

Water Supply

7.1 Introduction

This section describes the proposed water supply source for the Vernon Power Plant (VPP). It includes a discussion of water requirements for the plant, including the source and use of recycled water, as well as the quality of the recycled water. It also presents the source and uses of potable water. In addition, it addresses permits and permitting agencies. Note that because recycled and potable water are available in Boyle Avenue, adjacent to the project site, no linear water pipelines are needed, and no alternative routes were analyzed.

7.2 Water Requirements

Recycled water, supplied by the Central Basin Municipal Water District (CBMWD), will be used for cooling and industrial processes. Potable water for drinking, safety showers, service water, fire suppression, and sanitary uses will be provided from the City of Vernon's potable water system. The water requirements for VPP are presented in Table 7.2-1. Figures 2.2-6a and 2.2-6b illustrate the expected average and peak recycled water use, respectively. Average water use is based on full plant output at ambient conditions of 65 degrees Fahrenheit (°F) and 60 percent relative humidity. Under these annualized conditions, VPP would require approximately 6,266 acre-feet of water per year (afy). Instantaneous peak water use is based on full plant output at ambient conditions of 105°F and 35 percent relative humidity. Almost all of the water used would be for cooling. Additional information about Water Resources is provided in Subsection 8.14.

TABLE 7.2-1
Daily and Annual Water Use for VPP Operations

Water Use	Water Source	Daily Use (gpm ^a)		Annual Use (afy ^b)
		Average	Peak	
Recycled Water	Central Basin Municipal Water District	3,885	5,000	6,266
Potable Water	City of Vernon	0.21	30	0.34

^a gpm = gallons per minute

^b afy = acre-feet per year (based on an annual operation of 8,760 hours/year at full plant output, duct firing and evaporative cooling at 65°F)

7.3 Recycled Water Supply

All water demands for cooling and other industrial processes would be met by recycled water, supplied by CBMWD, which is highly treated and disinfected to meet the requirements specified in Title 22 of the California Code of Regulations. The Title 22 recycled water will be primarily used for the cooling tower (roughly 96 percent of water

consumption). Treated recycled water also will be used for evaporative cooling of air entering the gas turbines and makeup water for the Heat Recovery Steam Generators (HRGSs).

7.3.1 Central Basin Municipal Water District

CBMWD was formed in 1954 in response to overpumping of the Central Groundwater Basin. It wholesales imported water and recycled water to municipalities and other water retailers in its service area to balance pumping from the groundwater basin. With more than 200 site connections to its recycled water system, CBMWD is projected to deliver 5,000 afy both inside and outside of its service area in fiscal year 2005-06. Projected recycled water use, including use by other purveyors within the CBMWD service area, is shown in Table 7.3-1. CBMWD purchases recycled water from both the Los Coyotes and San Jose Creek Water Reclamation Plants (WRPs), operated by the Sanitation Districts of Los Angeles County (LACSD) for distribution within its service area. The WRPs together produce approximately 137 million gallons per day (mgd) of tertiary-treated effluent, nearly 40 percent of which CBMWD and agencies within the service area reused in 2000. Overall recycled water supplies available to CBMWD are expected to reach 17,900 afy by 2030.

TABLE 7.3-1
Projected Recycled Water Used within Central Basin Service Area (in acre-feet)

	2005 ^a	2010	2015	2020	2025	2030
Central Basin						
Century/Rio Hondo Projects	3,150	10,500	11,750	13,000	14,250	15,500
Other Providers within Central Basin						
City of Cerritos	1,714	1,950	1,950	1,950	1,950	1,950
City of Lakewood	352	450	450	450	450	450
Water Replenishment District of Southern California	50,000	50,000	50,000	50,000	50,000	50,000
Subtotal	52,066	52,400	52,400	52,400	52,400	52,400
Central Basin's Service Area Total	55,216	62,900	64,150	65,400	66,650	67,900

^a The 2005 levels are based on the 2004-05 year, which is also considered one of the "wettest" years on record.

Source: CBMWD, 2005.

Currently, the primary use of CBMWD recycled water supply is landscape irrigation, accounting for approximately 66 percent of total use. The CBMWD Urban Water Management Plan anticipates the percentage of industrial users to increase, primarily as a result of the Malburg Generating Station (MGS) and VPP projects. CBMWD and the City of Vernon have entered into an agreement for the purchase and use of up to 13,500 afy of recycled water (Agreement No. 05-130). This agreement addresses planned improvements to the CBMWD recycled water conveyance system, which are described in Subsection 7.3.2, below. Agreement No. 05-130 is provided in Appendix 7A.

As shown in Table 7.3-1, CBMWD delivered 3,150 af of recycled water in the 2004-05 fiscal year. Breakdowns of these recycled water sales by user and by type are shown in Tables 7.3-2 and 7.3-3, respectively.

TABLE 7.3-2
CBMWD Recycled Water Sales (Fiscal Year 04-05)

Retail Customer	Amount (acre-feet)
Bellflower-Somerset Mutual	108
City of Cudahy	56
City of Downey	617
City of Huntington Park	49
City of Lynwood	46
City of Norwalk	53
City of Paramount	360
City of Pico Rivera	28
City of Santa Fe Springs	630
City of South Gate	213
City of Whittier	66
Park Water Company	341
Peerless Water Company	16
San Gabriel Valley Water Company	48
Southern California Water Company	523
Upper San Gabriel Valley Municipal Water District	45
Total	3,150

Source: CBMWD, 2005.

TABLE 7.3-3
CBMWD Recycled Water Uses (Fiscal Year 04-05)

Type of Use	Amount (acre-feet)
Irrigation	2,654
Commercial	0
Industrial	496
Total	3,150

Source: CBMWD, 2005.

7.3.2 Southeast Water Reliability Project

The recycled water will be delivered to VPP through a recycled water pipeline located in Boyle Avenue adjacent to the site that is used to deliver recycled water to MGS. However, to provide sufficient volume CBMWD's distribution system must be improved. Currently, the recycled water is supplied from the San Jose Creek WRP (via CBMWD's Rio Hondo pump

station) and the Los Coyotes WRP (via CBMWD’s Century pump station). Recycled water users in the Vernon area rely heavily on the Century pump station. The number of industrial users in Vernon will eventually increase the demand for recycled water to more than 1.5 billion gallons annually, which would exceed the available capacity at the Century pump station. With additional capacity available at the Rio Hondo pump station, CBMWD proposes to increase the level of connectivity within the distribution system and thus equalize the burden between the Century and Rio Hondo pumping stations. This project, called the Southeast Water Reliability Project, includes a 10-mile-long, 42-inch pipeline connecting the existing system in Vernon to another part of the system in the nearby city of Pico Rivera. With the completion of the Southeast Water Reliability Project, CBMWD will be able to provide additional water to Vernon as well as target potential future customers (see Appendix 7A, for a “will serve” letter from CBMWD). CBMWD has committed to complete the Southeast Water Reliability Project prior to start of the VPP commissioning phase so that recycled water will be available for the plant’s use. The Southeast Water Reliability Project is being implemented by CBMWD to improve its overall delivery network and is not part of the VPP project.

7.4 Recycled Water Quality

Table 7.4-1 summarizes the quality of recycled water from CBMWD’s existing recycled water system. Constituents selected for inclusion are based on the industrial waste discharge requirements of LACSD – the agency receiving wastewater from the project, which limits the inflows to its system of the constituents listed in Table 7.4-1.

TABLE 7.4-1
Recycled Water Quality

Parameter	Concentration (mg/L)*
Cyanide (total)	0.006
Arsenic	0.001
Cadmium	0.00002
Chromium (total)	0.0285
Copper	0.031
Lead	0.001
Mercury	0.00004
Nickel	0.0465
Silver	0.000154
Zinc	0.051
pH	7.17 (pH units)
Temperature	78.5 (°F)

* mg/L = milligrams/liter

Source: CBMWD, 2005.

Water quality will change as recycled water is used for industrial processes, primarily as a result of concentration in the cooling towers. Cooling water treatment will require the addition of chemicals, such as: a pH control agent like sulfuric acid, a mineral scale dispersant such as polyacrylate polymer, a corrosion inhibitor (phosphate based), and a biocide such as sodium hypochlorite. See Subsection 8.14, Water Resources, for a discussion of effluent water quality.

7.5 Potable Water

7.5.1 Construction

The source of water for construction-related activities such as dust control, soil compaction, and concrete curing will be potable water supplied by the City of Vernon. The other possible water supply considered for construction was recycled water from CBMWD. The use of potable water is preferred over CBMWD's recycled water because sufficient recycled water will not be available until the Southeast Water Reliability Project is completed.

The amount of water used for dust and erosion control is anticipated to be 87 acre-feet during the construction period, and the amount of water for equipment washing is expected to be 0.07 acre-foot during the construction period. Prior to plant start-up, additional water (estimated to be 0.34 acre-foot) will be used for hydrostatic testing.

7.5.2 Operations

Potable water for drinking, safety showers, fire protection water, service water, and sanitary uses will be provided from the City of Vernon's potable water system using existing water lines in Boyle Avenue. A "will serve" letter from the City is provided in Appendix 7B. Potable water use is included in Table 7.2-1. In addition, potable water will be used as an emergency supply for cooling and other industrial uses should the recycled water supply be interrupted for longer than 8 hours. The 2-million-gallon onsite storage capacity for recycled water will accommodate 8 hours of uninterrupted plant operations once recycled water from CBMWD is unavailable. Therefore, use of potable water for industrial purposes would only occur if recycled water is unavailable for periods longer than 8 hours.

7.6 Permits and Permitting Agencies

A summary of the permits required and the permitting agencies for water use is shown in Table 7.6-1. See Table 8.14-7 for additional permits related to water resources.

TABLE 7.6-1
Permits and Permitting Agencies for VPP Water and Wastewater

Permit	Schedule	Agency
Application of Service for Potable Water	30 days prior to the start of construction.	City of Vernon 4305 Santa Fe Avenue Vernon, CA 90058 Contact: Kevin Wilson, Director of Community Service & Water Department (323) 583-8811

7.7 Reference

City of Vernon. 2001. Application for Certification – Malburg Generating Station Project (01-AFC-25). Submitted to the California Energy Commission December 21.

Central Basin Municipal Water District (CBMWD). 2006. “Southeast Water Reliability Project” from their website at:

http://www.centralbasin.org/currproj_southeast_water_reliability.php

CBMWD. 2005. 2005 Urban Water Management Plan.