3,071	**-398**
2014	2,277	40	181	95	670	275	0	0	96	500	4,962	65	0	0	309	113	5,898	40	14,393	1,275	0	0	3,004	4,371	5,819	13,193	1,191	26,278	86	1,200	27,478	**84**	3,071	3,156	**84**
2015	8,986	40	181	95	662	275	0	0	103	500	3,952	65	0	0	321	105	7,949	41	22,154	1,669	0	0	3,654	5,444	5,995	15,094	1,314	27,478	84	7,060	34,538	**75**	3,156	3,511	**355**
2016	0	40	181	95	653	275	0	0	111	500	0	65	0	0	341	111	7,973	41	9,259	834	0	0	2,869	5,612	5,895	14,376	1,170	34,538	75	-5,117	29,421	**79**	3,511	3,175	**-336**
2017	0	40	181	95	645	275	0	0	118	500	0	65	0	0	351	111	6,506	40	7,801	754	0	0	1,336	4,660	5,570	11,566	1,104	29,421	79	-3,766	25,656	**81**	3,175	2,825	**-350**
2018	1,818	40	181	95	636	275	0	0	125	500	3,992	65	0	0	359	107	6,610	41	13,721	1,219	0	0	1,990	4,603	5,635	12,228	1,127	25,656	81	1,493	27,149	**79**	2,825	2,917	**92**
2019	265	40	181	95	628	275	0	0	133	500	718	65	0	0	350	110	8,284	41	10,558	945	0	0	2,032	5,266	6,714	14,012	1,287	27,149	79	-3,454	23,695	**80**	2,917	2,575	**-342**
2020	1,056	40	181	95	620	275	0	0	140	500	2,381	65	0	0	365	107	6,737	42	11,480	1,059	0	0	1,988	4,526	7,631	14,145	1,321	23,695	80	-2,665	21,030	**81**	2,575	2,312	**-263**
2021	0	40	181	95	620	275	0	0	147	500	0	65	0	0	399	106	7,303	43	8,650	838	0	0	1,158	4,606	6,841	12,605	1,259	21,030	81	-3,955	17,075	**82**	2,312	1,892	**-420**
2022	0	40	181	95	621	275	0	0	155	500	0	65	0	0	407	103	7,656	44	9,019	872	0	0	641	4,695	7,299	12,634	1,329	17,075	82	-3,615	13,460	**78**	1,892	1,435	**-457**
2023	2,221	40	181	95	621	275	0	0	162	500	4,160	65	0	0	399	98	7,733	45	15,477	1,379	0	0	1,778	4,860	8,634	15,272	1,439	13,460	78	205	13,664	**74**	1,435	1,375	**-60**
2024	6,294	40	181	95	622	275	0	0	169	500	5,602	65	0	0	415	93	7,784	46	21,067	1,748	0	0	3,291	5,093	9,390	17,773	1,458	13,664	74	3,294	16,959	**72**	1,375	1,665	**290**
2025	5,383	40	181	95	622	275	0	0	177	500	6,749	65	0	0	409	93	9,956	47	23,476	1,953	0	0	3,925	6,385	6,698	17,008	1,285	16,959	72	6,468	23,426	**73**	1,665	2,333	**668**
2026	0	40	181	95	623	275	0	0	184	500	0	65	0	0	382	101	9,740	48	11,110	1,064	0	0	2,752	6,115	6,755	15,622	1,282	23,426	73	-4,512	18,914	**82**	2,333	2,116	**-217**
2027	5,440	40	181	95	623	275	0	0	191	500	6,946	65	0	0	317	98	7,174	48	20,873	1,814	0	0	3,643	5,043	6,144	14,830	1,251	18,914	82	6,043	24,958	**79**	2,116	2,679	**563**
2028	1,971	40	181	95	624	275	0	0	199	500	3,950	65	0	0	306	102	8,915	49	16,144	1,489	0	0	3,258	5,909	5,878	15,046	1,265	24,958	79	1,098	26,056	**82**	2,679	2,903	**224**
2029	541	40	181	95	625	275	0	0	206	500	1,290	65	0	0	295	108	8,093	50	11,229	1,135	0	0	2,680	5,351	5,672	13,703	1,228	26,056	82	-2,474	23,582	**88**	2,903	2,809	**-93**
2030	6,691	40	181	95	625	275	0	0	213	500	6,310	65	0	0	266	104	8,894	51	23,180	1,979	0	0	4,022	6,386	6,317	16,725	1,513	23,582	88	6,455	30,037	**80**	2,809	3,275	**465**
2031	0	40	181	95	626	275	0	0	221	500	0	65	0	0	305	109	8,493	52	9,824	1,048	0	0	2,131	5,727	5,715	13,573	1,247	30,037	80	-3,749	26,289	**86**	3,275	3,076	**-199**
2032	398	40	181	95	626	275	0	0	228	500	988	65	0	0	312	110	8,113	52	10,846	1,146	0	0	1,578	5,357	5,540	12,475	1,275	26,289	86	-1,629	24,660	**88**	3,076	2,947	**-129**
2033	2,920	40	181	95	627	275	0	0	235	500	4,407	65	0	0	314	105	6,391	53	15,075	1,474	0	0	2,214	4,529	6,770	13,513	1,350	24,660	88	1,563	26,223	**86**	2,947	3,071	**124**
2034	0	40	181	95	627	275	0	0	243	500	0	65	0	0	344	109	6,724	54	8,119	967	0	0	1,679	4,641	5,741	12,061	1,216	26,223	86	-3,941	22,281	**93**	3,071	2,822	**-249**
2035	990	40	181	95	628	275	0	0	250	500	2,240	65	0	0	347	108	6,695	55	11,330	1,229	0	0	1,470	4,544	5,450	11,464	1,266	22,281	93	-135	22,147	**92**	2,822	2,785	**-36**

Table J-6

Projected Chloride Mass Loading and Concentration Changes - Sensitivity Run - Management Zone 4 (Santa Clara - Bouquet and San Francisquito Canyon Subunit) - All Projects - 2012 through 2035

Year	Deep Perc of Precip	Chloride Conc. for Deep Perc of Precip	Deep Perc from Septic Systems	Chloride Conc. for Deep Perc from Septic Systems	Applied Water Recharge Outside West Villages	Chloride Conc. for Applied Water Recharge Outside West Villages	Applied Water Recharge Inside West Villages	Chloride Conc. for Applied Water Recharge Inside West Villages	Applied Recycled Water	Chloride Conc. for Applied Recycled Water	Saugus WRP Infiltration	Chloride Conc. for Saugus WRP Infiltration	Stream Leakage	Chloride Conc. for Stream Leakage	Inflow From Upstream Tributaries	Chloride Conc. or Inflow From Upstream Tributaries	Inflow From MZ1	Chloride Conc. for Inflow From MZ1	Inflow From MZ3	Chloride Conc. for Inflow From MZ3	Upward Leakage from Saugus + Net Lateral Inflow from Adjoining Units	Chloride Conc. for Upward Leakage from Saugus + Net Lateral Inflow from Adjoining Units	TOTAL INFLOW	TOTAL INFLOW MASS of Chloride	Pumping	GW Discharge to Streams	Evapo-trans-piration	Outflow to MZ5	Downward Leakage to Saugus	TOTAL OUTFLOW	TOTAL OUTFLOW MASS of Chloride	Starting Storage	Starting Concentration	Change in GW Storage	Ending Storage	Ending Concentration	Starting Mass in GW Storage	Ending Mass in GW Storage	Mass change
	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[mg/L]	[acre-ft]	[tons]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[tons]	[acre-ft]	[mg/L]	[acre-ft]	[acre-ft]	[mg/L]	[ton]	[ton]	[tons]
2012	4,893	40	148	109	567	314	0	885	81	500	4,100	100	11,630	89	0	0	14,829	86	5,579	28	-5,182	28	36,646	4,307	12,832	6,543	1,102	7,025	2,202	29,704	3,738	78,359	96	6,942	85,301	**93**	10,241	10,810	**569**
2013	318	40	147	109	569	314	0	885	89	500	4,100	100	579	89	0	0	14,012	87	5,283	28	-1,853	28	23,243	2,752	12,814	5,290	763	7,327	2,152	28,346	3,495	85,301	93	-5,103	80,198	**92**	10,810	10,066	**-744**
2014	2,643	40	147	109	544	314	0	885	96	500	4,100	100	9,247	89	0	0	14,762	87	4,371	28	-1,307	28	34,603	3,998	18,418	4,129	642	8,008	1,988	33,184	4,085	80,198	92	1,418	81,617	**90**	10,066	9,979	**-87**
2015	10,432	40	147	109	520	314	0	885	103	500	4,100	100	7,519	89	0	0	14,876	85	5,444	28	-2,935	28	40,207	4,155	12,763	6,633	1,215	7,370	2,077	30,058	3,527	81,617	90	10,149	91,766	**85**	9,979	10,608	**628**
2016	0	40	148	109	496	314	0	885	111	500	4,100	100	0	89	0	0	15,133	86	5,612	28	-1,341	28	24,259	2,793	12,755	6,166	1,189	7,743	2,067	29,920	3,321	91,766	85	-5,661	86,105	**86**	10,608	10,080	**-528**
2017	0	40	147	109	472	314	0	885	118	500	4,100	100	915	89	0	0	15,667	87	4,660	28	848	28	26,927	3,027	18,342	3,885	533	8,261	1,907	32,928	3,792	86,105	86	-6,001	80,104	**86**	10,080	9,314	**-765**
2018	2,110	40	147	109	447	314	0	885	125	500	4,100	100	6,575	89	0	0	15,809	86	4,603	28	-1,083	28	32,834	3,748	18,316	3,363	368	8,124	1,874	32,045	3,683	80,104	86	788	80,893	**85**	9,314	9,379	**65**
2019	307	40	147	109	423	314	0	885	133	500	4,100	100	1,229	89	0	0	14,351	85	5,266	28	-3,014	28	22,941	2,758	12,661	3,153	354	7,742	2,770	26,679	3,052	80,893	85	-3,738	77,155	**87**	9,379	9,085	**-294**
2020	1,226	40	148	109	399	314	1	885	140	500	4,100	100	2,842	89	0	0	15,098	84	4,526	28	-549	28	27,931	3,140	18,291	1,993	233	8,101	3,847	32,465	3,795	77,155	87	-4,534	72,621	**85**	9,085	8,430	**-655**
2021	0	40	147	109	400	314	5	885	147	500	4,100	100	1,562	89	0	0	15,548	85	4,606	28	-1,231	28	25,285	2,962	18,265	1,039	145	7,777	2,964	30,191	3,488	72,621	85	-4,906	67,715	**86**	8,430	7,904	**-525**
2022	0	40	147	109	401	314	8	885	155	500	4,100	100	1,744	89	0	0	15,646	85	4,695	28	-1,738	28	25,157	2,999	18,265	446	103	7,575	3,913	30,303	3,525	67,715	86	-5,146	62,569	**87**	7,904	7,378	**-526**
2023	2,579	40	147	109	403	314	10	885	162	500	4,100	100	7,075	89	0	0	15,878	84	4,860	28	-3,762	28	31,453	3,731	18,265	116	59	7,195	5,828	31,464	3,703	62,569	87	-11	62,558	**87**	7,378	7,406	**28**
2024	7,308	40	148	109	404	314	10	885	169	500	4,100	100	11,886	89	0	0	16,430	84	5,093	28	-6,421	28	39,127	4,530	18,291	89	57	6,910	6,185	31,532	3,726	62,558	87	7,595	70,153	**86**	7,406	8,210	**804**
2025	6,249	40	147	109	405	314	11	885	177	500	4,100	100	15,297	89	0	0	16,565	85	6,385	28	-11,665	28	37,671	4,787	12,635	1,542	341	6,661	3,074	24,254	2,798	70,153	86	13,418	83,571	**90**	8,210	10,199	**1,989**
2026	0	40	147	109	406	314	11	885	184	500	4,100	100	1,313	89	0	0	15,076	85	6,115	28	-6,621	28	20,732	2,770	12,635	2,478	340	7,167	3,302	25,923	3,122	83,571	90	-5,191	78,380	**92**	10,199	9,846	**-353**
2027	6,316	40	147	109	408	314	12	885	191	500	4,100	100	18,299	89	0	0	15,461	84	5,043	28	-7,168	28	42,810	5,145	18,265	3,486	848	7,540	2,460	32,599	3,989	78,380	92	10,211	88,591	**91**	9,846	11,003	**1,156**
2028	2,288	40	148	109	409	314	12	885	199	500	4,100	100	5,888	89	0	0	14,581	83	5,909	28	-6,388	28	27,145	3,376	12,653	3,997	959	7,278	2,396	27,283	3,269	88,591	91	-138	88,452	**92**	11,003	11,109	**107**
2029	628	40	147	109	410	314	12	885	206	500	4,100	100	1,018	89	0	0	13,788	83	5,351	28	-3,217	28	22,443	2,709	12,635	4,157	668	7,520	2,351	27,331	3,349	88,452	92	-4,888	83,564	**92**	11,109	10,469	**-640**
2030	7,768	40	147	109	411	314	12	885	213	500	4,100	100	10,596	89	0	0	16,691	87	6,386	28	-6,483	28	39,843	4,597	12,635	6,759	1,511	7,590	2,348	30,844	3,675	83,564	92	8,999	92,564	**91**	10,469	11,392	**923**
2031	0	40	147	109	413	314	12	885	221	500	4,100	100	31	89	0	0	15,167	87	5,727	28	-2,158	28	23,659	2,852	12,635	5,605	949	7,347	2,196	28,733	3,419	92,564	91	-5,073	87,490	**91**	11,392	10,824	**-568**
2032	462	40	148	109	414	314	12	885	228	500	4,100	100	605	89	0	0	14,269	86	5,357	28	-1,941	28	23,653	2,825	12,653	4,630	601	7,722	2,213	27,819	3,367	87,490	91	-4,166	83,324	**91**	10,824	10,282	**-542**
2033	3,390	40	147	109	415	314	12	885	235	500	4,100	100	9,207	89	0	0	14,985	86	4,529	28	-1,642	28	35,378	4,084	18,265	3,599	451	8,143	2,652	33,111	4,030	83,324	91	2,267	85,592	**89**	10,282	10,336	**54**
2034	0	40	147	109	416	314	12	885	243	500	4,100	100	1,291	89	0	0	15,452	86	4,641	28	-826	28	25,475	3,036	18,265	2,424	274	8,055	2,052	31,070	3,719	85,592	89	-5,595	79,996	**89**	10,336	9,652	**-683**
2035	1,149	40	147	109	418	314	12	885	250	500	4,100	100	2,830	89	0	0	15,522	86	4,544	28	-670	28	28,302	3,301	18,265	2,279	233	7,800	1,914	30,492	3,651	79,996	89	-2,190	77,807	**88**	9,652	9,302	**-350**

Table J-7

Projected Chloride Mass Loading and Concentration Changes - Sensitivity Run - Management Zone 6 (Saugus Formation) - All Projects - 2012 through 2035

Year	Deep Perc of Precip [acre-ft]	Chloride Conc. for Deep Perc of Precip [mg/L]	Deep Perc from Septic Systems [acre-ft]	Chloride Conc. for Deep Perc from Septic Systems [mg/L]	Applied Water Recharge Outside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Outside West Side Villages [mg/L]	Applied Water Recharge Inside West Side Villages [acre-ft]	Chloride Conc. for Applied Water Recharge Inside West Side Villages [mg/L]	Stream Leakage [acre-ft]	Chloride Conc. for Stream Leakage [mg/L]	Castaic Dam Underflow [acre-ft]	Chloride Conc. for Castaic Dam Underflow [mg/L]	Inflow From Acton Basin and Other Upstream Tributaries [acre-ft]	Chloride Conc. for Inflow From Acton Basin and Other Upstream Tributaries [mg/L]	Downward Leakage from Alluvium + Net Lateral Inflow from Adjoining Units [acre-ft]	Chloride Conc. for Downward Leakage from Alluvium + Net Lateral Inflow from Adjoining Units [mg/L]	TOTAL INFLOW [acre-ft]	TOTAL INFLOW MASS of Chloride [tons]	Pumping [acre-ft]	GW Discharge to Streams [acre-ft]	Evapo-trans-piration [acre-ft]	Subsurface Outflow at Blue Cut (County Line) [acre-ft]	Upward Leakage to Alluvium [acre-ft]	TOTAL OUTFLOW [acre-ft]	TOTAL OUTFLOW MASS of Chloride [tons]	Starting Storage [acre-ft]	Starting Concentration [mg/L]	Change in GW Storage [acre-ft]	Ending Storage [acre-ft]	Ending Concentration [mg/L]	Starting Mass in GW Storage [ton]	Ending Mass in GW Storage [ton]	Mass change [tons]
2012	29,070	40	1,254	105	2,787	302	0	885	10	86	0	0	0	0	3,836	93	36,956	3,394	12,841	0	2,499	0	2,751	18,090	821	1,650,000	39	18,866	1,668,866	**39**	86,867	89,441	**2,574**
2013	1,890	40	1,250	105	2,834	302	0	885	0	86	0	0	0	0	-3,706	87	2,269	1,007	12,814	0	1,571	0	2,649	17,033	829	1,668,866	39	-14,764	1,654,102	**40**	89,441	89,619	**178**
2014	15,703	40	1,250	105	2,882	302	0	885	0	86	0	0	0	0	-1,709	85	18,126	2,019	12,814	0	1,717	0	2,727	17,258	842	1,654,102	40	868	1,654,969	**40**	89,619	90,796	**1,177**
2015	61,979	40	1,250	105	2,929	302	0	885	7	86	0	0	0	0	-578	84	65,587	4,688	12,814	0	3,511	0	2,815	19,140	857	1,654,969	40	46,447	1,701,416	**41**	90,796	94,627	**3,831**
2016	0	40	1,254	105	2,977	302	0	885	0	86	0	0	0	0	-4,266	78	-35	953	12,841	0	2,239	0	2,996	18,076	881	1,701,416	41	-18,111	1,683,305	**41**	94,627	92,794	**72**
2017	0	40	1,250	105	3,025	302	2	885	0	86	0	0	0	0	-6,108	79	-1,831	770	12,814	0	1,545	0	2,821	17,180	862	1,683,305	41	-19,011	1,664,294	**40**	92,794	91,161	**-91**
2018	12,538	40	1,250	105	3,072	302	40	885	0	86	0	0	0	0	-3,421	79	13,480	1,804	12,814	0	1,681	0	2,757	17,252	853	1,664,294	40	-3,772	1,660,523	**41**	91,161	92,113	**952**
2019	1,826	40	1,250	105	3,120	302	140	885	0	86	0	0	0	0	-1,862	79	4,475	1,528	19,123	0	1,378	0	2,000	22,500	1,172	1,660,523	41	-18,026	1,642,497	**41**	92,113	92,469	**357**
2020	7,285	40	1,254	105	3,168	302	264	885	0	86	0	0	0	0	59	80	12,030	2,202	25,281	0	1,338	0	1,391	28,010	1,502	1,642,497	41	-15,981	1,626,516	**42**	92,469	93,170	**700**
2021	0	40	1,250	105	3,215	302	344	885	0	86	0	0	0	0	-1,798	81	3,011	1,716	19,123	0	1,152	0	1,453	21,728	1,179	1,626,516	42	-18,717	1,607,800	**43**	93,170	93,707	**538**
2022	0	40	1,250	105	3,263	302	385	885	0	86	0	0	0	0	17	81	4,915	1,986	25,228	0	997	0	1,064	27,289	1,532	1,607,800	43	-22,374	1,585,426	**44**	93,707	94,160	**453**
2023	15,322	40	1,250	105	3,310	302	404	885	0	86	0	0	0	0	6,827	81	27,114	3,613	34,977	0	1,191	0	649	36,818	2,116	1,585,426	44	-9,703	1,575,722	**45**	94,160	95,657	**1,497**
2024	43,415	40	1,254	105	3,358	302	414	885	10	86	0	0	0	0	13,287	81	61,737	5,889	35,059	0	2,088	0	676	37,823	2,169	1,575,722	45	23,914	1,599,636	**46**	95,657	99,377	**3,719**
2025	37,127	40	1,250	105	3,406	302	420	885	10	86	0	0	0	0	10,964	82	53,176	5,323	12,814	0	2,893	0	1,588	17,295	895	1,599,636	46	35,881	1,635,517	**47**	99,377	103,805	**4,428**
2026	0	40	1,250	105	3,453	302	423	885	0	86	0	0	0	0	2,405	83	7,531	2,378	19,123	0	1,635	0	1,540	22,297	1,311	1,635,517	47	-14,766	1,620,751	**48**	103,805	104,872	**1,067**
2027	37,522	40	1,250	105	3,501	302	426	885	8	86	0	0	0	0	4,507	86	47,214	4,697	12,814	0	2,728	0	2,230	17,772	973	1,620,751	48	29,442	1,650,193	**48**	104,872	108,595	**3,723**
2028	13,592	40	1,254	105	3,548	302	430	885	0	86	0	0	0	0	1,034	84	19,858	3,013	12,841	0	2,060	0	2,414	17,315	1,004	1,650,193	48	2,544	1,652,737	**49**	108,595	110,604	**2,009**
2029	3,729	40	1,250	105	3,596	302	434	885	0	86	0	0	0	0	-2,399	85	6,610	2,105	12,814	0	1,729	0	2,419	16,962	1,019	1,652,737	49	-10,351	1,642,385	**50**	110,604	111,690	**1,086**
2030	46,150	40	1,250	105	3,644	302	437	885	10	86	0	0	0	0	6,011	86	57,502	5,415	12,814	0	3,238	0	2,803	18,855	1,062	1,642,385	50	38,648	1,681,033	**51**	111,690	116,044	**4,353**
2031	0	40	1,250	105	3,691	302	438	885	0	86	0	0	0	0	-3,371	83	2,009	1,841	12,814	0	1,853	0	2,692	17,358	1,070	1,681,033	51	-15,350	1,665,683	**52**	116,044	116,814	**770**
2032	2,747	40	1,254	105	3,739	302	439	885	0	86	0	0	0	0	-4,658	85	3,520	1,852	12,841	0	1,551	0	2,621	17,013	1,084	1,665,683	52	-13,493	1,652,190	**52**	116,814	117,582	**768**
2033	20,140	40	1,250	105	3,787	302	440	885	3	86	0	0	0	0	-1,594	86	24,026	3,174	19,123	0	1,905	0	2,122	23,149	1,512	1,652,190	52	877	1,653,067	**53**	117,582	119,244	**1,662**
2034	0	40	1,250	105	3,834	302	440	885	0	86	0	0	0	0	-4,025	85	1,499	1,820	12,814	0	1,427	0	2,393	16,634	1,097	1,653,067	53	-15,135	1,637,932	**54**	119,244	119,967	**723**
2035	6,825	40	1,250	105	3,882	302	440	885	0	86	0	0	0	0	-4,054	86	8,343	2,201	12,814	0	1,377	0	2,402	16,592	1,114	1,637,932	54	-8,249	1,629,683	**55**	119,967	121,053	**1,087**