4 GROUNDWATER

4.1 El Capitan Management Area

4.1.1 Description of Groundwater Resources

No significant alluvial groundwater aquifers exist within the El Capitan Management Area (Figure 1-5). Instead, groundwater resources within the El Capitan Management Area are principally developed from fractured rock. Fractured crystalline rock occurs throughout the El Capitan Management Area and includes granitic, igneous, and metamorphic rocks.

Recharge to fractured rock is derived from streamflow infiltration, precipitation percolation, and applied water. Because of the irregularity of fractures, however, it is often difficult to identify the exact source of recharge or determine the total amount of groundwater in storage in any given location. No published groundwater storage estimates exist for the El Capitan Management Area. CSDWA (1997), however, reports the following general characteristics for fractured rock aquifers.

Variability of fracture extent, density, and orientation leads to highly varied well yields. Minor changes in horizontal or vertical position of well screens can cause a dramatic change in yield, and nearby wells may not necessarily tap into the same set of saturated rock fractures. Well yields typically are several gallons per minute (gpm), but can be as high as 100 gpm. Aquifer depths may be great (more than 1,000 feet) but fractures are typically more common in the upper several hundred feet. Aquifer storage coefficients are extremely small, generally on the order of 0.1 percent or smaller.

Long-term yields of wells may be limited by the small amount of aquifer storage within the fractures or by the availability of local recharge.

Shallow alluvium/residuum deposits also occur within the El Capitan Management Area, and are principally located along key tributary streams and valleys. In such areas, the shallow alluvium/residuum is typically hydraulically connected to underlying fractured rock, and wells screened over wide depths may simultaneously withdraw groundwater from both aquifers.

4.1.2 Groundwater Use and Monitoring

With the exception of the community of Alpine, groundwater serves as the exclusive source of water supply within the El Capitan Management Area. Outside of Alpine, residences and businesses within the El Capitan Management Area receive water service via individual wells, wells connected to public water systems (PWS), or wells connected to non-PWS. Groundwater also serves as a source of water supply within the Capitan Grande Indian Reservation. A number of public water agencies and private water companies exist within the El Capitan Management Area. Section 116275 of the California Health and Safety Code defines a "public water system" as a water system that has more than 15 service connections that serves 25 or more residents at least 60 days of each year. Community water systems (CWSs) are defined as PWSs that serve at least 25 year-round residents. The DHS regulates CWSs that have more than 200 or more service connections. DHS-regulated CWSs within the El Capitan Management Area that utilize groundwater as an exclusive source of supply include the following:

Julian Community Services District. The Julian Community Services District operates a number of groundwater wells to serve customers in the community of Julian.

Majestic Pines Community Services District. The Majestic Pines Community Services District serves approximately 600 metered customers east of Julian, but the majority of the Majestic Community Services District is outside the boundary of the SDRW.

Pine Hills Mutual Water Company. The Pine Hills Mutual Water Company develops groundwater supply from four wells to serve more than 200 customers in the Pine Hills area approximately 3 miles southwest of Julian.

CWSs within the El Capitan Management Area that utilize groundwater as an exclusive source of supply but have 199 or fewer service connections are regulated by the DEH, and include the following:

Cuyamaca Water District. The Cuyamaca Water District provides water to a service area located near Lake Cuyamaca. The District serves approximately 130 metered connections with groundwater developed from three wells.

H&J Water Company. The private H&J Water Company serves approximately 35 customers within a service area adjacent to William Heise County Park, south of Julian.

North Peak Mutual Water Company. The North Peak Mutual Water Company serves approximately 190 metered properties with groundwater developed from four wells.

Richardson Beardsley Mutual Water Company. The Richardson Beardsley Mutual Water Company provides groundwater supply to residents within a service area located in the Pine Hills area of Julian.

Wynola Water District. The Wynola Water District operates nine wells and serves more than 50 metered properties in the community of Wynola, located approximately 2 miles west of Santa Ysabel.

DEH also regulates water systems within the El Capitan Management Area that are defined under the California Health and Safety Code as Transient Non-Community (TNC) water systems and State Small Water Systems. A TNC water system is a PWS that is not a CWS, but serves 25 or more persons at least 6 months each year. TNC water systems regulated by DEH within the El Capitan Management Area that utilize groundwater as an exclusive source of supply include:

- Angels Landing (north of Julian)
- Apple Tree Inn (Wynola, east of Santa Ysabel)
- Camp Hual-Cu-Cuish (south of Julian)
- Camp Marston/Raintree YMCA (Pine Hills, south of Julian)
- Camp Winacka (Pine Hills, south of Julian)
- Coleman Creek Village (Julian)
- Heise County Park (south of Julian)
- Julian Youth Academy (south of Julian)
- Lake Cuyamaca Park & Recreation (Cuyamaca, south of Julian)
- Lakeland Resort (south of Julian)
- Los Tres Amigos (east of Julian)
- Phoenix Academy (Sherilton Valley, north of Descanso)
- Pinezanita Trailer Ranch (east of Julian)
- Spencer Valley School (east of Julian, west of Santa Ysabel)

- Stallion Oaks Ranch (northwest of Descanso)
- Whispering Oaks Program Center (Pine Hills, south of Julian)
- Whispering Winds (Harrison Park, south of Julian)
- Wynola Bible Conference (Wynola, east of Julian)
- Wynola Coffee Company (Wynola, east of Julian)
- Wynola Point (Wynola, east of Julian)

State Small Water Systems are non-PWSs that serve from 5 to 14 service connections, but do not serve water to more than 25 persons more than 60 day each year. State Small Water Systems regulated by DEH within the El Capitan Management Area that utilize groundwater as an exclusive source of supply include:

- Cuyamaca Forest Mutual Water (Cuyamaca, south of Julian)
- Harrison Park Mutual Water Company (Harrison Park, south of Julian)
- Iron Springs Water Company (Harrison Park, south of Julian)

In addition to public and non-PWS within the El Capitan Management Area, groundwater provides the exclusive source of water supply to virtually all individual homes and businesses outside of the Alpine area. While no surveys of groundwater wells have been performed in the El Capitan Management Area, population data indicate that several hundred private fractured rock groundwater wells may exist within the management area. With private wells developing an average of one-quarter to one-half acre-feet per year (AFY) each, and public agency wells developing more, total groundwater pumped by private well owners in the upper El Capitan Management Area may be several hundred AFY.

Routine water quality monitoring of private groundwater wells is not required, but DHS and DEH requires PWSs to monitor public water supply wells for quality and notify customers if testing indicates non-compliance with drinking water standards. DHS monitoring requirements are typically based on water system size. Monitoring for larger water systems may only involve once-in-three-year monitoring for many constituents (Anchor 2003[1]). Monitoring requirements for smaller water systems (such as those in the El Capitan Management Area) are typically focused on bacteriological monitoring and provide little (or infrequent) information on other constituents.

Additionally, no central water quality data base exists for tested groundwater, and no agency coordination or communication exists.

4.1.3 Nitrate Issues

Nitrate in groundwater principally occurs through wastewater plant percolation discharges, septic tank discharges, and irrigation recharge from fertilized areas.

Within the El Capitan Management Area, only portions of the communities of Alpine and Julian are connected to sewer systems. Sewer service within Alpine is provided by the Alpine Sanitation District, which exports wastewater to the San Diego Metropolitan Sewerage System. Julian is served by the Julian Sanitation District, which operates a wastewater treatment plant. Treated wastewater is used to irrigate surrounding lands.

Wastewater service within the remainder of the El Capitan Management Area is provided exclusively by septic tanks.

Large-scale agricultural production does not occur within the El Capitan Management Area due to the limited amount of private land (much of the area is national forest or reservation land), and lack of reliable irrigation supplies. Irrigated agriculture is primarily limited to the Julian area in the extreme northeast portion of the El Capitan Management Area.

No organized testing of private water wells exist within the El Capitan Management Area. All PWSs, however, are required to notify water customers if groundwater testing reveals noncompliance with DHS drinking water standards.

While no systematic groundwater quality data are available within the El Capitan Management Area, the nature of fractured rock aquifers indicates that groundwater quality is likely to be highly variable. Water quality within individual wells would be influenced by such factors as well location, well screen depth, and recharge sources. Because of the highly variable nature of fractured rock aquifers, no published California Department of Water Resources (CDWR) or other studies of groundwater quality within the El Capitan Management Area are available.

It is possible that individual wells exist within the El Capitan Management Area that may be influenced by nearby nitrate sources. The lack of large-scale nitrate loads within the area, however, suggests that no regional groundwater nitrate compliance problems exist within the El Capitan Management Area.

4.1.4 TDS

Because of the highly varied nature of fractured rock aquifers, a significant degree of variability in groundwater TDS concentrations are likely within the El Capitan Management Area. No published groundwater studies or recent groundwater quality monitoring data, however, are available to describe current TDS concentrations within the El Capitan Management Area.

Basin Plan groundwater TDS objectives for the Boulder Creek and Conejos Creek portions of the El Capitan Management Area are 350 mg/L. While groundwater quality can be highly variable in fractured rock aquifers and no systematic groundwater quality data base is available, historic groundwater quality presented by CDWR (1967) indicates that the Basin Plan groundwater quality TDS objectives are likely to be representative of typical groundwater TDS concentrations within the El Capitan Management Area. The lack of imported water supplies, of large-scale development, of large-scale agriculture, and of other salt load sources within the El Capitan Management Area is likely to result in less mineralization (increase in TDS concentrations) than in downstream portions of the SDRW.

4.1.5 Assessment of Quality and Quantity of Groundwater

Little information exists to assess the quality and quantity of groundwater within the El Capitan Management Area. While specific yields of fractured rock aquifers are low, the large areal extent of the aquifers may result in a significant quantity of groundwater being stored within the El Capitan Management Area. For any individual well, however, groundwater use would be limited by such local conditions as individual well yields, storage in fractures contiguous to the well, and sources and rates of groundwater recharge. As noted above, with the exception of a portion of Alpine, virtually all development within the El Capitan Management Area is served by groundwater wells. Total current annual groundwater consumptive use within the El Capitan Management

Area may thus be on the order of several hundred AFY. Because of the fractured rock nature of the aquifer, hydrogeologic responses to groundwater pumping can be highly variable from location to location within the El Capitan Management Area. In zones where groundwater pumping approaches or exceeds the available local recharge, declining water table elevations can occur that potentially can result in impacts to well owners, impacts to groundwater-dependent vegetation, and reductions in surface stream base flows.

Groundwater quality within fractured rock wells is typically highly variable, but no published source of groundwater quality data is available to characterize current groundwater quality within the El Capitan Management Area. The lack of significant salt loads and historic groundwater quality data, however, suggest that TDS concentrations are typically low to moderate. As a result of sparse development patterns and lack of large-scale nitrate sources, no regional nitrate groundwater quality problems are believed to occur within the El Capitan Management Area.

4.2 San Vicente Management Area

4.2.1 Description of Groundwater Resources

There are no significant groundwater aquifers in the San Vicente Management Area. (Figure 1-5) Groundwater resources within the San Vicente Management Area are principally developed from shallow alluvium/residuum and/or fractured rock. Shallow alluvium/residuum exists along major tributary streams in the San Vicente Management Area, including San Vicente Creek and Padre Barona Creek. Fractured crystalline rock occurs throughout the San Vicente Management Area. Recharge to the shallow alluvium/residuum and fractured rock aquifers is from percolation from streamflow infiltration, percolation of precipitation, and percolation from applied waters.

4.2.2 Groundwater Use and Monitoring

RMWD provides water supply throughout much of the northern portion of the San Vicente Management Area. The RMWD water supply largely consists of imported water, but may also include local supplies developed from outside the SDRW. A number of residences within the RMWD service area, however, rely on wells as a source of groundwater supply. A portion of the City of Poway is within the San Vicente

Management Area where imported water is available. Groundwater provides the exclusive source of water supply for remaining developed areas of the San Vicente Management Area, including portions of Wildcat Canyon and the entire Barona Valley. No surveys of groundwater wells have been performed in the San Vicente Management Area. Water agency supply records and population data, however, indicate that hundreds of private groundwater wells exist within the management area. While no collective data are available on the quantity of groundwater developed by the wells, typical residential water uses and well yields from similar aquifers indicate that total groundwater production by the private wells may be many hundreds of AFY throughout the San Vicente Management Area.

Groundwater also serves as the primary source of supply within the Barona Valley. Over the past several years, private well owners in the vicinity of the Barona Indian Reservation have experienced declining water levels. Both on- and off-Reservation development of the area and the recent drought conditions have likely contributed to these water level declines. As a result, water is currently being trucked on-site, and the Reservation is negotiating with the City of San Diego for water supply from San Vicente Reservoir.

Routine water quality monitoring of private groundwater wells within the San Vicente Management Area is not required, but DEH requires PWSs to monitor public water supply wells for quality and notify customers if testing indicates non-compliance with drinking water standards.

No community water systems exist within the San Vicente Management Area, but a TNC water system exists at Featherstone Canyon Camp along Wildcat Canyon Road in Lakeside. Additionally, the Robert L. Hunt Water Company (a State Small Water System) provides water service in a small service zone northwest of the Barona Indian Reservation.

No published CDWR or other reliable studies of groundwater within the San Vicente Management Area are available. CEQA documents for the Barona Indian Reservation development were published, but the studies did not adequately address groundwater

storage or recharge within the Barona Valley portion of the San Vicente Management Area. While no reliable published studies are known to exist that describe groundwaters of the San Vicente Management Area, the nature of the aquifers within the management area indicates that groundwater quality is likely to be highly variable. Water quality within individual wells would be influenced by such factors as well location, well screen depth, and recharge sources.

4.2.3 Nitrate Issues

The RMWD service area extends throughout the northern portion of the San Vicente Management Area, but RMWD provides sewer service only within the San Diego Country Estates portion of the management area. RMWD operates a recycled water treatment plant at San Diego Country Estates, where treated recycled water is applied to adjacent lands. Within the City of Poway, wastewater is exported to the San Diego Metropolitan Sewerage System.

Wastewater service within the vast majority of the San Vicente Management Area is provided by on-site septic tanks.

In addition to nitrate loads from septic tanks, irrigated agriculture exists throughout the rural lands in the northern portion of the San Vicente Management Area. Groundwater data are not available to characterize nitrate concentrations in these areas, but land use characteristics indicate the potential for nitrate-related groundwater quality problems as a result of septic tanks and irrigation/fertilization.

4.2.4 TDS

No collective water quality monitoring assessments of San Vicente Management Area groundwater have been performed, and no public water supply monitoring data are developed within the management area.

Basin Plan groundwater TDS objectives for the San Vicente Management Area are 600 mg/L. While groundwater quality is likely to be highly variable within the management area, historic groundwater quality data presented by CDWR (1967) indicates that the

Basin Plan groundwater quality TDS objectives were originally representative of groundwater TDS concentrations within the San Vicente Management Area. Basin Plan groundwater quality TDS objectives may no longer be representative of groundwater quality within the San Vicente Management Area. Imported water use, increased development, and other salt loads within the northern portion of the San Vicente Management Area indicate the potential for increased TDS groundwater concentrations in recent decades. Data are not available to confirm this supposition, however, as (1) no public groundwater supply development occurs within the San Vicente Management Area, and (2) no recent groundwater studies or water quality data have been published for management area.

4.2.5 Assessment of Quality and Quantity of Groundwater

Little current information exists to assess the quantity of groundwater within the San Vicente Management Area. While specific yields of fractured rock aquifers (even when overlain by shallow alluvium/residuum) tend to be low, the large areal extent of the aquifers within the San Vicente Management Area may result in a significant quantity of groundwater being stored within the management area. For any individual well, however, groundwater production would be limited by local conditions such as individual well locations, storage capacities of fractures contiguous to the well, and sources and rates of groundwater recharge.

As a result of these characteristics, fractured rock aquifers are likely to be sufficient to provide water supply to sparsely developed rural areas. Such aquifers, however, are unlikely to be sufficient to supply denser developments or large-scale commercial or agricultural projects. Groundwater production difficulties within the Barona Valley upon completion of the Barona Valley hotel/golf course complex would appear to confirm this general conclusion.

As noted above, imported water use, increased development, and other salt and nitrate loads within the northern portion of the San Vicente Management Area indicate the potential for increased groundwater concentrations of TDS and nitrate.

4.3 San Diego Management Area

4.3.1 Description of Groundwater Resources

All principal alluvial aquifers within the SDRW are within the San Diego Management Area (Figure 1-5). Alluvial aquifers are an important water resources component within the SDRW due to:

- The large amount of groundwater stored in the aquifers
- Well yields and hydraulic conductivities of the aquifers are typically high
- Groundwater recharge rates are significant, as streamflow infiltration represents the primary source of recharge to the aquifers
- Groundwater from the alluvial aquifers may form a significant component of non-storm base flow in the San Diego River and key tributaries

Alluvial aquifers represent the prime source of groundwater within the San Diego Management Area. Table 4-1 summarizes key groundwater aquifers within the San Diego Management Area.

Table 4-1
Principal Groundwater Aquifers within San Diego Management Area

Principal Groundwater Basin/Aquifer	Aquifer Medium	Approximate Storage Capacity (AF)
Santee/El Monte Basin	Unconfined alluvium	70,000[1]
El Cajon Basin	Unconfined alluvium/residuum	32,500[2]
Mission Valley	Unconfined alluvium	40,000[3]
San Diego Formation	Confined consolidated sediments	Unknown[4]

Notes: [1] Storage capacity estimate from CSDWA (1997). CDWR (1975) estimates the storage capacity of the Santee/El Monte basin at 97,000 AF.
[2] Storage capacity estimate from CDWR (1986).
[3] Storage capacity estimate from CSDWA (1997). CDWR (1975) estimates Mission Valley groundwater storage at 42,000 AF.
[4] A small portion of the San Diego Formation is believed to underlie the western end of Mission Valley, but no storage estimates have been reported.

Santee/El Monte Basin. Of the alluvial aquifers within the San Diego Management Area, the Santee/El Monte basin is the most important from both groundwater quality and groundwater production standpoints. As shown in Figure 1-5, the Santee/El Monte basin covers approximately 7 square miles, and extends throughout Moreno Valley, Lakeside, and Santee.

With approximately 70,000 AF of capacity, the Santee/El Monte aquifer is the largest within the SDRW. CSDWA (1997) reports that alluvium thickness averages approximately 100 feet, but can extend to 200 feet in the Moreno Valley portion of the basin. Well yields in the basin are variable, but can range from 1,000 to 2,000 gpm in the El Monte (eastern) portion of the basin. Specific yields have been reported to vary from 5 to 22 percent (CDWR 2003). Streamflow infiltration from the San Diego River and San Vicente Creek represent the primary source of recharge to the Santee/El Monte basin.

El Cajon Basin. As shown in Figure 1-5, the El Cajon basin extends over approximately 11 square miles and throughout much of the City of El Cajon. The El Cajon basin consists of shallow alluvium underlain by crystalline rock or siltstone. Wells within the basin typically develop supply from both the upper alluvium and the underlying fractured rock (CDWR 1986).

Alluvium thickness varies within the El Cajon basin, but CDWR (2003) reports a typical alluvial thickness of 50 feet. Because of the large areal extent of the basin, the total groundwater storage capacity of the basin is reported at 32,500 AF. An aquifer specific yield of 5 percent is reported, with typical well yields of 250 gpm or less (CDWR 2003). Forester Creek is the principal surface stream within the basin, and streamflow infiltration represents the primary source of recharge.

Mission Valley Basin. The Mission Valley basin is a highly porous alluvial aquifer that extends the length of Mission Valley. The long, narrow basin covers approximately 11 square miles along the San Diego River. The Mission Valley alluvial aquifer has a storage capacity of approximately 40,000 AF. Medium to coarse sand and gravel comprise much of the aquifer, and a 15 percent aquifer specific yield is reported (CDWR 2003). Well productions in excess of 1,000 gpm have occurred within the basin. Because of the porosity of the aquifer, recharge through streamflow infiltration is rapid, and significant interchange between surface flows and groundwater flow occurs.

4.3.2 Groundwater Use and Monitoring

Municipal water supplies are developed by several public agencies within the Santee/El Monte basin. Community water systems (PWSs with more than 200 service

connections) regulated by DHS that derive supply by pumping groundwater from within the San Diego Management Area include:

- **Helix Water District.** HWD maintains and operates a well within the El Monte basin that provides approximately 250 AFY of groundwater. The groundwater supply is used by HWD to supplement local surface water and imported supplies.
- **Lakeside Water District.** Lakeside Water District develops approximately 1,000 AFY of groundwater supply from wells within the El Monte basin. Withdrawn groundwater is treated for iron and manganese removal and is disinfected prior to blending with imported waters for distribution to Lakeside Water District customers.
- **Riverview Water District.** Riverview Water District develops approximately 350 AF per year of groundwater supply from wells in the El Monte basin. Withdrawn groundwater is disinfected and blended with imported water to supply Riverview Water District customers.

The City of San Diego does not currently develop any groundwater supply from the Santee/El Monte basin, but the City maintains wells within the watershed that are designated for emergency use. PDMWD does not currently develop any groundwater supply from wells in the SDRW, but has studied the potential for groundwater storage and use within the Santee/El Monte basin.

In addition to the above PWSs, several TNC water systems exist within the San Diego Management Area that are regulated by DEH. TNC water systems within the San Diego Management Area that derive supply from groundwater include:

- Louis Stelzer Park (Wildcat Canyon, Lakeside)
- El Monte County Park (El Monte, Lakeside)
- Errecas Associates (Slaughterhouse Canyon, Lakeside)

Several bottled water companies also derive supply from groundwaters of the San Diego Management Area. Bottled water companies utilizing groundwater within the San Diego Management Area are regulated by the State of California Food and Drug Branch of DHS, and include:

- PureFlo Water Company (Santee)
- Sierra Springs (San Diego)
- Sparkletts Water Company (Lakeside)

Additionally, a municipal well owned by Lake Cuyamaca Park and Recreation and operated by the City of San Diego exists within the San Diego Management Area.

In addition to groundwater pumping by municipal agencies, TNC water systems, and bottled water companies, a significant number of private wells exist within the Santee/El Monte basin. NBS/Lowry (1995) performed a comprehensive survey of wells and water use within the Santee/El Monte basin, and estimated groundwater pumping by private users within the Santee/El Monte basin at:

- Approximately 400 AFY within the western portion of the Santee/El Monte basin (Santee sub-basin)
- Approximately 200 AFY within the portion of the Moreno Valley portion of the Santee/El Monte basin (Moreno sub-basin)
- approximately 2,400 AFY within the eastern portion of the Santee/El Monte basin (El Monte sub-basin)

Each of the DHS-regulated PWSs that develop groundwater supplies from Santee/El Monte groundwater basin conducts a considerable amount of monitoring on the water supply conveyed within their respective water distribution systems. Groundwater, however, comprises only a portion of the overall water supply developed by DHS-regulated PWSs. As a result, monitoring of individual groundwater supply wells for the three DHS-regulated agencies is considerably less frequent than water supply monitoring within the distribution system.

The degree of groundwater well monitoring performed by HWD, Lakeside Water District, and Riverview Water District is regulated as part of the water supply permits issued by DHS to the respective water agencies. While DHS requires quarterly bacteriological monitoring, monitoring for most water quality parameters is required only once every three years.

DEH regulates TNC water systems within the San Diego Management Area, and requires the TNC water systems to monitor public water supply wells for quality and notify customers if testing indicates non-compliance with drinking water standards.

No public water supplies are being developed by municipal agencies within the Mission Valley basin and El Cajon basin, and current water quality monitoring data for the basins are not available.

Groundwater pumping by private well owners within the Mission Valley basin is estimated at 500 AFY, primarily for golf course irrigation (CSDWA 1997) While no public water supply is currently being developed within the Mission Valley basin, the SDWD is exploring the potential for water supply development through groundwater demineralization (City of San Diego 2004[2]).

Mission Valley – San Diego River Restoration Project. The Bureau of Reclamation, City of San Diego, and San Diego River Park Foundation are exploring opportunities for groundwater monitoring locations in the Mission Valley area as part of the San Diego River Restoration Project. The Restoration Project is focusing on opportunities to restore the natural functions of the River, including the interaction of surface and groundwater. Demonstrations projects for low cost "bio-friendly" BMPs and habitat enhancement will also be explore to improve the condition of the River.

4.3.3 Nitrate Issues

Santee/El Monte Basin. Lakeside Sanitation District and PDMWD provide sewer service throughout much of the Santee/El Monte basin. Nevertheless, a number of areas in the eastern portion of the basin continue to receive wastewater service through on-site septic tanks. Nitrate loads within the Santee/El Monte basin are also contributed by irrigated agriculture and landscaping.

Nitrate concentrations within the Santee/El Monte basin are highly variable, and depend on well location, local hydrologic conditions, and local nitrate sources. No region-wide nitrate issues have been reported within the basin, but nitrate concentrations of 15 mg/L (as N) have been reported in the Riverview Water District well. (The DHS drinking water standard for nitrate as N is 10 mg/L.)

El Cajon Basin. Sewer service exists throughout almost all areas of the El Cajon basin, but neighborhoods exist that are still served by septic tanks. Groundwater nitrate

concentrations within the El Cajon basin are high, but are attributed to nitrate loads from irrigation and lengthy hydraulic detention time. CDWR (2003) reports nitrate concentrations in excess of 20 mg/L (as N) in some locations within the basin.

Mission Valley Basin. The Mission Valley basin is located within the City of San Diego, which provides sewer service. As a result, virtually no septic tank systems exist in the basin. Because of high aquifer porosity and lack of significant nitrate load sources, no nitrate water quality problems have been reported in Mission Valley.

4.3.4 Dissolved Solids

Santee/El Monte Basin. Groundwater TDS concentrations within the Santee/El Monte basin vary significantly. TDS concentrations typically increase with distance downstream within the Santee/El Monte basin. Groundwater TDS concentrations of 300 mg/L or less have been reported in wells in the eastern portion of the basin, while TDS concentrations in the western portion of the basin can exceed 2000 mg/L (CDWR 2003). TDS concentrations in water supplies developed by Lakeside Water District and Riverview Water District typically range from 500 mg/L to 900 mg/L (CSDWA 1997; CDWR 2003).

El Cajon Basin. Groundwater TDS concentrations within the El Cajon basin are poor as a result of basin geology, salt loads, and lengthy hydraulic detention time. CDWR (1986) reports variable water quality within the El Cajon basin, with TDS ranging from less than 1,000 mg/L to 4,000 mg/L. CDWR (1986) reports a mean TDS concentrations within the El Cajon basin in excess of 1500 mg/L.

Mission Valley Basin. Groundwater TDS concentrations within Mission Valley basin are also highly variable. CSDWA (1997) reports TDS concentrations in the Mission Valley basin that range from 1,000 mg/L in the upstream portion of the basin to 3,000 mg/L in the downstream portion of the basin. Because of the significant interchange between ground and surface waters, however, groundwater TDS concentrations in Mission Valley can improve during significant hydrologic events.

4.3.5 Assessment of Quality and Quantity of Groundwater

Santee/El Monte Basin. Significant quantities of groundwater exist within the Santee/El Monte basin. Current groundwater pumping in the basin by municipal water supply agencies is approximately 1,600 AFY, while pumping by private well owners is estimated at approximately 3,000 AFY. Since CSDWA (1997) estimates the sustainable yield of the Santee/El Monte basin at 5,600 AFY, the existing groundwater production capacity of the aquifer is currently utilized. Additional groundwater development within the basin may require artificial recharge.

Groundwater quality in the eastern portion of the Santee/El Monte basin is excellent, with low TDS concentrations, and low concentrations of iron and manganese. While elevated nitrate concentrations resulting from localized nitrate sources have been reported in some private wells, no regional nitrate problems appear to occur in the eastern portion of the Santee/El Monte basin.

Groundwater quality in the central portion of the Santee/El Monte basin is variable. Groundwater TDS concentrations tend to range from 500 to 900 mg/L, and groundwater supplies from this portion of the basin may be used for potable purposes without the need for demineralization treatment. However, localized water quality problems do occur. Iron and manganese in the Lakeside Water District wells require the District to provide treatment to remove iron and manganese prior to distribution to potable water customers. Riverview Water District reports high concentrations of nitrate and detectable concentrations of MTBE in groundwater supplies.

Groundwater quality in the western portion of the Santee/El Monte basin contains high concentrations of TDS, and would require groundwater demineralization to make the supplies usable for irrigation or municipal use.

El Cajon Basin. While significant groundwater supplies exist within the El Cajon basin, groundwater use within the basin is limited by low well yields, high TDS concentrations, and high nitrate concentrations.

Mission Valley. Significant groundwater supplies exist within the Mission Valley basin, but groundwater use within the basin is limited by groundwater TDS concentrations.

The SDRWQCB maintains records of all known sources of underground tank contamination in a region-wide data base, and tracks the process of cleaning up the contamination. The SDRWQCB addresses all groundwater contamination events, but places a priority on investigating and remediating groundwater contamination events that may impact beneficial uses due to noncompliance with drinking water Maximum Contaminant Levels (MCLs) established by USEPA or DHS.

Underground fuel tanks are a common source of groundwater contamination that may result in noncompliance with state and federal MCLs for benzenes, MTBE, and other volatile organic compounds. MTBE, in particular, is a key contaminant due to (1) its low State of California MCL of 5 μg/L and (2) its ability to be rapidly dispersed by diffusion and advection throughout an aquifer.

SDRWQCB publishes a quarterly list of MTBE contamination sites, and maintains a data base of MTBE groundwater sampling. The current (first quarter 2004) SDRWQCB MTBE data base lists more than a dozen MTBE spill sites within the SDRW. Among the largest and most significant sites is the Mission Valley Terminal, located at the intersection of Interstate 15 and Friars Road. Fuel leaks from the Mission Valley Terminal site have resulted in contamination of groundwaters near Qualcomm Stadium with benzene and MTBE.

The City of San Diego is exploring the potential for developing potable water supply from the Mission Valley alluvial aquifer. The City's proposed plan incorporates groundwater demineralization as a result of high TDS concentrations in the aquifer. The City envisions project implementation by year 2010. (City of San Diego 2004[2]). The Mission Valley Terminal fuel leak may impact plans of the City of San Diego to implement this groundwater demineralization project, and the SDRWQCB is currently assessing alternative strategies and time schedules to force the operator of the Mission Valley Terminal to clean up the spill.