CHAPTER 4

DESCRIPTION OF EXISTING FACILITIES

Santa Clarita Valley Joint Sewerage System

SCVJSS Conveyance System

Solids Processing and Biosolids Management

CHAPTER 4 DESCRIPTION OF EXISTING FACILITIES

SANTA CLARITA VALLEY JOINT SEWERAGE SYSTEM

The SCVJSS provides wastewater conveyance, treatment, and disposal services for residential, commercial, and industrial users in Districts Nos. 26 and 32. The SCVJSS was formed in 1984, when Districts Nos. 26 and 32 signed a Joint Powers Agreement. Under this agreement, the SWRP and VWRP operate as a regional sewerage system. The operating efficiencies of the wastewater treatment plants are optimized as solids and excess wastewater from the SWRP are diverted via a sludge force main and a trunk sewer, respectively, to the VWRP for treatment and disposal. The permitted treatment capacity of the SCVJSS is 19.1 mgd, and the average system flow was 15.0 mgd in 1996.

Saugus Water Reclamation Plant

The SWRP was built in July 1962 to serve District No. 26. The SWRP is located at 26200 Springbrook Avenue, in the Saugus area of Santa Clarita. The SWRP is a tertiary treatment plant consisting of comminution, grit removal, primary sedimentation, flow equalization, activated sludge biological treatment, secondary sedimentation, coagulation, dual inert media filtration, chlorination, and dechlorination. No facilities for solids processing are located at the SWRP. Instead, all wastewater solids are conveyed by either the trunk sewer or the waste activated sludge force main to the VWRP for treatment.

The reclaimed water produced at the SWRP is discharged to the Santa Clara River at a point 40 feet downstream from the Bouquet Canyon Road overpass. Since the Santa Clara River is an aquatic habitat and chlorine can be toxic to aquatic species, the reclaimed water is dechlorinated prior to discharge. At this time, there is no reuse application for reclaimed water produced at the SWRP; however, any reclaimed water that is reused in the future will not require dechlorination.

The SWRP site is considered built out since there is no property available for further expansions. With the addition of flow equalization facilities in 1991, the permitted treatment capacity has been increased to 6.5 mgd. The SWRP is currently treating 5.7 mgd.

Valencia Water Reclamation Plant

The VWRP was built in July 1967 to serve District No. 32 and now serves both Districts Nos. 26 and 32. The VWRP is located at 28185 The Old Road, west of the Golden State Freeway, between the communities of Valencia and Castaic, in unincorporated Los Angeles County. The VWRP is a tertiary treatment plant with solids processing facilities. Current treatment consists of comminution, grit removal, primary sedimentation, flow equalization, activated sludge biological treatment, secondary sedimentation, coagulation, dual inert media filtration, chlorination, and dechlorination. VWRP effluent is discharged to the Santa Clara River and is, therefore, dechlorinated in order to protect the river's aquatic species. At this time, there are only minor reuse applications for reclaimed water produced at the VWRP; nearly all of the reclaimed water is discharged to the river at a point 2,000 feet downstream of The Old Road bridge.

With the completion of structural repairs in early 1997, the permitted treatment capacity of the VWRP is 12.6 mgd. The plant is currently treating 9.3 mgd. In contrast to the SWRP, the VWRP site is not built out. The VWRP site has room for expansion within the footprint of the existing facilities as well as on the undeveloped five-acre parcel at the north end of the site. Chapter 6 includes a complete discussion of expansion potential at the VWRP site.

The VWRP processes all wastewater solids generated in the SCVJSS. Waste activated sludge at the VWRP is combined with waste activated sludge from the SWRP, thickened by dissolved air flotation (DAF) units, blended with VWRP primary solids, and anaerobically digested. The digested sludge is stored and then dewatered using plate and frame filter presses. Currently, the dewatered cake is hauled away for agricultural land application.

Table 4-1 lists the design criteria for the major unit processes at the SWRP and VWRP; Figures 4-1 and 4-2 are process schematics for the WRPs; Figures 4-3 and 4-4 are SWRP and VWRP treatment schematics; and site plans for each WRP are shown in Figures 4-5 and 4-6. Note that existing facilities include those that are being designed or constructed as part of ongoing projects, as well as those currently in operation.

Table 4-1
SUMMARY OF DESIGN CRITERIA FOR THE SCVJSS WRPs

UNIT PROCESS	DESIGN CRITERIA	SWRP	VWRP
Plant Flows	Average	6.5 mgd	12.6 mgd
	Peak Sanitary	11.7 mgd	25.2 mgd
	Peak Storm	14.3 mgd	28.4 mgd
	Influent BOD[a]	270 mg/l	325 mg/l
	Influent Suspended Solids[a]	350 mg/l	445 mg/l
Comminutors	Number	2	3
	Capacity	13.0 mgd	21.5 mgd
Grit Chambers	Number	1	3
	Detention Time @ Peak Sanitary Flow	0.7 min	1.4 min
Primary Sedimentation Tanks	Number	4	9
	Length	60.0 ft	65.0 ft
	Width	20.0 ft	20.0 ft
	Nominal Depth	8.0 ft	11.4 ft
	Overflow Rate @ Avg. Flow	1,350 gpd/sf	1,080 gpd/sf
	Detention Time @ Avg. Flow	1.1 hrs	1.9 hrs
	Overflow Rate @ Peak Sanitary Flow	2,440 gpd/sf	2,150 gpd/sf
	Detention Time @ Peak Sanitary Flow	0.6 hrs	1.0 hrs
Primary Effluent Flow Equalization Basins	Number	2	2
	Volume, Total	1.0 million gal	4.4 million gal
	Maximum Depth	48.0 ft	24.5 ft
	Volume as Percentage of Avg. Daily Flow	15%	35%
Aeration Tanks	Number	3	7
	Length	150 ft	135 ft
	Width	25.0 ft	26.5 ft
	Nominal Depth	15.0 ft	15.0 ft
	Detention Time @ Avg. Flow	4.7 hrs	5.4 hrs
	Detention Time @ Avg. Flow + 1/3 RAS	3.5 hrs	4.0 hrs
Final Sedimentation Tanks	Number	4	8
	Length	140 ft	135 ft
	Width	2 @ 14.0 ft 2 @ 21.0 ft	16 ft
	Nominal Depth	9.0 ft	10.0 ft
	Overflow Rate @ Avg. Flow	660 gpd/sf	730 gpd/sf
	Detention Time @ Avg. Flow + 1/3 Avg. Flow	1.8 hrs	1.8 hrs

Table 4-1 (Continued)
SUMMARY OF DESIGN CRITERIA FOR THE SCVJSS WRPs

UNIT PROCESS	DESIGN CRITERIA	SWRP	VWRP
Filters	Number	4	8
	Type	Pressure	Pressure
	Waste Filter Backwash Flow	0.24 mgd	1.44 mgd
	No. of Backwashes	3 per day	3 per day
	Overall Length	27.8 ft	27.8 ft
	Side Shell Length	24 ft	24 ft
	Diameter	10 ft	10 ft
	Surface Area	240 sf	240 sf
	Surface Loading Rate @ Avg. Flow	4.70 gpm/sf	5.08 gpm/sf
	Surface Loading Rate @ Avg. Flow w/ 1 Filter O/S	6.27 gpm/sf	5.80 gpm/sf
Waste Filter Backwash Equalization Tanks	Number	2	1
	Volume, Total	119,000 gal	83,000 gal
Decant Tanks	Number	—	1
	Length	—	135 ft
	Width	—	16 ft
	Nominal Depth	—	10 ft
	Volume, Each	—	162,000 gal
	Overflow Rate @ Avg. Flow	—	667 gpd/sf
	Detention Time @ Avg. Flow	—	2.7 hrs
Chlorine Contact Tanks	Number	1	3
	Length	80 ft	178 ft
	Width	50 ft	20 ft
	Nominal Depth	16.0 ft	14.6 ft
	Volume, Each	478,720 gal	388,780 gal
	Volume, Total	478,720 gal	1,166,340 gal
	Detention Time @ Avg. Flow	1.8 hrs	2.2 hrs
Dissolved Air Flotation Unit	Small Tank		
	Number	—	2
	Diameter	—	16 ft
	Area	—	200 sf
	Large Tank		
	Number	—	1
	Diameter	—	25 ft
	Area	—	490 sf
	Average WAS Flow	—	0.36 mgd
	Average Solids	—	760 lb/hr
	Hydraulic Load Rate @ Avg. Flow	—	0.28 gpm/sf
	Solids Load Rate @ Avg. Flow	—	0.85 lb/hr/sf
Anaerobic Digesters	Number of Digesters	—	6[b]
	Total Digester Influent	—	0.15 mgd
	Total Liquid Depth	—	38.4 ft
	Side Water Depth	—	26.0 ft
	Total Conical Depth	—	13.0 ft
	Diameter	—	65.0 ft
	Working Volume per Unit	—	86,267 cf
	Detention Time Using Working Volume	—	21.5 days
	Det. Time Using Work. Vol. w/ 1 Digester O/S	—	17.2 days

Table 4-1 (Continued)
SUMMARY OF DESIGN CRITERIA FOR THE SCVJSS WRPs

UNIT PROCESS	DESIGN CRITERIA	SWRP	VWRP
Plate and Frame Filter Presses	Number of Presses	—	2
	Volume, Each	—	330 cf
	Overall Cycle Time	—	2.0 hrs
	Avg. Sludge Flow	—	210,000 gal
	Digested Sludge Suspended Solids	—	2.6%
	Daily Solids	—	46,000 lbs
	Avg. Solids in Cake	—	26%
	Avg. Solids per Run	—	5,400 lbs
	Cake Tonnage	—	88 tons
Filtrate Equalization Tank	Number	—	1
	Length	—	100 ft
	Width	—	20 ft
	Maximum Water Depth	—	13.5 ft
	Volume	—	200,000 gal

Notes: a) Design criteria take into consideration temporal variations in influent concentrations and, therefore, may differ from annual mean concentrations.
b) One digester is used for storage of digested sludge.

SCVJSS CONVEYANCE SYSTEM

The wastewater conveyance system for Districts Nos. 26 and 32 consists of an interconnected network of trunk sewers, local lines, a pumping plant, an interceptor, and a waste activated sludge force main. The system conveys wastewater and wastewater solids to and between the treatment plants of the SCVJSS. Reclaimed water produced by the WRPs is discharged via separate outfalls into the Santa Clara River. Figure 4-7 shows the major components of the SCVJSS conveyance system. Further discussion of the conveyance system is provided in Chapters 5 and 6.

Trunk Sewers

An approximately 34-mile long network of trunk sewers form the backbone of the SCVJSS conveyance system. Trunk sewers with diameters less than 24 inches are generally made of vitrified clay pipe (VCP), which is resistant to sulfide corrosion. Larger diameter sewer lines (up to 42 inches in diameter in the SCVJSS) are typically built with reinforced concrete pipe (RCP).

The Districts are responsible for the construction, operation, and maintenance of trunk sewers. Sewer flow-levels and sewer conditions are generally checked biennially, and a recommendation is made as to whether relief, repair, or replacement of the sewers is required. Districts Nos. 26 and 32 trunk sewers were last inspected in 1996. The 1996 inspection determined that all SCVJSS trunk sewers are in satisfactory condition, and that repair is not necessary. However, relief of a portion of the District No. 32 Main was identified as a high priority. Table 4-2 provides a summary of capacity utilization as of 1996 for the trunk sewers within the service area of Districts Nos. 26 and 32.

Table 4-2

1996 FLOWS FOR THE TRUNK SEWERS WITHIN DISTRICTS NOS. 26 AND 32

TRUNK SEWER	PERCENT OF CAPACITY UTILIZED[a]
Bouquet Canyon Trunk	Dry
Bouquet Canyon Relief	40
District No. 26 Interceptor	25-70
San Fernando Road Trunk	20
Soledad Canyon Trunk	30-70
Soledad Canyon Relief	40-50
Avenue Scott Trunk	10
Castaic Trunk	30-50
District No. 32 Main Trunk	70-90
District No. 32 Main Relief	15
Newhall Trunk	50
Rye Canyon Trunk	10
Valencia Trunk	50-75

Note: a) A range of percentages indicates significant variations in utilized capacity at different locations within a given trunk sewer.

Local Lines

Local lines are sewers that feed into the SCVJSS trunk sewers. Diameters of local lines generally do not exceed 15 inches. The City of Santa Clarita owns the local lines within its borders, and Los Angeles County owns the majority of the local sewers located in unincorporated areas. The Los Angeles County Consolidated Sewer Maintenance District (CSMD) operates and maintains the local lines owned by the City of Santa Clarita and Los Angeles County. Local lines typically convey wastewater from a user's property line to the trunk sewers, and it is the responsibility of the user to connect to the local line.

Castaic Pumping Plant

Ideally, a conveyance system is designed so that wastewater can flow by gravity to the treatment facilities. However, regional topography often requires the operation of pumping plants. In 1971, District No. 32 built the Castaic Pumping Plant, located one mile northwest of the VWRP, to serve the users in the Castaic area. District No. 32 continues to operate and maintain the Castaic Pumping Plant. The pumping plant has a capacity of 5.0 mgd, and wastewater is pumped to the VWRP via a 16-inch force main.

District No. 26 Interceptor and Waste Activated Sludge Force Main

Recognizing that space limitations at the four-acre SWRP would severely limit future expansion, District No. 26 built an interceptor trunk sewer in 1981 to convey flow to the VWRP. This 30-inch RCP interceptor sewer transfers a portion of the flow received at the SWRP to the VWRP. In addition, the SWRP typically diverts primary solids through the interceptor and has the option of using the interceptor to convey secondary waste activated sludge.

A separate force main connecting the two plants was built in 1984. The 6-inch ductile iron force main conveys waste activated sludge from the SWRP to the VWRP for solids processing.

SOLIDS PROCESSING AND BIOSOLIDS MANAGEMENT

Solids Processing

As mentioned previously, all solids produced in the SCVJSS are processed at the VWRP. Solids and skimmings from the primary treatment process at the SWRP are diverted to the interceptor sewer linking the two plants and processed along with VWRP influent. Primary solids and skimmings at the VWRP proceed directly to the digesters without further thickening. Waste activated sludge from the SWRP is conveyed to the VWRP via a force main and combined with VWRP waste activated sludge. The combined waste activated sludge is thickened using DAF units and then anaerobically digested. Digesters are maintained at about 96°F, and the average

detention time of solids in the digesters is approximately 22 days. Methane gas produced during digestion is utilized by a cogeneration process that heats water (used to maintain proper digester temperature) and produces electricity. The digested solids are conditioned with polymer and ferric chloride and then dewatered by plate and frame filter presses. The dewatered cake produced by the filter presses is currently averaging about 27 percent solids. The solids in this form are called biosolids.

Biosolids Management

Prior to March 20, 1995, all biosolids generated at the VWRP were co-disposed with municipal solid waste at the Chiquita Canyon Landfill. The biosolids have since been land-applied by Pima Gro Systems, Inc. of Redlands, California, for agricultural purposes. Pima Gro Systems transports biosolids from the VWRP using trucks, then applies and incorporates the biosolids in farmland in Kern County. The land application areas are pre-approved by the Central Valley RWQCB and are used to grow feed and fiber crops.

In compliance with 40 CFR Part 503, annual biosolids monitoring reports are submitted to the U.S. Environmental Protection Agency. The most recent report for the VWRP, submitted in February 1997, contains biosolids treatment, quantity, monitoring, and quality data for 1996. In 1996, the SCVJSS generated 15,310 wet tons of biosolids, which was equivalent to 4,180 dry tons. Volatile solids destruction averaged 53 percent and metals concentrations were within the allowable limits. Chapter 5 provides additional information regarding biosolids characteristics.