

Section 5: Current Water Supply

This section describes the Department's current water supply options which help meet the water demands of the various pressure zones in the system.

5.1 Current Supply Sources

SBMWD relies solely on water extracted from the underlying aquifer, the Bunker Hill Groundwater Basin (BHG Basin, Basin), to meet its water demands. Currently it receives 100 percent of its water from the Basin. This water is distributed via SBMWD's water distribution system consisting of pipelines, storage reservoirs, pumping stations, hydroelectric generating stations, manual and automatic control valves, fire hydrants, and water meters located throughout 19 individual pressure zones.

In addition to providing water to its customers, SBMWD also delivers water to other agencies. Historically in terms of distribution to others, SBMWD delivers small quantities of water to East Valley Water District (EVWD) for blending purposes due to their water quality issues. EVWD's source of supply exceeds the maximum contaminant level (MCL) established for drinking water standards for nitrate. In return for this water, historically, EVWD has delivered groundwater to SBMWD at a 2.5:1 ratio to compensate the Department for energy costs and production costs associated with the difference in elevation at the point of delivery.

5.1.1 Groundwater

SBMWD currently has 54 groundwater wells located throughout its service area and produces its water supply from these wells. The wells range from 50 to 1,300 feet in depth and have production capacities ranging from 50 to 3,500 gallons per minute (gpm). The Lower Pressure Zone serves as the supply zone for the system, as a majority of the groundwater wells are located in the southern portion of the distribution system in this zone. Due to the increased thickness of the underground aquifer and favorable hydrogeological conditions, this zone has a majority of the wells that are used by the Department. Historical production, previously shown in Table 3-2, is replicated herein as Table 5-1 to reflect the volume of water pumped from the BHG Basin.

5.1.1.1 Groundwater Quality

Groundwater within the Basin is predominately calcium-bicarbonate (USGS 1989) with a TDS averaging less than 350 mg/l (Water Facilities Master Plan WFMP 2007). However, most of the BHG Basin is impaired with one or more contaminants, leading to several contamination plumes. The Redlands plume, located between Judson Street and Mountain View Avenue in Redlands, is primarily composed of TCE, with lower levels of PCE and DBCP, and contaminates approximately 150,000 acre-ft of groundwater. The Newark and Muscoy plumes are spread around the east and west sides of the Shandin Hills in northern San Bernardino. These plumes consist of TCE and PCE, and are designated Superfund sites. Levels of perchlorate slightly exceeding the Maximum Contaminant Level (MCL) are prevalent in a small area near Gilbert St. and Waterman Ave. The perchlorate contamination stems from Chilean fertilizer used in orange groves in and around this area.

Table 5-1: BHG Basin Production

Historical BHG Basin Water Production	
Calendar Year (CY)	Production (Acre-feet/Year)
2001	46,456
2002	48,504
2003	48,522
2004	50,223
2005	48,138
2006	57,392
2007	59,594
2008	57,238
2009	53,490
2010	47,822
2011	48,767
2012	48,757
2013	45,835

Source: SBMWD Water Production data/annual DWR reports.

5.1.1.2 Groundwater Production in the Basin within SBMWD Service Area

SBMWD currently has 54 groundwater wells and produces its water supply from these located throughout its service area. Table 5-2 shows the monthly production of various wells for the year 2012.

Table 5-2: Monthly Water Production 2012 (AF)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% of Total
10th & J St	36	5	35	97	176	279	280	277	271	224	1	1	1680	3.7%
16th & Sierra Way	27	87	77	229	216	229	195	201	230	243	157	151	2042	4.5%
17th Sierra Way	0	0	0	0	0	0	0	4	0	0	0	0	7	0.0%
19th St 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
19th St 2	54	0	0	45	97	90	86	82	75	73	67	66	736	1.6%
27th Acacia	19	10	29	32	59	32	45	55	27	4	8	13	333	0.7%
30th St	1	2	4	1	76	161	236	259	183	1	1	4	928	2.0%
31th St Mt View	1	0	0	0	0	11	16	19	4	0	0	1	54	0.1%
40th Valencia	0	0	0	0	0	0	0	3	5	5	6	7	26	0.1%
7th St	1	1	2	4	6	9	6	8	5	4	0	0	46	0.1%
Antil 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Baseline & Cal	1	0	24	16	35	43	49	13	4	2	0	0	189	0.4%
Cajon 2	69	51	121	74	99	95	94	87	79	74	62	35	940	2.1%
Cajon 3	3	66	74	44	103	108	110	106	100	100	62	1	879	1.9%
Cajon 4	52	136	194	171	177	173	169	160	149	130	146	158	1814	4.0%
Cajon Canyon	0	0	1	1	1	101	92	75	63	59	37	21	453	1.0%
Devil Canyon 1	1	1	73	130	158	184	193	179	164	121	24	83	1312	2.9%
Devil Canyon 2	19	25	16	0	0	107	151	149	136	111	55	25	794	1.7%
Devil Canyon 3	0	0	0	0	0	1	0	0	1	2	4	4	12	0.0%
Devil Canyon 4	4	4	5	4	4	4	4	4	4	2	0	0	37	0.1%
Devil Canyon 5	2	3	24	57	53	57	58	55	52	40	31	2	433	1.0%
Devil Canyon 6	17	15	17	17	17	16	15	16	15	17	11	16	188	0.4%
Devil Canyon 7	7	6	7	6	6	5	5	4	4	4	2	4	59	0.1%
EPA 1	201	185	199	193	188	191	195	189	186	192	187	193	2299	5.1%
EPA 2	235	200	208	204	200	178	184	180	177	184	184	203	2337	5.1%
EPA 3	222	201	239	257	243	188	191	185	212	214	211	249	2613	5.8%
EPA 4	183	153	182	104	214	189	195	191	187	195	211	205	2210	4.9%
EPA 5	0	0	0	0	29	210	215	211	206	198	134	10	1213	2.7%
EPA 6	52	48	53	48	33	52	54	52	50	48	49	53	592	1.3%
EPA 7	171	157	173	147	84	171	175	169	165	173	164	170	1919	4.2%
EPA 108	197	174	197	198	195	193	202	199	195	201	196	203	2350	5.2%
EPA 108S	78	71	82	84	83	83	87	85	83	85	74	75	968	2.1%
EPA 109	136	127	139	132	32	0	0	0	0	0	21	109	696	1.5%
EPA 110	165	146	154	107	71	2	0	0	0	34	94	98	870	1.9%
EPA 111	0	1	0	2	0	0	2	148	145	144	140	144	725	1.6%
EPA 112	157	139	143	135	129	130	127	122	115	115	112	115	1539	3.4%
Gilbert St	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
IVDA NO 11	9	2	0	0	0	0	0	0	0	0	0	0	12	0.0%
Kenwood 1	83	5	105	147	120	65	32	8	0	0	1	21	587	1.3%
Kenwood 2	1	1	3	223	217	166	134	104	96	90	86	105	1225	2.7%
Leroy	1	1	1	2	1	29	54	61	12	1	1	3	167	0.4%
Lynwood	1	3	5	107	171	171	178	134	134	19	1	1	925	2.0%
Lytle Creek 2	71	66	74	71	74	71	73	72	70	72	48	62	826	1.8%
Mallory	62	59	62	73	75	72	73	64	66	69	49	32	754	1.7%
Mill D	43	36	45	43	44	42	43	43	41	43	41	43	505	1.1%
Newmark 1	1	0	3	18	39	49	48	47	45	18	19	0	287	0.6%
Newmark 2	2	2	13	9	147	91	114	193	180	37	18	1	806	1.8%
Newmark 3	124	116	131	129	133	126	124	114	106	109	93	46	1351	3.0%
Newmark 4	2	2	20	102	233	298	294	297	294	143	123	1	1809	4.0%
Olive & Garner	1	1	1	17	88	149	224	218	208	162	107	8	1184	2.6%
Perris Hill 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Perris Hill 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Vincent	1	1	1	2	57	142	124	104	83	98	50	14	677	1.5%
Waterman Av	1	1	4	2	77	178	258	286	203	2	1	4	1018	2.2%
Total	2510	2311	2940	3484	4259	4939	5203	5233	4829	3863	3092	2760	45423	100.0%

5.1.2 Imported Water

As discussed in the above sections, SBMWD currently gets all its water from the BHG Basin. A small amount of imported water can be made available to SBMWD. The source of this water is State Water Project water, purchased from Valley District (Table 5-3, source RUWMP 2012).

Table 5-3: Existing and Planned Wholesale Water Supplies

Wholesale Source	2010	2015	2020	2025	2030	2035
Purchase from Valley District (AF) ^{(a)(b)(c)}	2,000	2,000	2,000	2,000	2,000	2,000

Notes:

(a) Data from 2012 RUWMP.

(b) This table shows supplies expected to be available to SBMWD, depending on water year SBMWD can buy additional supplies.

(c) Data from 2007 IRWMP.

5.1.3 Recycled Water

Currently, SBMWD does not use recycled water within its service area. Wastewater is treated at the San Bernardino Water Reclamation Plant (WRP) to a secondary treatment level and is then conveyed to the Rapid Infiltration Extraction (RIX) Tertiary Treatment Facility in the City of Colton. This facility is jointly owned by SBMWD and the City of Colton and is operated under contract solely by the City of San Bernardino. RIX further treats the wastewater to a tertiary level. All treated effluent from the facility is discharged to the Santa Ana River. A portion of the discharged water, 16,000 AFY, is provided by contract to Valley District to maintain flows in the Santa Ana River fulfilling Valley District's downstream obligations under the Orange County Judgment. The remainder of the discharged amount is excess water, subject to potential reuse.

The RIX Treatment Plant is approximately 300 feet lower in elevation than SBMWD's lowest service area. The combined capital outlay for the required infrastructure to move reclaimed water into the SBMWD's lower pressure zone service area and the operational pumping energy costs limit the cost effectiveness and use of recycled water for the Department. The 2005 UWMP anticipated up to 800 AFY of recycled water use by year 2010. However, SBMWD has not yet implemented a recycled water program, but is actively undertaking design and feasibility studies for the use of this water resource.

Sewer collection systems within SBMWD's service area are not operated by the Department, but rather are operated by various agencies, including: the County of San Bernardino, City of San Bernardino, City of Loma Linda, and EVWD. Collected wastewater is treated at WRP to a secondary treatment level. WRP has a current capacity of 33 MGD or 36,948 AFY, but current average annual flow is approximately 29,000 AFY (SAWPA 2010, RUWMP 2012). In accordance with these studies, Table 5-4 shows existing and anticipated wastewater collection and treatment at the San Bernardino Water Reclamation Plant.

Table 5-4: Current and Projected Wastewater Collection and Treatment

	2010	2015	2020	2025	2030	2035	Disposal Method	Treatment Level
San Bernardino Water Reclamation Plant (AFY)	29,000	30,294	31,645	32,793	33,983	35,216	Flow to RIX	Secondary
RIX (AFY)	33,000	34,472	36,010	37,316	38,670	40,073	Discharge to Santa Ana River	Tertiary

SBMWD's Water Reclamation Division completed a Water Reclamation Report in 2010. Since limited recycled water facilities currently exist in the Department's service area, the focus of this recycled water optimization plan was to explore an effective and efficient means of constructing and distributing recycled water to local customers. The results of this study led to the start of the Department's Clean Water Factory project.

The Clean Water Factory is a project to treat effluent from the San Bernardino Water Reclamation Plant to a quality approved for recharge - as set by the California Department of Public Health (CDPH) and the Santa Ana RWQCB - and convey the recycled water to the Waterman Basins, the East Twin Creek Spreading Grounds, and the Devil Canyon and Sweetwater Basins for surface spreading in the northern portion of the SBMWD service area. Recycled water spread at these facilities will artificially recharge the BHG Basin and, more specifically, the Bunker Hill A Management Zone, as described in the Water Quality Control Plan for the Santa Ana River Watershed (Basin Plan).

The Clean Water Factory will also be designed to treat a side stream of San Bernardino Water Reclamation Plant effluent to a quality approved for direct non-potable use and convey the tertiary treated recycled water to customers that can benefit from a non-potable water supply. With potential expansion in future later phases, the Department estimates that up to 34,200 AFY of recycled water could be generated and used in the SBMWD service area during the planning period. Agencies that are participating in the Clean Water Factory are listed in Table 5-5.

Table 5-5: Recycled Water Plan Participating Agencies

Participating Agencies	Role in Plan Development
Santa Ana RWQCB	Water Quality Regulation/Protection
CDPH	Water Quality Regulation/Protection
Santa Ana Watermaster	Evaluation of Project Against Required Flows
City of Colton	Projections of Future Wastewater Treatment and Reuse Opportunities
County of San Bernardino	Projections of Future Wastewater, Flood Control and Recharge
City of Loma Linda	Projections of Future Wastewater Treatment and Reuse Opportunities
East Valley Water District	Projections of Future Wastewater Treatment and Reuse Opportunities
Bureau of Reclamation	Technical and Financial Assistance
Valley District	Technical and Financial Assistance
Western Municipal Water District	Technical and Financial Assistance
Santa Ana Watershed Project Authority	Technical and Financial Assistance

5.1.3.1 Potential Users

SBMWD is still in the early stages of integrating recycled water in its service area. As described earlier, the primary use of recycled water is anticipated to be groundwater recharge. Other potential uses include non-potable uses in the vicinity of WRP. These existing uses include landscaping at the reclamation plant itself, the San Bernardino Municipal Golf Course, and landscape irrigation by the California Department of Transportation in the vicinity of Interstate 215, Interstate 10, and Highway 210. It is estimated these uses have approximately 840 AFY of current demand. Table 5-6 provides estimates of future recycled water use.

Table 5-6: Potential Recycled Water Use

	2020	2025	2030	2035	2040
Recycled Water Use (AFY) ^(a)	5,600	7,000	13,000	19,600	25,500

Note: (a) Planning level estimates as per RUWMP 2012 adjusted by 5 years as per feedback from Department Staff.

5.1.4 Transfers, Exchanges, and Groundwater Banking Programs

5.1.4.1 Transfers and Exchanges

Water transfers are the voluntary exchange of water between a willing buyer and a willing seller. SBMWD has water exchange and transfer agreements with several of the surrounding agencies on an as-needed basis. Exchanges occur when SBMWD pumps water for another agency and in turn receives water from that agency at a future time and at a specified ratio to account for pumping and delivery costs. Existing interties with other agencies and the capacity of the interties are shown in Table 5-7. Exchanges in the past have occurred during periods of lowered groundwater levels, loss of water by other agencies due to groundwater contamination,

and to facilitate increased pumping in SBMWD's artesian pressure zone to lower groundwater levels that had infiltrated underground utilities. Note that all exchanges are on an as-needed basis and only occur when there is a need and adequate supplies are available within SBMWD's service area.

Table 5-7: Transfer and Exchange Opportunities

Exchange Agency	Transfer or Exchange Direction	Maximum Metered Capability (MGD)
East Valley Water District	Transfer Between	4
City of Riverside	Transfer Between	2
West Valley Water District	Transfer Between	3
City of Loma Linda	Transfer Between	5
City of Colton	Transfer Between	3
City of Rialto	Transfer Between	3.6
Valley District	Transfer Between	5
Riverside Highland Water Company	Transfer Between	3

5.1.4.2 Groundwater Banking Programs

SBMWD does not currently utilize a groundwater banking program.

5.2 Future Water Supply Options

Table 5-8 summarizes the water resources available to SBMWD for the 30-year period as evaluated per the RUWMP, 2012. As shown, SBMWD will continue to receive the majority of its water supply from groundwater (Bunker Hill Basin). In addition, imported and recycled water will provide a small percentage of the future water supply portfolio.

Table 5-8: Summary of Current and Planned Water Supplies (AF)

Water Supply Source	Supply (AF)					
Existing^(a)	2010	2015	2020	2025	2030	2035
Wholesale/Imported	2,000	2,000	2,000	2,000	2,000	2,000
Groundwater	53,940	61,039	66,850	72,664	72,664	72,664
Local Surface Water	0	0	0	0	0	0
Recycled Water	0	0	0	0	0	0
Transfers/Exchanges	0	0	0	0	0	0
Groundwater Banking	0	0	0	0	0	0
Total Existing Supplies	55,940	63,039	68,850	74,664	74,664	74,664
Planned^(a)						
Wholesale/Imported	0	0	0	0	0	0
Groundwater	0	0	0	0	0	0
Local Surface Water	0	0	0	0	0	0
Recycled Water	0	0	7,000	13,000	19,600	25,500
Transfers/Exchanges	0	0	0	0	0	0
Groundwater Banking	0	0	0	0	0	0
Total Planned Supplies	0	0	7,000	13,000	19,600	25,500
Total Existing and Planned Supplies	55,940	63,039	75,850	87,664	94,264	100,164

Notes:

(a) As per RUWMP 2012. Note that SBMWD projects recycled water to come on line in 2018, at a rate of approximately 5,600 AFY