Water Supply

This section discusses the current and future water supply within Central Basin's service area

3.1 Overview

It is Central Basin's mission to ensure a safe, adequate and reliable supply of water for the region it serves. However, with a limited supply and growing demand for water, the task of meeting this mission is becoming increasingly challenging.

Sixty years ago the average customer agency in Central Basin relied completely on groundwater. Today, however, it relies on a more diverse mix of water resources: 68% groundwater, 22% imported, 2% recycled water (only M&I), and conservation efforts have made up 8%. It is projected that by 2030, the resource mix on average will be 56% groundwater, 23% imported, 5% recycled water, with conservation meeting the remaining 16%. Diversification of water supplies has become one of the District's answers to ensuring a reliable supply of water for its service area.

This section provides an overview of the current and future water supplies needed to meet the expected demands of Central Basin, including a review of the District's current and projected water supply mix, a description of each water source that Central Basin's customer agencies currently rely on, and expected future supplies that Central Basin is planning and/or developing to meet its region's future demands.

3.2 Central Basin's Water Supply Portfolio

Since its formation in 1952, Central Basin has fulfilled its responsibility of providing its customer agencies with supplemental supplies to ensure reliability. Today, diversification is the key to an ample future supply of water throughout its service area. As illustrated in Figure 3-1, Central Basin's supply portfolio has changed through the years.

Similar to creating a balanced investment portfolio to reduce risk, the District plans to further diversify the water resource mix over the next 25 years, with the expansion of the District's recycled water system, increased conservation efforts, and groundwater storage opportunities. The District's dependence on traditional sources of water (groundwater and imported) will continue to decrease with the expansion of these alternative resources. Figure 3-1 and Table 3-1 show the historical, current and projected water supply portfolio that the District is anticipating meeting by the year 2030.

Figure 3-1
Historical, Current & Projected Water Supplies

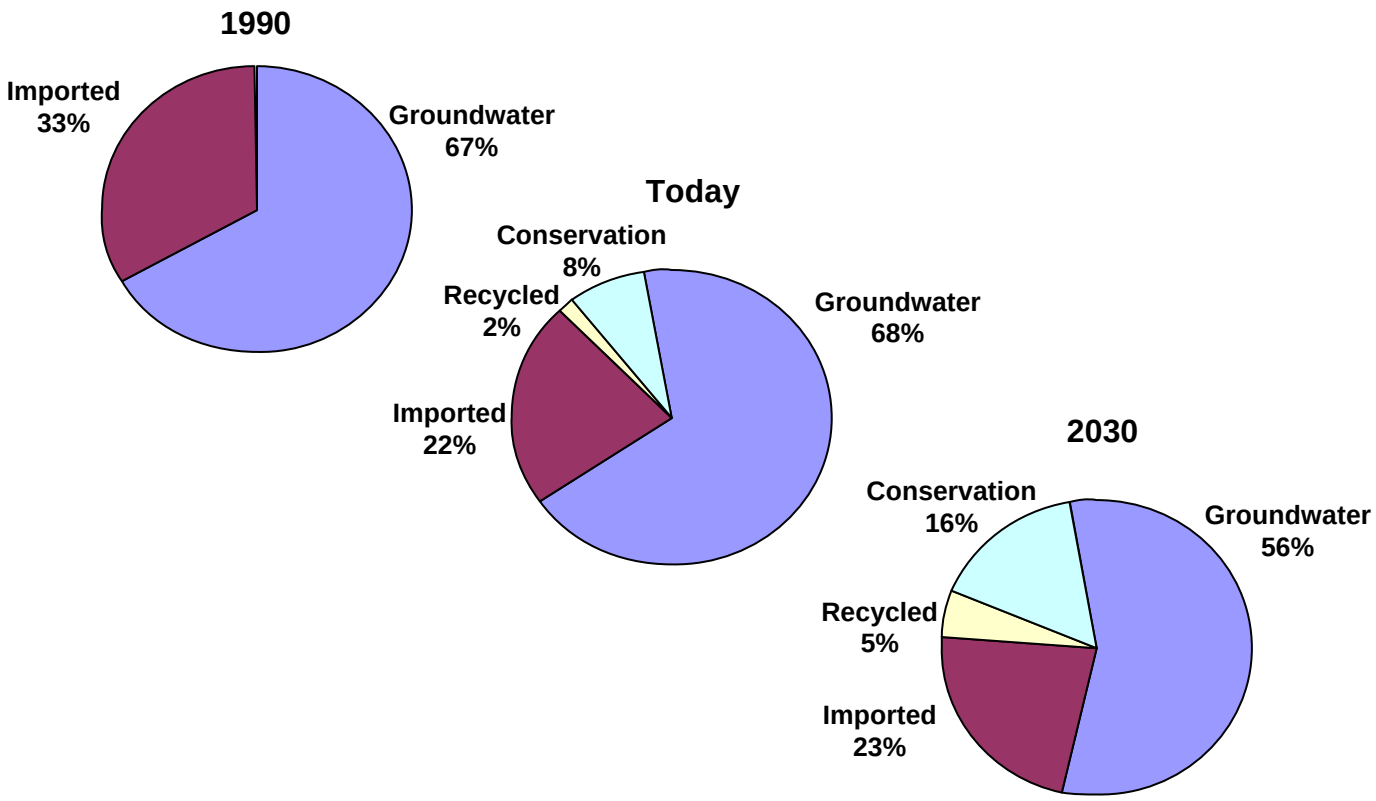


Table 3-1
Historical, Current & Projected Retail Water Supplies
(In Acre-feet)

Type of Water	FY 1990	Today[1]	2030
Groundwater[2]	187,931	186,549	202,000
Imported Water[3]	94,059	61,033	82,535
Recycled Water[4]	-	5,217	17,900
Total	**281,989**	**252,799**	**302,435**
Conservation[5]	-	21,100	58,400
Total	**281,989**	**273,899**	**348,835**

[1] Sales based upon FY 2004-05.
[2] Groundwater production within Central Basin service area only, including imported groundwater production from Main San Gabriel Basin (Avg 42,000 AFY).
[3] Imported retail use only; does not include replenishment deliveries (i.e. Spreading or Barrier).
[4] Recycled retail use only; does not include replenishment deliveries (i.e. Spreading or Barrier).
[5] Conservation consists of *active* and *passive* savings according to the District's projected estimates.

3.3 Central Basin's Water Source

3.3.1 Imported Water Supply

Central Basin relies on approximately 90,600 acre-feet per year (AFY) of imported water from the Colorado River and State Water Project to meet the District's retail and replenishment demands. MWD receives this supply from these two major water systems that supplies a majority of the Southern California region.[1]

Colorado River

MWD was established to develop a supply from the Colorado River. And its first mission was to construct and operate the Colorado River Aqueduct (CRA), which can deliver roughly 1.2 Million Acre-feet (MAF) per year. Under its contract with the federal government, MWD has a basic entitlement of 500 thousand acre-feet per year of Colorado River water. MWD also holds a priority for an additional 662 taf per year. MWD can obtain water under this priority when the U.S. Secretary of the Interior determines that either one or both of the following exists:

- surplus water; and/or
- water is apportioned to, but unused by, Arizona and/or Nevada.

MWD and the State of California have acknowledged that they could obtain less water from the Colorado River in the future than they have in the past, but the lack of clearly quantified water rights hindered efforts to promote water management projects. The U.S. Secretary of Interior asserted that California's users of Colorado River water had to limit their use to a total of 4.4 million acre feet (MAF) per year, plus any available surplus water. The resulting plan, known as "California's Colorado River Water Use Plan" or the "California Plan," characterizes how California would develop a combination of programs to allow the state to limit its annual use of Colorado River water to 4.4 MAF per year plus any available surplus water. The Quantification Settlement Agreement (QSA) among the California agencies is the critical component of the California Plan. It establishes the baseline water use for each of the agencies and facilitates the transfer of water from agricultural agencies to urban uses.

In the context of the QSA, MWD has identified a number of storage and transfer programs that could be used to achieve long-term development targets for a full CRA, and it has entered into or is exploring agreements with a number of agencies.

State Water Project

[1] The Los Angeles Aqueduct, a third aqueduct to southern California, supplies imported water from the eastern Sierra Nevada region to the City of Los Angeles.

California's State Water Project (SWP), MWD's second main source of imported water is the nation's largest state-built water and power development and conveyance system. It includes facilities—pumping and power plants; reservoirs, lakes, and storage tanks; and canals, tunnels, and pipelines—that capture, store, and convey water from the Lake Oroville watershed in Northern California to 29 water agencies in Central and Southern California. Planned, designed, constructed and now operated and maintained by the California Department of Water Resources (DWR), this unique facility provides water supplies for 23 million Californians and for 755,000 acres of irrigated farmland.

The original State Water Contract called for an ultimate delivery capacity of 4.2 MAF, with MWD holding a contract for 2,011 MAF. More than two-thirds of California's drinking water, including all of the water supplied by the SWP, passes through the San Francisco- San Joaquin Bay-Delta (Bay-Delta). For decades, the Bay-Delta system has experienced water quality and supply reliability challenges and conflicts due to variable hydrology and environmental standards that limit pumping operations.

In 1999, MWD's Board of Directors set new goals for the SWP with the adoption of its CALFED Policy Principles. These goals committed MWD to water quality objectives, the development of 0.65 MAF minimum dry-year supply from the SWP by 2020, and average annual deliveries of 1.5 MAF (excluding transfers and storage programs along the SWP). To achieve these goals while minimizing impacts to the Bay-Delta ecosystem, MWD would maximize deliveries to storage programs during wetter years, implement a number of source water qualities and supply reliability improvements in the Delta, remove operational conflicts with the Central Valley Project (CVP), and better coordinate planning and operations between the SWP and CVP.

Types of Imported Supplies

MWD offers different types of imported water to its member agencies depending on the ultimate use. Among them, Central Basin has delivered Non-Interruptible Water (treated full-service), Seasonal Treated Replenishment Water, and Seasonal Untreated Replenishment Water.

Non-Interruptible Water is the treated firm supply that is available all year round. Central Basin delivers an average of 63,000 AFY of non-interruptible water annually. It is used as the main supplemental supply of cities and water agencies and has historically been used as the main supply for the Alamitos Barrier; however, the City of Long Beach now provides water for that barrier.

Seasonal Treated Replenishment Water, also known as the "In-Lieu" water is delivered to customer agencies that are eligible to offset groundwater production with imported water. This program incentivizes customer agencies to take

imported surplus water which indirectly replenishes the groundwater basin. This surplus water is purchased at a discount rate in exchange for leaving groundwater in the basin for no less than a year so that it can be used subsequently during dry years.

Seasonal Untreated Replenishment Water, better known as "Spreading" water, is delivered to the replenishment spreading grounds in the Montebello Forebay. Spreading water does not require treatment and is generally provided during the seasonal months (October through April), which allows for it to be purchased at a discounted rate. WRD is the sole purchaser of spreading water, and the amount varies year to year depending on replenishment needs of the basin, with the long term average being approximately 27,600 acre-feet per year.

3.3.2 Groundwater Supply

Groundwater has for many years been the primary supply of water within Central Basin's service area. In fact, it was the sole source of water supply until the Central Groundwater Basin (Basin) was overdrafted in the late 1940's. Today, the average customer agency in Central Basin relies on groundwater production for 62% of its water supply; although there still remain a few agencies in the District's service area that rely exclusively on groundwater to meet all current water needs.

Ultimately, the extensive overpumping of the Basin over the years led to critically low groundwater levels. This overpumping of the Basin resulted in a legal judgment, or adjudication, that limited the allowable extraction that could occur in any given year and assigned water rights to basin pumpers. The adjudicated water rights were greater than the Basin yield; therefore, the Basin was operating with an annual overdraft. In order to address this overdraft, imported and recycled water sources and a means to purchase these sources was required. The groundwater producers (pumpers) in the area, which are members of the Central Basin Water Association, led the creation of the Water Replenishment District of Southern California (WRD), which manages the replenishment of the groundwater basin.

In 1959, the State Legislature enacted the Water Replenishment Act, enabling the water associations for the basin to secure voter approval for the formation of the "Central and West Basin Water Replenishment District" (now referred to as the Water Replenishment District of Southern California or "WRD") to be the permanent agency in charge of replenishing the Basin. The State Legislature has vested in WRD the statutory responsibility to manage, regulate, replenish, and protect the quality of the groundwater supplies within its boundaries for the beneficial use of the approximately 3.5 million residents and water users who rely upon those groundwater resources to satisfy all or a portion of their beneficial water needs.

Although the water rights have been bought, sold, exchanged, or transferred over the years, the total amount of allowable extraction rights within the entire groundwater basin

has remained virtually the same. The adjudicated pumping rights available within Central Basin's service area totaled 163,960 AF. However, not all of these water right holders are water retail agencies. Many of these holders are nurseries, businesses, cemeteries, and private entities that make up approximately 23% (37,287 AF) of the total water rights. Shown below in Table 3-2, are all of the water retailers' adjudicated groundwater rights in Central Basin's service area for fiscal year 2003-04.

Table 3-2
Groundwater Pumping Rights 2003-2004
(AFY)

Central Basin Retail Agencies	Adjudicated Pumping Rights in Central Basin
Bellflower-Somerset MWC	4,313
California Water Service Company-East LA	11,774
California Water Service Company-Commerce	5,081
City of Bell Gardens	1,914
City of Cerritos	4,680
City of Downey	16,553
City of Huntington Park	3,853
City of Lakewood	9,423
City of Lynwood	5,337
City of Montebello	386.5
City of Norwalk	1,267
City of Paramount	5,883
City of Santa Fe Springs	4,036
City of Signal Hill	2,022
City of South Gate	11,183
City of Vernon	8,039
County LA- Rancho Los Amigos	490
La Habra Heights County Water District	2,498
Maywood Mutual Water Company No.1	741
Maywood Mutual Water Company No.2	912
Maywood Mutual Water Company No.3	1,407
Orchard Dale Water District	1,107
Park Water Company	1.3
San Gabriel Valley Water Company	2,616
Southern California Water Company	16,439
Suburban Water Systems	3,721
Walnut Park Mutual Water Company	996
TOTAL	**126,673**

Source: Central Basin Watermaster Report, 2004

Although most of the groundwater supply is extracted from the Central Basin, there are a number of water retailers that retain groundwater rights within the Main San Gabriel Basin that are extracted and imported within their Central Basin service area. The Main San Gabriel Basin underlies most of the San Gabriel Valley, above Central Basin. It is bounded by the San Gabriel Mountains to the north, San Jose Hills to the east, Puente Hills to the south, and by the Raymond Fault and a series of other hills to the west.

The total amount of water extracted from the Main San Gabriel Basin and imported within Central Basin service area averages approximately 42,000 AFY. Below in Table 3-3, displays the water retailers and the amount produced from this adjoining basin for the past five fiscal years.

Table 3-3
Amount of Groundwater Pumped from Main San Gabriel Basin
(In Acre-Feet)

Water Retailer	2000	2001	2002	2003	2004
California Domestic Water Co.	19,886	18,603	21,204	21,338	21,233
San Gabriel Valley Water Co.	279	300	1,500	1,454	1,450
Suburban Water Systems	13,570	12,885	13,773	11,497	12,353
City of Whittier	8,952	8,107	8,116	7,411	8,021
TOTAL	**42,687**	**39,895**	**44,593**	**41,700**	**43,057**

Source: Central Basin Watermaster Reports

As illustrated in Table 3-4, the total amount of groundwater produced over the past five years in the Central and Main San Gabriel Basins has remained fairly consistent. The amount of groundwater produced ranges from 94% to 98% of the total groundwater supply available.

Table 3-4
Total Amount of Groundwater Pumped
(In Acre-Feet)

Basin Name	2000	2001	2002	2003	2004
Central Groundwater Basin[1]	158,516	153,242	157,036	152,802	151,785
Main San Gabriel Basin[2]	39,895	44,593	41,700	43,057	40,778
Total	**201,203**	**193,137**	**201,629**	**194,502**	**194,842**
% of Total Water Supply	**98%**	**94%**	**98%**	**94%**	**95%**

[1] Includes Central Basin's service area groundwater production.
[2] Water Production from Main San Gabriel Basin and imported into Central Basin's service area.

The total amount of groundwater projected to be extracted over the next 25 years will be fairly consistent due to the adjudication in both basins. The economic costs to pump groundwater versus the purchases of imported water will pressure water retailers to maximize their groundwater rights. Therefore, the total amount of groundwater produced is projected to range in the 98% percentile of available supply, as illustrated in Table 3-5.

Table 3-5
Total Amount of Groundwater Projected to be Pumped[3]
(In Acre-Feet)

Basin Name	2010	2015	2020	2025	2030
Central Groundwater Basin [1]	160,000	160,000	160,000	160,000	160,000
Main San Gabriel Basin[2]	42,000	42,000	42,000	42,000	42,000
Total	**202,000**	**202,000**	**202,000**	**202,000**	**202,000**
% of Total Water Supply	**98%**	**98%**	**98%**	**98%**	**98%**

[1] Includes Central Basin's service area groundwater production.
[2] Water Production from Main San Gabriel Basin and imported into Central Basin's service area.
[3] There is no increase in groundwater production due to the fact that the basin is adjudicated and pumping rights are limited to each producer.

Groundwater Recharge

For the past 42 years, WRD has replenished the Basin through "Spreading Grounds" and prevented further seawater intrusion by injecting recycled and imported water into the Alamitos Barrier, which were created by the Los Angeles County Flood Control District (LACFCD) and owned and operated by the Los Angeles County Department of Public Works.

WRD assesses a groundwater production fee, known as their "Replenishment Assessment", to pumpers in the Basin. This assessment provides funds which WRD uses to purchase and produce water for both spreading and injection to replace groundwater pumped, and create hydrological barriers to seawater intrusion. The available supply of replenishment water to physically recharge the basins can be classified as follows:

- **Local water**- Storm flows from the San Gabriel River, Rio Hondo and other waterways within the San Gabriel Valley and flow obligations under the San Gabriel River Judgment with the Upper Area of the Central Basin, defined as "Make-up Water."
- **Recycled water**- Recycled water purchased from the County Sanitation District of Los Angeles County for deliveries at the Montebello Forebay Spreading Grounds, or highly treated water for injection into the Alamitos seawater barrier.
- **Imported water**- Purchased untreated imported water from Central Basin for deliveries at the Montebello Spreading Grounds, or treated imported water from the City of Long Beach for injection into the Alamitos seawater barrier.

WRD also encourages in-lieu replenishment of the Basin. Under the In-Lieu program, pumpers are encouraged through a financial incentive to purchase surplus imported water from Central Basin "in-lieu" of pumping groundwater.

Table 3-6 summarizes the historical amounts of imported water purchased to replenish the Basin at both the Spreading Grounds and at the Alamitos Barrier.

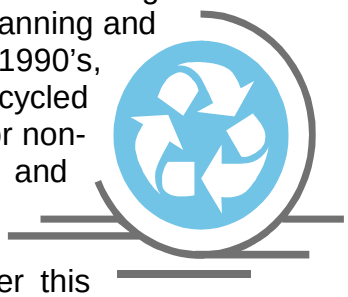
Table 3-6
Historical Imported Water Replenishment Deliveries
(In Acre-Feet)

Fiscal Year	Spreading Water	Barrier Water[1]	Total
1990	49,531	5,756	55,287
1991	50,785	6,168	56,953
1992	49,229	5,757	54,986
1993	22,987	5,261	28,248
1994	19,239	4,145	23,384
1995	23,008	3,496	26,504
1996	13,693	5,269	18,962
1997	26,440	5,739	32,179
1998	1,562	5,336	6,898
1999	-	5,330	5,330
2000	45,037	6,169	51,206
2001	23,451	5,398	28,849
2002	41,268	6,062	47,330
2003	17,297	3,479	20,776
2004	21,788	-	21,788
2005	27,785	-	27,785

Source: CBMWD Wateruse Database, 2005
[1] Barrier supplies transferred to the City of Long Beach in 2003.

3.3.3 Recycled Water Supply

Recycled water is one of the cornerstones of Central Basin's efforts to augment local supplies and reduce dependence on imported water. Since the planning and construction of Central Basin's recycled water system in the early 1990's, Central Basin has become a leader in producing and marketing recycled water. This new supply of water assists in meeting the demand for non-potable applications such as landscape irrigation, commercial and industrial processes, and seawater barriers. Recycled water is a resource that is reliable and environmentally beneficial to the region. It is only limited by the infrastructure needed to deliver this source of water. With approximately 198 site connections, Central Basin has delivered an average of 3,800 AF per year both inside and outside of the District's service area. This upcoming fiscal year, the District anticipates recycled water sales to reach 5,000 AF.



In addition, the City of Cerritos has its own recycled water system that currently treats and supplies within its City's boundaries and its neighbor, the City of Lakewood, a total of 2,400 AF per year. Together, both these recycled water programs plan to offset potable supplies by 7,400 AF this next fiscal year.

Recycled water deliveries within Central Basin are projected to reach 10,500 AF by year 2010. Refer to a more detailed description of Central Basin's water recycling program in Section 8 of this Plan.

3.4 Alternative Water Supply Projects

3.4.1 Conjunctive Use Groundwater Storage

Conjunctive Use can be defined as the coordinated management of surface and groundwater supplies to increase the yield of both supplies and enhance water supply reliability in an economic and environmentally responsible manner. Central Basin sees the development of Conjunctive Use Storage Programs as part of the District's core responsibility to ensure a reliable supply of water for its service area. If done in a publicly responsible manner, groundwater storage can be viewed as an additional source in diversifying our water resource supply portfolio.

The potential benefits of a Conjunctive Use program include:

- Operational flexibility for groundwater production;
- Increased yield of the basin;
- More efficient use of surplus surface water during wet years;
- Financial benefits to groundwater users;
- Better distribution of water resources; and
- Increased measures of reliability.

At this time there are programs available for water retailers to create groundwater storage both within and outside of the Basin judgment. Included is the availability for a District-sponsored storage program with MWD that retail agencies with imported water connections could partake in. The size of such a program would depend on retailers' total demand and the amount that they could realistically shift of groundwater to imported water.

3.4.2 Water Transfers & Exchanges

Water transfers and exchanges are management tools to address increased water needs in areas of limited supply. Although they do not generate a new supply of water, they do better distribute water from where it is abundant to where it is limited.

MWD, in recent years, has played an active role statewide in securing water transfers and exchanges as part of their IRP goals. Although Central Basin is a member of MWD, there has not been a compelling reason or opportunity to pursue transfers directly.

3.4.3 Desalinated Water

Desalination is viewed as a way to develop a local, reliable source of water that assists agencies in reducing their demand on imported water, reducing groundwater overdraft, and in some cases make unusable groundwater available for municipal uses. Although Central Basin currently has not identified any projects for desalination of seawater or impaired groundwater, the District is a strong support of the endeavor. This additional source of water supply would provide greater water reliability for the District.

In 2005, the District passed a resolution supporting the efforts of its sister agency West Basin Municipal Water District (WBMWD) in the development of a seawater desalination project. WBMWD has been operating a desalination pilot project since May 2003 to identify optimal performance conditions and evaluate the water quality of the water produced. The project is located at the El Segundo Power Plant and processes 40 gallons per minute.