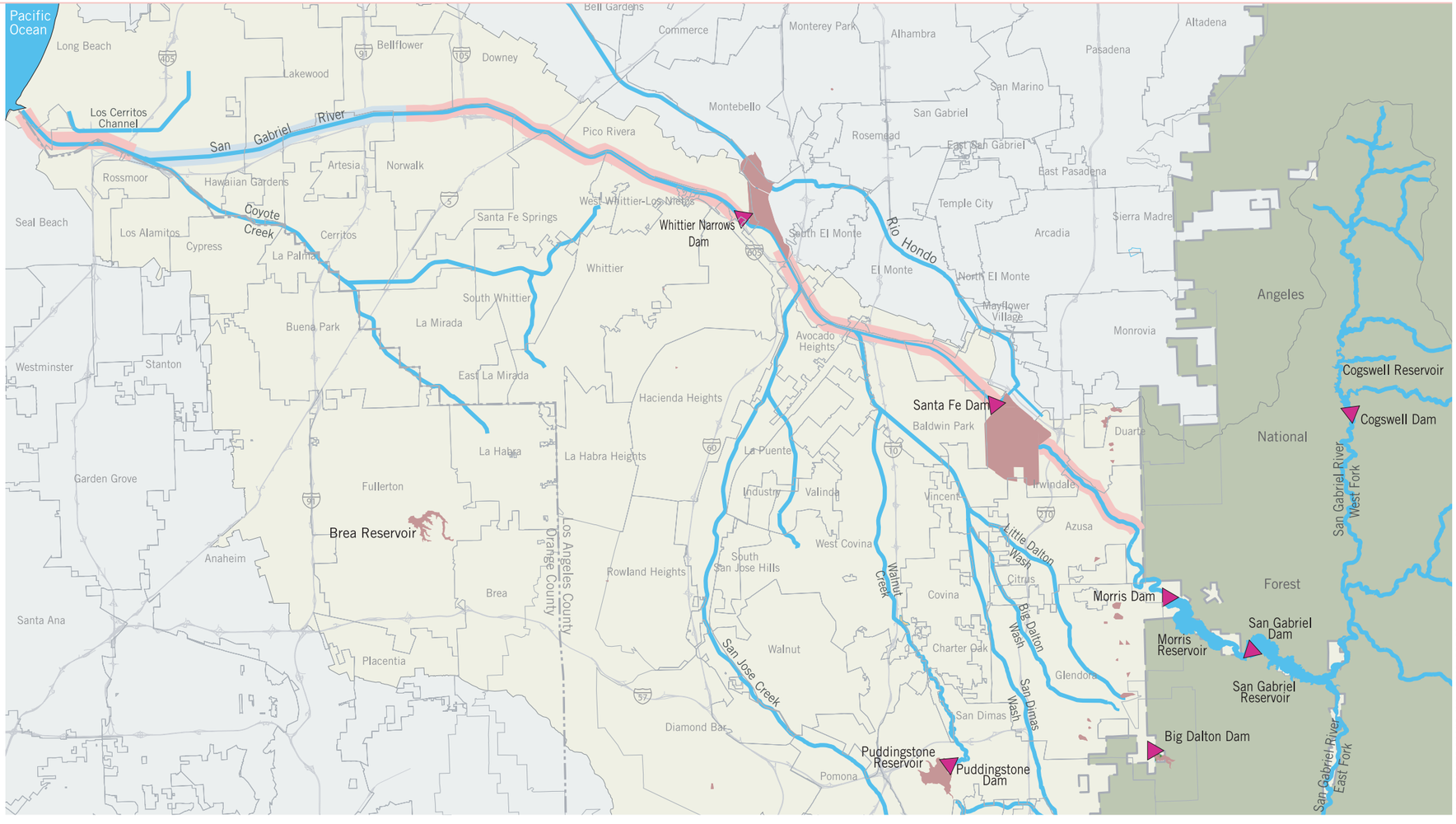


Map 2-7. Flood control structures.

Figure 2-59. The counterweights on the spillway at Whittier Narrows Dam are significant part of this intricate structure.

WHITTIER NARROWS DAM. Owned by the U.S. Army Corps of Engineers, Whittier Narrows Dam captures water flowing in the San Gabriel River and the Rio Hondo. Construction began on the earth-fill dam in 1949 and was completed in 1957 at a cost of $32.2 million.

Flood Channel

In most of the urban areas of the San Gabriel Valley, the river flows in a soft-bottomed channel between raised levees. The soft-bottom channel promotes infiltration of water released from the dams during large storms or for spreading. Beginning seven miles below the Whittier Narrows Dam, the soft bottom of the river is replaced by a concrete channel for about 10 miles (Reach 6). Just downstream from the confluence with Coyote Creek, the river returns to a soft-bottom, and flows another 3.5 miles through a natural estuary to the Pacific Ocean.

LADPW is responsible for operation and maintenance of most of the flood channel. The two exceptions, maintained by the COE, are:

- From the mouth of the San Gabriel Canyon to Santa Fe Dam; and the
- Whittier Narrows Flood Control Basin.

Most of the flood control channel is designed to meet capacity requirements of a 100-year flood. However, the channel capacity varies along different segments of the river. The map presents an analysis of channel capacity for various segments of the river, starting at the Santa Fe Dam, down to the mouth in Seal Beach (see Map 2-8). Specifically, it shows the amount of excess capacity for different reaches in cubic feet per second.

The area of greatest channel capacity (*deep purple segment*) runs from the Santa Fe Dam to just below the Whittier Narrows Dam. This segment includes all of Reach 4, and the beginning of Reach 5. Excess capacity on this long segment varies from 5,000 to 30,000 cubic feet per second.

Overall channel capacity below Whittier Narrows Dam is less than that above Whittier Narrows. However, with the minor exception of two short segments, the southern portion of the river still exceeds capacity requirements of a 100-year flood. The two segments that do not meet this requirement (*orange segments*) are in Reach 5 and Reach 7:

- Pico Rivera (Reach 5)—from Whittier Boulevard down to Washington Boulevard, alongside the San Gabriel Coastal Basin Spreading Grounds.
- Long Beach (Reach 7)—below the confluence with Coyote Creek, from the 405 Freeway south to 7th Street/22 Freeway.

The storm drain system captures and conveys stormwater through a network of gutters, drainage structures, and underground pipes. These systems move water as quickly as possible by transporting it downstream to outfalls, where it reaches the main channel of the river. As the water is conveyed downstream, additional tributary conveyance systems feed into it, requiring that capacity enlarges as the network approaches its outfall. Although a portion of this storm water will be directed into spreading grounds for percolation into underlying groundwater basins, during large storm events water in excess of the system's capacity will go out to sea.

COURTESY BONTERRA CONSULTING

Figure 2-60. The stretch of the river below Santa Fe Dam is encased in an earthen levee.

Figure 2-61. The concrete channel begins seven miles below Whittier Narrows Dam.

Figure 2-62. Dozens of city and county stormdrains flow to the river, such as this one in Azusa.

Modifications to traditional stormwater systems have included detention and retention basins designed to detain a portion of the water for controlled release after the peak runoff has occurred. Since the storm drain system is constructed of concrete and other impervious materials, water cannot infiltrate into the soil unless it is diverted to spreading grounds or other soft-bottom portions of the river system.

The "storm drain" map (see Map 2-9) shows existing storm drains and channels in Los Angeles County, maintained by LADPW. The storm drain system generally mimics the historic locations of rivers and tributaries. Topography dictates flow patterns, whether they are natural rivers or human-

Source: County of Los Angeles Department of Public Works, Montgomery Watson Harza, and Rivers and Mountains Conservancy

Map 2-8. Existing channel capacity.

built channels. The storm drain system operates within the boundaries of the watershed. Since the natural boundary of the San Gabriel River is only a short distance west of the river, storm drains leading to the river from this direction are much shorter than those coming from the east. Storm drains to the west of the San Gabriel River Watershed feed instead into the Rio Hondo.

The map of the County storm drain systems indicates gaps, where presumably local City storm drains connect into the County system. There are no storm drains or channels in the Puente-Chino Hills or in the San Gabriel Mountains.

Water Supply

Drinking water for residents of Southern California—including Ventura, Los Angeles, San Bernardino, Riverside, Orange and San Diego Counties—comes from a variety of sources. This region is home to about 18 million people. Because of the overuse of local supplies, communities need imported water to meet current demands, which can cost as much as 10 times that of local water. Given Southern California's growing population, identifying future supplies is a key issue for the future of the region.

Water supplies for the San Gabriel River region come from three main sources: local surface and groundwater supplies, reclaimed water and distant or "imported" sources. The local water suppy begins as rainfall that percolates naturally into the underlying groundwater basins or results in surface runoff. Reclaimed water is treated wastewater from local Water Reclamation Plants (WRP). Imported water is water transported to the region from distant sources, hundreds of miles away. The San Gabriel Valley water supply, based on these three sources, is derived through an intertwined network, which involves the transport, percolation, storage and conveyance of imported sources, surface flows, and groundwater. Groundwater basins are the primary means for water storage in the region and are recharged through natural soil percolation, as well as through engineered spreading grounds. Spreading grounds allow water to percolate into groundwater basins for later pumping.

Spreading grounds allow water to percolate into groundwater basins for later pumping.

WATER SUPPLY INFRASTRUCTURE

This section provides an overview of the water supply infrastructure for the San Gabriel Valley and Coastal Plain cities below Whittier Narrows. The water supply infrastructure is composed of five principal components: surface water, groundwater (and the groundwater basins), spreading grounds, reclaimed water and imported water.

COURTESY NORTH EAST TREES

Figure 2-63. Reclaimed water from the San Jose Creek Reclamation Plant is a source of locally derived water supply.

Surface Water

The San Gabriel River and its major tributaries (the West Fork, North Fork, East Fork, Walnut Creek, San Jose Creek and Coyote Creek) is the predominant surface water feature within the San Gabriel River Watershed. Surface runoff from the San Gabriel River and its tributaries provides a portion of the recharge of local groundwater basins through both natural infiltration and via spreading grounds. The major dam and reservoir facilities, previously described, were developed to impound water not only for flood control purposes but also water supply purposes in the San Gabriel River. Between 90 and 95 percent of precipitation above Whittier Narrows Dam is retained in the watershed for local water supply. The precipitation is conveyed via the river and storm drain system to area spreading grounds to be stored for future use by various water agencies. Natural percolation occurs in all areas except roads, buildings, parking lots and other impermeable surfaces. Precipitation varies along the route of the river: the average annual rainfall is 35 inches in the San Gabriel Mountains; the San Gabriel Valley averages 17 inches; and the coast averages 12 inches.

Groundwater

Groundwater basins, or aquifers, are natural underground formations filled with sediment, including sand and gravel. They serve as underground water reservoirs; wells drilled into the basins pump water to the surface for human use. Three groundwater basins lie underneath the river: the Main San Gabriel, the Central Basin and the West Coast Basin (see Map 2-10). These basins are part of the geologic occurrence known as the Los Angeles Basin, which is over three miles deep in some locations.

In addition to daily water supply, groundwater aquifers hold emergency reserves of water for periods of drought and natural disasters that might disrupt normal water deliveries. Groundwater basins store local rainfall for use, but demand would far exceed capacity if water supplies were derived entirely from rainfall. Groundwater supplies must be supplemented with reclaimed water from Water Reclamation Plants, as well as costly imported water.

The Main San Gabriel Basin contains contaminated plumes that are also shown on the groundwater map. Contaminated water is being treated to remove the contaminants and to prevent the polluted water from migrating south into the Central Basin, which is separated by Whittier Narrows.

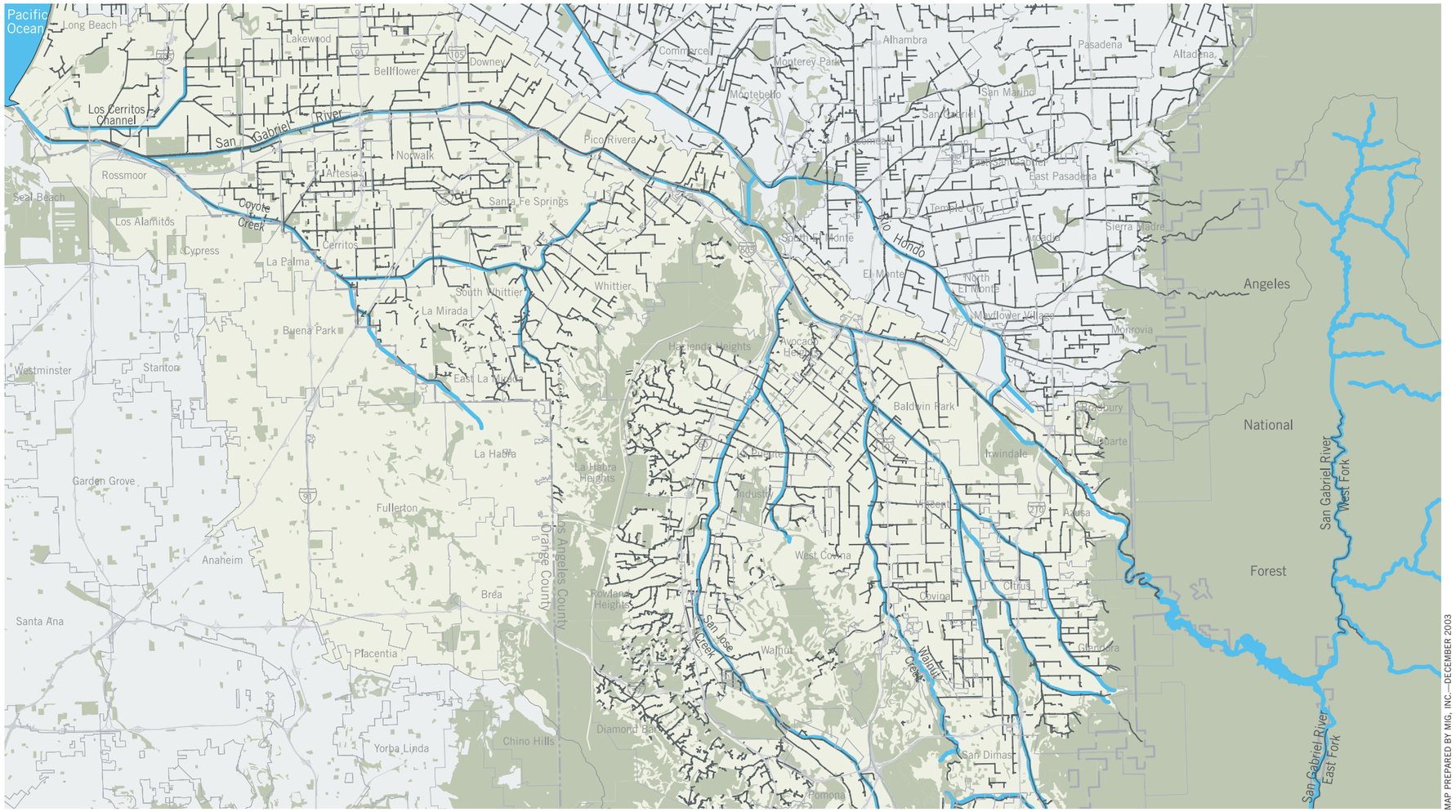
Main San Gabriel Basin

This basin underlies the San Gabriel Valley. It is bounded on the north side by the base of the San Gabriel Mountains, on its east side by the San Jose Hills, on the south by Whittier Narrows and Puente Hills, and on the west by a series of hills and the Raymond Fault. This groundwater aquifer has a different hydrologic basin or "watershed" than surface watersheds. In fact, it sits underneath two surface watersheds, the upper portion of the San Gabriel River and the eastern portion of the Los Angeles River Watersheds. The surface area of the groundwater basin is about 167 square miles. This basin provides approximately 80 percent of local groundwater supplies. The fresh water storage capacity of the basin is about 8.6 million acre-feet. An acre-foot is one foot of water covering one acre of land; enough water to supply two typical households for one year.

Within the vicinity of the San Gabriel River, there are five contaminated plumes that are being cleaned-up by a consortium of agencies under the coordination of the San Gabriel Basin Water Quality Authority (WQA). The five plumes are called "Operable Units (OU)" and include:

BALDWIN PARK OU. This is the largest OU. Perchlorate is a significant problem here because traditional treatment methods are ineffective in removing it from groundwater. Nitrosodimethylamine (NDMA) is also a problem.

EL MONTE OU. Characterized by shallow groundwater contamination in the upper 100 feet of the aquifer, and limited to Volatile Organic Compounds (VOCs), requiring a simple clean-up approach. Some water supply wells, in El Monte for example, have had to close because of contamination, decreasing supplies of locally available water. Deep groundwater contamination has been found in the northwest and eastern areas of this OU.



Map 2-9. Existing storm drains.

PUENTE VALLEY OU. This OU includes portions of the City of Industry and the City of La Puente and overlies both the Puente Groundwater Basin and the Main San Gabriel Groundwater Basin. The EPA sent notices to 50 Potential Responsible Parties (PRPs) regarding clean up in the area. Of those, 34 companies have formed the Puente Valley Steering Committee (PVSC) to fund and implement work required by the EPA in the Remedial Investigation/Feasibility Study (RI/FS) phase of the Superfund cleanup. The PRPs are now in the final stages of the RI/FS.

SOUTH EL MONTE OU. This plume continues to migrate and threatens to enter the Central Basin. The mix of contaminates is more serious than the El Monte OU, making treatment more difficult and costly. The loss of well productivity is of great concern to entities that rely on this local source of water.

WHITTIER NARROWS OU. This OU is contaminated with VOCs, with the presence of perchlorates and low concentrations of dioxins. Action has taken place to prevent migration of these contaminants into the Central Basin. A containment barrier has been established by the EPA, and includes three to four extraction sites that will remove and treat polluted groundwater.

Central and West Coast Basins

The Central Basin is located below Whittier Narrows and goes down to the coast at Long Beach. The West Coast Basin lies at the mouth of the San Gabriel River and extends to the northwest away from the river. The Water Replenishment District (WRD) is responsible for recharging water to the basins. An impermeable clay layer called an aquaclude sits underneath the river from Downey down to the confluence of Coyote Creek in Long Beach.

These two basins rely on several sources of water delivered via spreading grounds and injection wells:

- Imported water purchased from the Metropolitan Water District of Southern California
- Reclaimed water from local Water Reclamation Plants
- Local runoff and rainfall
- "Make-up" water from the Main San Gabriel Basin
- Subsurface flows from adjacent basins

Some significant threats to the quality of the groundwater supply in these two basins include VOC contamination from migrating plumes originating in the Main San Gabriel Basin through the Whittier Narrows, isolated areas of existing local contamination and saltwater intrusion from the ocean into the groundwater aquifer.

Spreading Grounds

Spreading grounds are a very important part of the local water supply infrastructure. They are essentially large ponds that temporarily hold water, which allows sufficient time for the water to percolate through the bottoms and sides of the ponds and replenish the groundwater basin. With the exception of Fish Canyon Spreading Grounds in Duarte, the spreading grounds along the San Gabriel River are owed by the Los Angeles County Flood Control District and operated by LADPW.

The basins are fed by carefully controlled allocated water from the San Gabriel River. Water from the river is derived from different sources, depending on the time of year. During the rainy season, water is derived from storm runoff, both from the mountains and the urban areas that drain to the river. This is mixed with water from the Water Reclamation Plants. Between storms and during the dry season, water for groundwater recharge is provided by releasing water held at upstream reservoirs, adding water from the plants, and by imported water bought from the Metropolitan Water District of Southern California (with some nuisance runoff from urban areas). The amount of water being recharged to the basins is carefully controlled. During the last 10 years, an average of 63,000 acre-feet of imported water and 47,000 acre-feet of reclaimed water has been recharged annually. The quantity of reclaimed water used for recharge each year is governed by water reclamation requirements and the imported water by groundwater basin recharge needs.

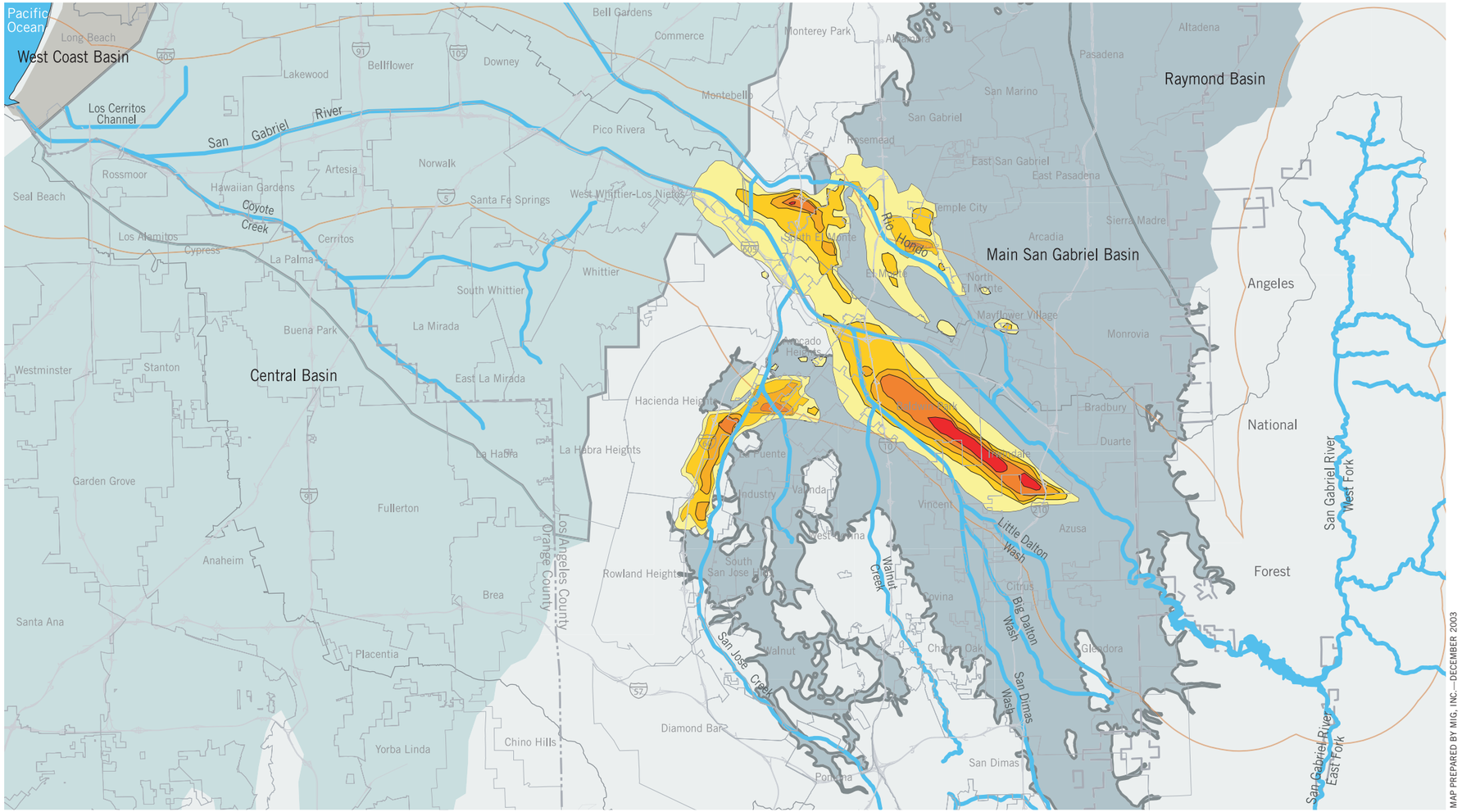
Figure 2-64. The San Gabriel Canyon Spreading Grounds are former gravel mining pits.

Figure 2-65. The Rio Hondo brings water from the San Gabriel River to productive spreading grounds in Pico Rivera.

According to the Sanitation Districts of Los Angeles County: "The amount of water being recharged within the Montebello Forebay, which includes the Rio Hondo and San Gabriel Coastal Basin Spreading Grounds as well as the unlined reaches of the San Gabriel River, is established in Order 91-100. This order, issued by the Los Angeles Regional Water Quality Control Board, establishes the water reclamation requirements for the recharge project. According to the permit, the average quantity of reclaimed water spread, based on a running three-year average, shall not exceed 50,000 acre-feet per year. In addition, the maximum quantity of reclaimed water spread in any one year shall not exceed 60,000 acre-feet or 50 percent of the total inflow into the Montebello Forebay for that year, whichever is less. And, the maximum quantity of reclaimed water spread in any three-year period shall not exceed 150,000 acre-feet and 35 percent of the total inflow from all sources into the Montebello Forebay during that period."

Spreading basins are significant unbuilt areas, often surrounded by residential communities. But the spreading ground basins are deep and the sides are quite steep. Because the water in these ponds directly recharges our groundwater supply, direct human contact is not permitted and they are generally closed to the public, with the exception of the newly opened public trails within the Rio Hondo and San Gabriel Coastal Basin Spreading Grounds.

As shown on the map, there are three spreading grounds in operation along the San Gabriel River and a fourth spreading ground along the Rio Hondo (see



Source: County of Los Angeles Department of Public Works and Rivers and Mountains Conservancy

Note: Plume data from San Gabriel Basin Water Quality Authority.

Groundwater Basins and Contaminated Plumes

County of Los Angeles Department of Public Works

San Gabriel River Corridor Master Plan

Map 2-10. Groundwater basins and contaminated plumes.

COURTESY BONTERRA CONSULTING

Figure 2-66. Rubber dams help the recharging process along soft-bottom stretches of the river.

Map 2-11). The soft-bottom San Gabriel River itself is also being used as a "spreading ground." A series of 13 rubber dams help hold back floodwaters along the river to allow water to percolate down after storms and dam releases.

The Rio Hondo is an integral part of the San Gabriel River water supply conveyance system. This is because the most productive groundwater recharge spreading grounds, the Rio Hondo Coastal Basin Spreading Grounds in Pico Rivera, are fed by the Rio Hondo. Although the Rio Hondo is a tributary of the Los Angeles River, it now also functions as a distributary of the San Gabriel River. In other words, water is conveyed to the Rio Hondo from the San Gabriel River for water supply purposes. This water, a combination of stormwater runoff, imported water and reclaimed water, travels through one of three channels, either the Buena Vista Channel by the Santa Fe Dam or the Lario Creek/Zone 1 Ditch or the Crossover Channel just above Whittier Dam.

SAN GABRIEL CANYON SPREADING GROUNDS. These spreading grounds lie on the west side of San Gabriel River, below the mouth of San Gabriel Canyon and north of the City of Azusa. These two basins are classified as "deep" basins due to their former use as gravel quarries. They recharge the uppermost areas of the Main San Gabriel Basin, cover 140 wetted acres and store up to 8,170 acre-feet of water. Sources of water include San Gabriel River controlled releases from Cogswell Dam, San Gabriel Dam and Morris Dam and Committee of Nine surplus flows and imported water.

SANTA FE SPREADING GROUNDS. These spreading grounds are located within Santa Fe Dam reservoir and spillway areas of the Santa Fe Dam, near the City of Irwindale, just below the 210 Freeway. There are 16 shallow basins in this area that replenish the Main San Gabriel Basin. They cover 168 wetted acres, storing up to 540 acre-feet of water. Sources of water include controlled flows from San Gabriel Canyon Reservoirs, uncontrolled flows from San Gabriel River below Morris Reservoirs and imported water.

SAN GABRIEL RIVER (SAN GABRIEL VALLEY). Within the soft-bottom stretch from the Santa Fe Dam to Whittier Narrows Dam, the San Gabriel River itself has in-river spreading capabilities. The storage occurs behind four rubber dams installed on drop structures. The area of percolation is 196 wetted acres. Sources of water include controlled flows from the San Gabriel and Morris Dams, and uncontrolled runoff from the San Gabriel Valley below Santa Fe Dam, as well as imported water.

SAN GABRIEL RIVER (MONTEBELLO FOREBAY). Within this soft-bottom stretch from the headworks below Whittier Narrows Dam down to Firestone Boulevard, the San Gabriel River has spreading capabilities. The storage occurs behind seven rubber dams installed on drop structures. The area of percolation is 308 wetted acres that can store 913 acre-feet of water. Sources of water include controlled releases from San Gabriel Canyon Dams, Santa Fe and Whittier Narrows Dams, and imported and reclaimed water.

SAN GABRIEL COASTAL BASIN SPREADING GROUNDS. These spreading grounds lie on the west side of San Gabriel River, south of Whittier Boulevard, to Washington Boulevard in Pico Rivera. There are three shallow basins in the productive Montebello Forebay, below Whittier Narrows, that replenish the Central Basin. There are 96 wetted acres of basins with storage capacity of 550 acre-feet of water. Sources of water include controlled releases from San Gabriel Canyon, Santa Fe and Whittier Narrows Dams and imported and reclaimed water.

RIO HONDO COASTAL BASIN SPREADING GROUNDS. These spreading grounds lie on the east side of the Rio Hondo, south of the Southern Pacific Railroad bridge (south of Whittier Boulevard) to Slauson Avenue and on the west side of side of Rio Hondo from 0.2 mile above Whittier Boulevard and south to Foster Bridge Boulevard. There are 20 shallow basins in the productive Montebello Forebay, below Whittier Narrows, that replenish the Central Basin. There are 430 wetted acres of basins with storage capacity of 3,694 acre-feet of water. Sources of water include controlled releases from San Gabriel Canyon, Santa Fe and Whittier Narrows Dams, uncontrolled runoff via the San Gabriel River, the Rio Hondo and their tributaries, and imported and reclaimed water.

Reclaimed Water

Treated wastewater at five Water Reclamation Plants (WRP) is discharged into the river or its tributaries. Water Reclamation Plants are managed by the County Sanitation Districts of Los Angeles County. These plants reclaim almost 80 million gallons per day from residential, industrial and commercial wastewater, making it available for reuse, which includes groundwater recharge, industrial and landscape uses. The Sanitation Districts own and operate five Water Reclamation Plants in the San Gabriel River Watershed.

Figure 2-67. The Rio Hondo Spreading Grounds are some of the most productive facilities in Los Angeles County.

POMONA WATER RECLAMATION PLANT. The Pomona Water Reclamation Plant is located at 295 Humane Way, Pomona. The plant occupies 14 acres northeast of the intersection of the Pomona (I-60) and Orange (I-57) Freeways. It discharges to the South Fork San Jose Creek, a tributary to the San Jose Creek, which is about 16 miles upstream from the San Gabriel River. It provides primary, secondary and tertiary treatment for 15

Source: County of Los Angeles Department of Public Works, Montgomery Watson Harza, and Rivers and Mountains Conservancy

Existing Water Supply Infrastructure

County of Los Angeles Department of Public Works

San Gabriel River Corridor Master Plan

Map 2-11. Existing water supply infrastructure.

million gallons of wastewater per day (15 MGD), enough for about 130,000 people. About 9 MGD of the purified water is reused at over 140 different reuse sites. These include irrigation of parks, schools, golf courses, landscaping and greenbelts, irrigation and dust control at the Spadra Landfill, industrial use by local paper manufacturers and use by commercial facilities. The remainder of the purified water is put back into the San Jose Creek channel, where it makes its way to the unlined portion of the San Gabriel River. Therefore, nearly 100 percent of the treated water is reused since the river water percolates into the groundwater.

SAN JOSE CREEK WATER RECLAMATION PLANT. The San Jose Water Reclamation Plant is located at 1965 Workman Mill Road, in unincorporated Los Angeles County, next to the City of Whittier. This is the largest Water Reclamation Plant operated by the Sanitation Districts, occupying 39 acres north of the I-60 Freeway on both sides of the I-605. The Water Reclamation Plant has three outfall locations. Treated effluent can be discharged to the San Jose Creek near the San Gabriel River confluence, to the San Gabriel River downstream of the San Jose Creek confluence, and to the San Gabriel River at Firestone Boulevard. The San Jose Creek Water Reclamation Plant provides primary, secondary and tertiary treatment for 100 MGD. The plant serves a largely residential population of about 1 million people. About 50 MGD of the purified water is reused at 25 different reuse sites. These include groundwater recharge and irrigation of parks, schools and greenbelts.

WHITTIER NARROWS WATER RECLAMATION PLANT. The Whittier Narrows Water Reclamation Plant is located at 301 N. Rosemead Boulevard in El Monte. This was the first reclamation plant built by the Sanitation Districts in 1962. It occupies 27 acres south of the Pomona (I-60) Freeway. This Water Reclamation Plant can discharge treated effluent at four different locations or outfalls located in the vicinity of the Whittier Narrows Dam, either separately or in combination. Treated effluent can be discharged to the San Gabriel River upgradient of the Whittier Narrows Dam, to the Zone 1 Ditch (Lario Creek) downstream of Whittier Wells Road, to the Rio Hondo, and to a site near the Zone 1 Ditch formerly used as a research basin for groundwater recharge studies but no longer in use. It provides primary, secondary and tertiary treatment for 15 MGD and serves a population of about 150,000 people. About 9 MGD of treated effluent is used for groundwater recharge, with a small amount being used for irrigation at a commercial nursery.

LOS COYOTES WATER RECLAMATION PLANT. The Los Coyotes Water Reclamation Plant is located at 16515 Piuma Avenue, Cerritos. The plant occupies 34 acres at the northwest junction of the I-605 and the I-91 Freeways. Twenty of the 34 acres is occupied by the Iron Wood Nine Golf Course, which is built on adjoining Sanitation Districts' property. The Water Reclamation Plant discharges exclusively to the San Gabriel River near the I-91 Freeway crossing. It provides primary, secondary and tertiary treatment for 37.5 MGD, serving about 370,000 people. Over 5 MGD of the purified water is reused at over 230 reuse sites. These include irrigation of schools, golf courses, parks, nurseries and greenbelts and industrial use at local companies for carpet dying and concrete mixing.

LONG BEACH WATER RECLAMATION PLANT. The Long Beach Water Reclamation Plant is located at 7400 E. Willow Street, Long Beach. The plant occupies 17 acres west of the I-605 Freeway. The Water Reclamation Plant discharges exclusively to Coyote Creek near the confluence with the San Gabriel River. It provides primary, secondary and tertiary treatment for 25 MGD for about 250,000 people. Over 5 MGD of the purified water is reused at over 48 reuse sites. These include irrigation of schools, golf courses, parks and greenbelts and for repressurization of oil-bearing strata.

Imported Water

Imported water, water derived from distant sources, is a major source of water supply for Southern California. The three primary sources of imported water are the Colorado River, the Owens Valley in eastern California, and the Sacramento-San Joaquin River Delta in Northern California. Imported water is costly because it is transported hundreds of miles from its origins, requiring extensive infrastructure and monitoring. Scarce rainfall in source regions can directly influence the amount of imported water supplies available to Southern California residents. The San Gabriel Valley requires less imported water than other regions of Los Angeles because it has so much local water supply. Water demands are currently met with available water supplies derived from both local and imported water stored in local reservoirs and aquifers. Growth in other regions such as Arizona and San Diego County is adding competitive pressure on the sources of water for Southern California. Consequently, local conservation measures are increasing in importance. Current practices include more stormwater capture, increased water conservation programs and increased reclaimed water resource utilization.

Three aqueducts supply water to Southern California:

COLORADO RIVER AQUEDUCT. Completed in 1941, this 242-mile aqueduct carries water from the Colorado River that is diverted from Lake Havasu in Arizona, traveling across the High Desert to Lake Matthews and the

Figure 2-68. The Long Beach Water Reclamation Plant discharges to Coyote Creek, just above the confluence with the San Gabriel River.

COURTESY CALIFORNIA DEPARTMENT OF WATER RESOURCES

Figure 2-69. The California Aqueduct brings State Water Project water to urban and agricultural users in Central and Southern California.

recently completed Diamond Valley Lake. Built and managed by the Metropolitan Water District of Southern California, the aqueduct serves Southern California residents in the Los Angeles and San Diego regions, delivering over one billion gallons of water a day (or 3.161 acre-feet) to Los Angeles.

LOS ANGELES AQUEDUCT. The Owens Valley lies between the Eastern Sierra Nevada and White Mountains in eastern California. Runoff from the mountains into this valley supplies City of Los Angeles residents with 480,000 acre-feet of water each year. In 1908, William Mulholland began to build this 233-mile aqueduct for the City of Los Angeles Department of Water and Power. To meet increasing demands for water, an extension from Mono Lake added 105-miles in 1940. A second aqueduct within the valley was completed in 1970. Restrictions on water use to protect the Sierra Nevada ecosystem will reduce future deliveries to 321,000 acre-feet a year during the next 20 years.

CALIFORNIA AQUEDUCT. The 444-mile California Aqueduct is part of the overall water storage and conveyance system called the State Water Project operated and maintained by the State of California Department of Water Resources. Starting southeast of San Francisco, the aqueduct conveys water from the Sacramento-San Joaquin River Delta to Southern California. The CALFED Bay-Delta Program is working to improve water supply reliability and ecosystem restoration, making future increases in water supplies for Southern California uncertain.

WATER SUPPLY INSTITUTIONAL ARRANGEMENTS

Various institutional arrangements and the water agencies defined by them are responsible for making water available to end-users.

Water Rights

Water rights determine who can draw upon water from the river and the groundwater bains, and how many acre-feet can be allocated to each user each year.

Surface water rights are administered by the State Water Resources Control Board (SWRCB). It has declared the San Gabriel River fully appropriated, which means the full water capacity of the river has been allocated and no new rights may be appropriated. Local rights to direct diversion of surface water in the San Gabriel River are held among local agencies, including primarily the San Gabriel River Water Committee, and the San Gabriel Valley Protective Association (see below).

Groundwater rights and plans to protect those rights in most basins in Southern California have been established through court adjudication and are administered by local court-appointed agencies, such as the Main San Gabriel Basin Watermaster (see below). Six local agencies and organizations are involved in administering water rights in the Master Plan area.

SAN GABRIEL RIVER WATER COMMITTEE. Formerly known as the "Committee of Nine," this nonprofit organization consists of five members that have rights to divert water from the San Gabriel River. Members, primarily in the upper San Gabriel Valley, are entitled to the first 135 cubic feet per second (cfs) of flows in the river, beginning up in San Gabriel Canyon. River water is first treated at the Canyon Filtration Plant in Azusa and the Covina Filtration Plant for potable uses. Excess water is sent to the San Gabriel Canyon Spreading Grounds to recharge the Main San Gabriel Basin, under an agreement with LADPW. The five members and their entitlement amounts in acre-feet per year are listed below.

- City of Azusa (3,252)
- Covina Irrigating Company (2,514)
- California-American Water Company (1,672)
- Monrovia Nursery Company (958)
- Azusa Agricultural Water Company (170)

MAIN SAN GABRIEL BASIN WATERMASTER. This agency is charged with administering adjudicated water rights and managing groundwater resources for the Main San Gabriel Basin. Parties that pumped 5,000 acre-feet or more from the Main San Gabriel Basin in fiscal year 2001-2002 are listed below. There are many other parties with smaller water rights.

- Azusa Valley Water Company
- California Domestic Water Company
- California-American Water Company
- City of Arcadia
- City of Glendora
- City of Monrovia
- City of Whittier
- Covina Irrigating Company
- Pellissier Irrevocable QTIP Trust, et. al.
- San Gabriel County Water District
- San Gabriel Valley Water Company
- Southern California Water Company
- Suburban Water Systems
- Valley County Water District

SAN GABRIEL VALLEY PROTECTIVE ASSOCIATION. The Association protects the water rights for 22 entities in the San Gabriel Valley. These members are entitled to the water from the San Gabriel River that is in excess of 135 cfs, beyond the allocation given for members of the San Gabriel River Water Committee. The water is used primarily for groundwater recharge. Members are listed below.

- California Domestic Water Company
- California-American Water Company
- Central Basin Municipal Water District
- City of Alhambra
- City of Arcadia
- City of Azusa
- City of Glendora
- City of Lakewood

- City of Monrovia
- City of Whittier
- Covina Irrigating Company
- La Habra Heights County Water District
- Montebello Land and Water Company
- Pico County Water District
- San Gabriel County Water District
- San Gabriel Valley Municipal Water District
- San Gabriel Valley Water Company
- Suburban Water Systems
- Upper San Gabriel Valley Municipal Water District
- Valencia Heights Water Company
- Water Replenishment District of Southern California

SAN GABRIEL RIVER WATERMASTER. The Watermaster is responsible for tracking the amount of surface water and groundwater that passes through the Whittier Narrows from the San Gabriel Basin to the Central Basin.

CENTRAL BASIN WATERMASTER. The Watermaster manages water rights for 146 parties, who are allocated a total of 217,367 acre-feet per year. Parties with an allocation of 3,000 acre-feet or more from the Central Basin are listed below.

- City of Huntington Park
- City of Lakewood
- City of Long Beach
- City of Lynwood
- City of Paramount
- City of Pico Rivera
- City of Santa Fe Springs
- City of South Gate
- City of Vernon
- City of Los Angeles Department of Water and Power
- Pico Water District
- Southern California Water Company
- Suburban Water Systems

WEST COAST BASIN WATERMASTER. The Watermaster tracks water rights for 68 parties who are allocated 64,468.25 acre-feet per year. Very little of the West Coast Basin lies in the vicinity of the San Gabriel River. However, this basin still affects water rights within the San Gabriel River corridor. Parties with an allocation of 1,000 acre-feet or more from the West Coast Basin are listed below.

- Atlantic Richfield Company
- California Water Service Company
- Chevron USA, Inc.
- City of Hawthorne
- City of Inglewood
- City of Lomita Water System
- City of Los Angeles
- City of Manhattan Beach
- City of Torrance
- Equilon Enterprises, LLLc
- Foothill Freeway
- Mobil Oil Corporation
- Shell Oil Company
- Southern California Water Company
- Tosco Corporation

Water Supply Agencies

A complex web of 15 water supply agencies in the San Gabriel River project area buys, sells, pumps, cleans-up and manages these precious water resources. Some agencies have direct water rights, while others are wholesalers or retailers of water. Others are responsible for either groundwater or surface water, or simply the clean-up of contaminated water. Several entities listed are also member agencies of the Metropolitan Water District of Southern California (MWD). This means that those member agencies buy imported water from MWD wholesale for local distribution.

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA (MWD). A consortium of 26 cities and water districts provides drinking water to nearly 18 million people in parts of Los Angeles, Orange, San Diego, Riverside, San Bernardino and Ventura counties. MWD currently delivers an average of 1.7 billion gallons of water per day to a 5,200-square-mile service area.

CENTRAL BASIN MUNICIPAL WATER DISTRICT. This public agency purchases imported water from the MWD and wholesales the water to cities, mutual water companies, investor-owned utilities, and private companies in southeast Los Angeles County. It also supplies water used by the Water Replenishment District for groundwater replenishment in spreading grounds, and provides the region with recycled water for municipal, commercial and industrial use.

CITY OF AZUSA, AZUSA LIGHT AND WATER. This municipally-owned utility in the San Gabriel Valley, serves over 125,000 residents and businesses that consume about 10 billion gallons of water per year.

CITY OF LONG BEACH WATER DEPARTMENT. The department serves a population of 461,000, the fifth largest city in the State of California. Its mission is to "deliver an uninterrupted supply of quality water to our customers; to effectively dispose of, or reclaim, sewage and runoff waters; and to operate in a manner that is economically efficient and environmentally responsible."

SAN GABRIEL RIVER WATER COMMITTEE (FORMERLY COMMITTEE OF NINE). This nonprofit organization has rights to surface flows from the San Gabriel River above Morris Dam, conveying that water to the San Gabriel Canyon Spreading Grounds in Azusa. Four local entities and cities have rights to the water including City of Azusa, California-American Water Company, Monrovia Nursery and Covina Irrigating Company.

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS. This agency controls the flow of local runoff, reclaimed and imported waters for recharge in the San Gabriel River and associated spreading grounds for both groundwater basins.

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY. This public planning and resource management agency provides imported water to more than 2 million Orange County residents, 70 percent of the County's population, through 27 cities and water districts and two private water companies. Half of Orange County's water supply comes from local sources; the other half is imported.

SAN GABRIEL BASIN WATER QUALITY AUTHORITY. The Authority coordinates the plans and activities of state and federal agencies and others involved in the cleanup of the Main San Gabriel Basin. It has been responsible for removing nearly 10 tons of contaminants. It is actively intercepting contaminated groundwater flowing toward the Whittier Narrows.

SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT. This Water District is responsible for maximizing water quality and quantity of the Main San Gabriel Basin for four cities in the valley: Alhambra, Azusa, Monterey Park and Sierra Madre. It contracts with the State of California Department of Water Resources for water supplies via the State Water Project. A pipe from the California Aqueduct in San Bernardino brings water to the San Gabriel Canyon Spreading Grounds in Azusa.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY. The Districts treat wastewater at five Water Reclamation Plants (WRP) near the San Gabriel River, adding reclaimed water to the local supply.

THREE VALLEYS MUNICIPAL WATER DISTRICT. This Water District provides water to 475,000 residents of the eastern Los Angeles County areas of the

San Gabriel, Walnut and Pomona Valleys. The District operates the Miramar Water and Hydroelectric facility in Claremont.

UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT. This Water District provides wholesale water service to local water suppliers. About 60,000 acre-feet of imported water is served each year, with the majority of the water being used for groundwater recharge.

WATER REPLENISHMENT DISTRICT OF SOUTHERN CALIFORNIA (WRD). This Water District manages groundwater in the West and Central Basins for 3.5 million residents in 43 cities of southern Los Angeles County, including the cities in the lower San Gabriel River Watershed.

Water Quality

Decades of polluted urban runoff into the San Gabriel River and Pacific Ocean have degraded the quality of surface waters to levels that are unsafe for human contact.

The Los Angeles Regional Water Quality Control Board (Regional Board) regulates ground and surface water quality in the Los Angeles Region, including the coastal watersheds of Los Angeles and Ventura Counties, along with very small portions of Kern and Santa Barbara Counties. The LA Regional Board is one of nine Regional Boards overseen by the State Water Resources Board. The Regional Board oversees water quality for 4,447 square miles of land, including offshore islands; 1,115 miles of streams; 2,107 acres of lakes; and 120 miles of coastline.

Water quality associated with the San Gabriel River is defined by the Regional Board using the concepts of "beneficial uses" and "impaired reaches."

BENEFICIAL USES

Beneficial uses are water quality milestones for water that need to be attained and maintained over time. Water may be a reservoir, lake, stream, river segment or estuary. The State Water Resources Control Board has designated 21 "Beneficial Uses" for surface waters such as contact recreation or groundwater recharge.

The San Gabriel River is divided into multiple river segments, tributaries and reservoirs according to their beneficial use designations. Eleven water body segments or lakes fall within the San Gabriel River Corridor Master Plan project area. Each location has specific beneficial uses as outlined below. They are designated as "existing," "proposed," or "intermittent" (streams that only run during the rainy season). All are existing unless indicated with a "P" for proposed, or "I" for intermittent. The nature of each beneficial use is implied by its title. For a more precise definition of each beneficial use, refer to the Los Angeles Regional Water Quality Control Board Basin Plan. The uses are not listed in preferential order.

Reach 1

West Fork San Gabriel River

- Municipal and Domestic Supply (P)
- Groundwater Recharge
- Water Contact Recreation
- Non-contact Water Recreation
- Warm Freshwater Habitat
- Cold Freshwater Habitat
- Wildlife Habitat
- Rare, Threatened, or Endangered Species
- Spawning, Reproduction, and/or Early Development
- Wetland Habitat

Reach 2

Morris and San Gabriel Reservoirs

- Municipal and Domestic Supply
- Industrial Service Supply
- Industrial Process Supply
- Agricultural Supply
- Groundwater Recharge
- Hydropower Generation
- Water Contact Recreation (P in Morris)
- Non-contact Water Recreation
- Warm Freshwater Habitat
- Cold Freshwater Habitat
- Wildlife Habitat
- Spawning, Reproduction, and/or Early Development (Morris only)

Figure 2-70. The San Gabriel Dam is a source of local water supply.

Figure 2-71. On occasion, the river is used for baptisms by local area churches.

San Gabriel River: Main Stem

- Municipal and Domestic Supply
- Industrial Service Supply
- Industrial Process Supply
- Agricultural Supply
- Groundwater Recharge

COURTESY DAN SLATER

Figure 2-72. Water contact recreation includes river crossings on horseback.

- Water Contact Recreation
- Non-contact Water Recreation
- Warm Freshwater Habitat
- Cold Freshwater Habitat
- Wildlife Habitat
- Spawning, Reproduction, and/or Early Development

Reach 3

San Gabriel River

- Municipal and Domestic Supply
- Industrial Service Supply
- Industrial Process Supply
- Agricultural Supply
- Groundwater Recharge
- Water Contact Recreation
- Non-contact Water Recreation
- Warm Freshwater Habitat
- Cold Freshwater Habitat
- Wildlife Habitat
- Rare, Threatened, or Endangered Species

Santa Fe Flood Control Basin

- Municipal and Domestic Supply (P)
- Groundwater Recharge (I)
- Water Contact Recreation (P)
- Non-contact Water Recreation (I)
- Warm Freshwater Habitat (I)
- Wildlife Habitat
- Wetland Habitat

Reach 4

San Gabriel River

- Municipal and Domestic Supply (P)
- Groundwater Recharge (I)
- Water Contact Recreation (I)
- Non-contact Water Recreation (I)
- Warm Freshwater Habitat (I)
- Wildlife Habitat

Whittier Narrows Flood Control Basin

- Municipal and Domestic Supply (P)
- Groundwater Recharge

Figure 2-73. Trails are a good example of non-contact river uses.

- Water Contact Recreation
- Non-contact Water Recreation
- Warm Freshwater Habitat
- Wildlife Habitat
- Rare, Threatened, or Endangered Species (P)

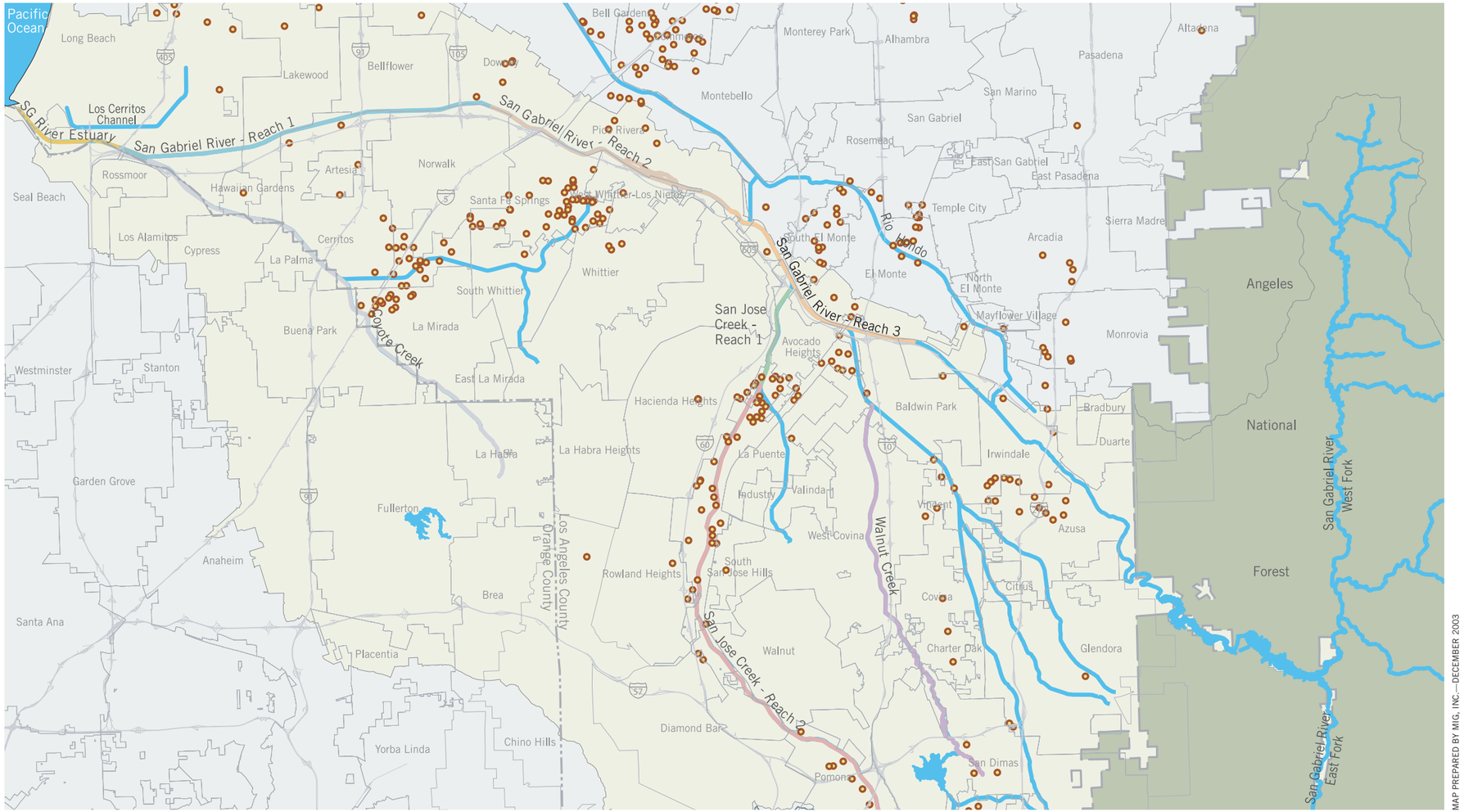
COURTESY BONTERRA CONSULTING

Figure 2-74. Wildlife sightings such as this Great Blue Heron occur along many stretches of the river.

Reach 5

San Gabriel River: Whittier Narrows to Firestone Boulevard

- Municipal and Domestic Supply (P)
- Industrial Service Supply (P)
- Industrial Process Supply (P)
- Groundwater Recharge (I)
- Water Contact Recreation
- Non-contact Water Recreation
- Warm Freshwater Habitat (I)
- Wildlife Habitat



Map 2-12. Impaired reaches.