

SECTION 2

WATER SYSTEM DESCRIPTION

2.1 DISTRICT HISTORY AND PURPOSE

Monte Vista Water District (District) is a county water district that was officially formed in 1927 under CWC, County Water District Law, Division 12, Section 30000 et seq. The District's origins date back to the early 1900s, when a land developer first surveyed a tract of land bounded by the railroad tracks and Phillips Street to the north and south, and the wash and State Street to the east and west. This area of land was then known as the "Monte Vista Land Tract" and was used largely for agricultural purposes, primarily citrus orchard farming. Water that was needed for irrigation for the numerous orange and lemon groves in the area was provided by the Limited Mutual Water Company. Limited Mutual Water Company later made the decision to provide domestic water service, and a number of other companies began to express a similar interest. The desire to form a water district under state law led to the election and formation of the District.

After its formation, the District began the long process of purchasing and accumulating facilities for providing domestic water service, including reservoirs, pipelines, pumps, wells, and other water companies. Land was purchased for facility development, and several annexations were accomplished over the decades, the largest of which occurring in 1989 with the addition of a portion of San Bernardino County Water Works #8 service area. This annexation included a population of over 12,000, increasing the total population served by the District to over 46,000 and resulting in peak demand of 14 million gallons per day (mgd) in the 1990s.

In the early days, groundwater was the major water supply. Enough naturally occurring recharge meant the groundwater was sufficient to meet the needs of the area. Gradually, additional water supplies were identified and developed to meet periods of increased demand and also to blend with high-nitrate groundwater supplies in order to meet state and federal regulatory standards. After the construction of the Colorado River Aqueduct in 1935, connections to that supply source assisted in bringing supplemental water to the rapidly growing region. In the 1980s, the District, along with the cities of Chino, Chino Hills, Ontario, and Upland, entered into a joint powers authority agreement to create the Water Facilities Authority (WFA) treatment plant. The WFA can treat up to 81 mgd of surface water imported from northern California through the State Water Project.

More recently, due to the increased unreliability of imported water supplies, the District has made key acquisitions to further develop its local water supply portfolio. In February 1999, the District purchased the Monte Vista Irrigation Company, a private water company founded in 1908, previously involved with agricultural and domestic water supply to the cities of Montclair and Ontario. Through this acquisition, the District increased its production rights in the Chino Groundwater Basin by approximately 1,000 acre-feet per year (AFY). In 2010, the District purchased 300 shares in the San Antonio Water Company, a local mutual stock water company, providing access to approximately 800 AFY of additional water supply.

Finally, the District has successfully implemented a recycled water distribution system. The system currently delivers 300 AFY of recycled water through a separate non-potable distribution system for landscape irrigation. The District eventually plans to deliver 430 AFY of recycled water to offset demand on its potable water system.

At the current time, the District relies on approximately 75 percent of its water supply from groundwater and other local supplies and 25 percent from imported water. These percentages vary according to changing supply conditions.

In addition to its retail customers, the District provides wholesale water supply to the City of Chino Hills. Under the provisions of a long-term agreement executed in July 1998, the District is contracted to deliver to Chino Hills up to 20.22 mgd. Since initiation of full deliveries in 1999, the District has delivered between 7,500 and 14,000 AFY of water to the City under the terms of the agreement.

In 2009, the District Board of Directors adopted the District's 2008 Water Master Plan as its Capital Improvement Plan (CIP) document, addressing water system, supply, and storage infrastructure needs for the next 30 years. The District's Financial Master Plan was most recently updated in January 2016 to provide a mechanism for funding the identified capital projects at a cost of nearly \$100 million. Since adoption of its CIP, the District has completed replacement of several miles of pipeline, the construction of three groundwater wells, the development of a recycled water distribution system, and the purchase of San Antonio Water Company stock.

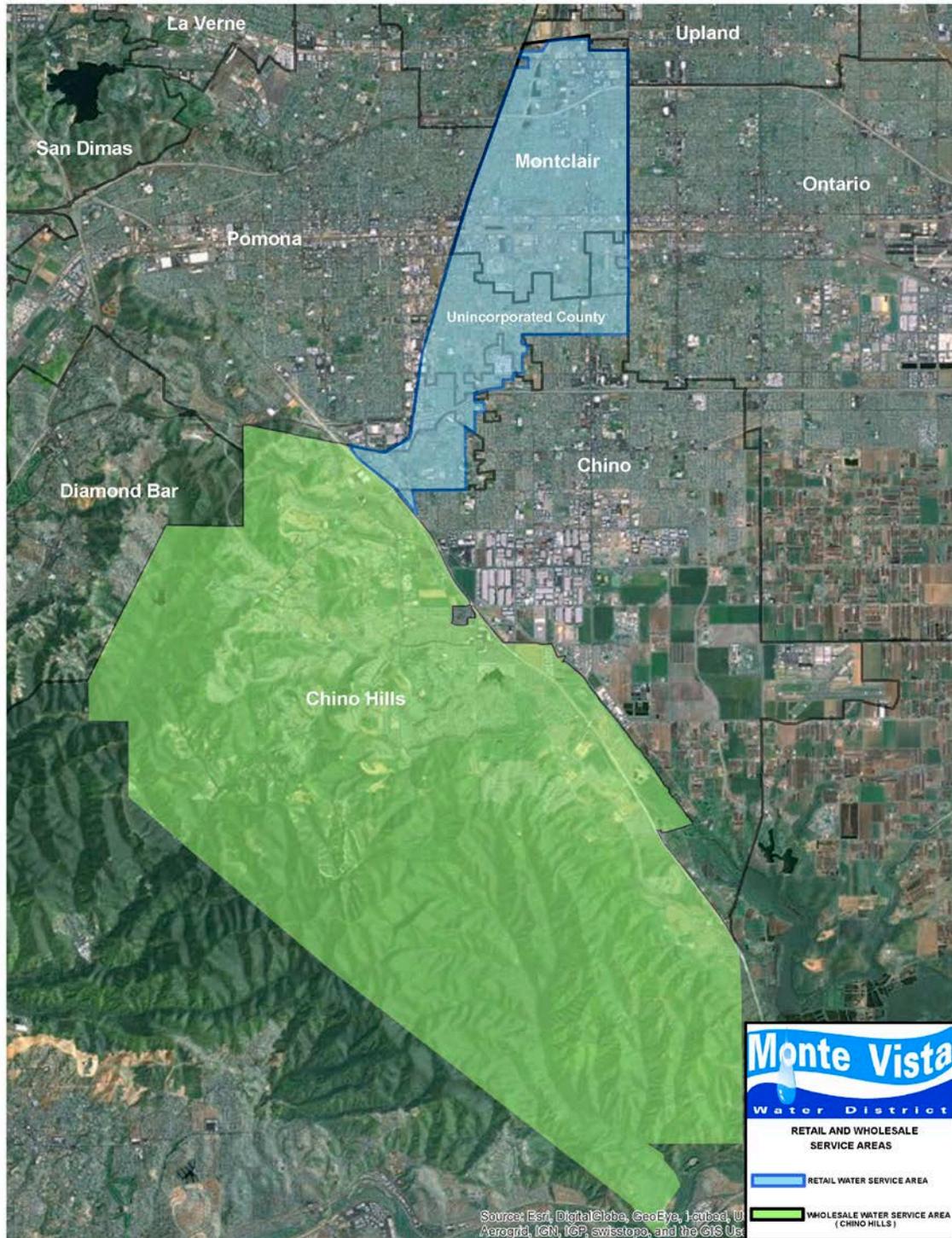
The operation of the District is governed by a Board of Directors, comprised of five members, elected at large within the District. The Board appoints, by majority vote, a General Manager/Secretary, Manager of Finance and Administration, and Legal Counsel, who serve at the pleasure of the Board. The District currently has 36 full-time employees who work in the areas of engineering, operations, maintenance, field service, customer service, billing, finance, human resources, public affairs and administration.

2.2 SERVICE AREA CHARACTERISTICS

2.2.1 Location

The District's retail service area contains approximately 6,120 acres (9.56 square miles) and includes the City of Montclair and portions of the City of Chino and unincorporated county areas. The retail service area lies adjacent to the westerly boundary of San Bernardino County, bordered by the cities of Upland and Claremont to the north, Ontario to the east, Chino, Chino Hills, and unincorporated areas to the south, and Pomona in Los Angeles County to the west. Interstate 10 runs east and west through the northern portion of the water service area and California State Route 60 runs east and west through the southern portion. The retail service area lies between 700 and 1,250 feet above mean sea level, rising gently northward toward the San Bernardino Mountains, approximately six miles from the northernmost boundary of the District.

**Figure 2-1:
District Retail and Wholesale Service Area**



The District's wholesale service area is comprised of the City of Chino Hills, which was incorporated in 1991 and currently encompasses 46 square miles.

See Figure 2-1 for a map of the District's retail and wholesale service areas.

2.2.2 Climate

The District is located in a general drainage area known as the Chino Basin, the largest such basin in the upper Santa Ana River Watershed. The Basin's southern California climate is generally Mediterranean, with low historical precipitation rates with wide periodic variations. The local climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds.

**Table 2-1:
Service Area ETo, Temperatures and Rainfall**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/ Average	
Average ETo¹ (inches)	1.96	2.28	3.71	4.64	5.23	5.93	6.50	6.38	4.87	3.4	2.28	1.70	48.88	
Temperature² (Fahrenheit)	Max	65.5	67.6	70.1	74.2	77.8	84.1	91.0	91.1	88.4	80.6	73.2	66.4	77.5
	Min	38.1	40.3	42.3	45.6	50.0	53.4	57.7	58.1	55.3	49.8	42.6	38.4	47.6
Rainfall² (inches)	3.56	3.49	2.82	1.22	0.35	0.10	0.01	0.07	0.26	0.78	1.56	2.77	16.97	

¹ California Irrigation Management Information System, Station #78 (Pomona), www.cimis.water.ca.gov.

² Western Regional Climate Center, Pomona Fairplex (047050), Monthly Climate Summary, Period of Record : 11/1/1893 to 1/20/2015, accessed May 17, 2016. <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7050>.

Table 2-1 lists the average annual Evapotranspiration (ET_o)⁵, temperatures, and rainfall for the District's service area. Average high temperatures range from 65 degrees Fahrenheit in January to 91 degrees Fahrenheit in July and August. Average annual precipitation is approximately 17 inches, with most precipitation typically occurring between November and April. There is usually little or no summer rainfall and often the predominant periods of rain do not occur until January. ETo averages 49 inches annually.

2.2.3 Population

The high cost of land in Los Angeles area increased the attraction of the Chino Basin and other suburban areas where land was still plentiful during the "urban sprawl" era. Following the economic downturn in the late 2000s, development is starting to return to the region, but there are differing opinions on how rapidly the area will grow in population during the coming decades.

⁵ ET is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is an indicator of how much water crops, lawns, gardens, and trees need for healthy growth and productivity. ET from a standardized grass is commonly denoted as ET_o.

Current and projected population estimates for the District’s retail service area are provided in Table 2-2. The 2015 population estimate was developed based on city growth estimates and known development in the service area since 2010 (see Appendix F). In order to project the District’s service area population for the next 25 years, it is necessary to divide the service area by municipal boundaries and use population estimates and growth projections for each subarea, as described in the footnotes to Table 2-2.

As shown in the table, the District’s retail service area population over the next 25 years is projected to grow by approximately 18 percent (from 55,581 to 65,649). The largest demographic shift in the foreseeable future for the District retail service area will be a continued increase in multi-family housing units in proportion to single-family housing units. This shift will largely be due to the development of high density residential properties within the North Montclair Downtown Specific Plan area of the City of Montclair. The maximum number of dwelling units projected for the Specific Plan area at build-out is 2,800.⁶

The current population of the District’s wholesale customer, the City of Chino Hills, is 77,596. The city projects its population will grow to 94,895, or 22 percent, in 20 years (a 2040 population projection was not provided). For more information on the city’s population projections, see Chino Hills’s 2015 UWMP.

In total, the District’s retail and wholesale population is projected to grow by just over 19 percent (from 133,177 to 158,849) by 2035.

**Table 2-2:
Service Area Population – Current and Projected**

Area	2015	2020	2025	2030	2035	2040
City of Montclair ¹	38,332	39,700	41,100	42,500	43,900	45,346
City of Chino ²	4,235	4,955	4,955	4,955	4,955	4,955
Unincorporated ³	13,014	14,352	14,605	14,854	15,099	15,347
Total Retail⁴	55,581	59,007	60,660	62,309	63,954	65,649
City of Chino Hills ⁵	77,596	89,314	91,137	92,997	94,895	---
Total Wholesale	77,596	89,314	91,137	92,997	94,895	---
Total Retail/Wholesale	133,177	148,321	151,797	155,306	158,849	---

Aligns with data in DWR Standardized Tables 3-1 R and 3-1 W.

¹ 2015 estimate: State of California, Department of Finance, E-1: City/County Population Estimates with Annual Percent Change — January 1, 2015 and 2016. Sacramento, California, April 2016. 2020-2040 estimates: Southern California Association of Governments, Population, Household, and Employment Integrated Growth Forecast, 2012.

² City of Chino, May 18, 2016.

³ 2015 estimate: Difference between 2015 total population and cities of Montclair and Chino population estimates. 2020-2040 estimates based on melded Montclair and Chino service area growth rates.

⁴ 2015 total based on city growth estimates and known development in the service area since 2010 (see Appendix F). 2020-2040 totals are sum of above data.

⁵ City of Chino Hills, May 12, 2016.

⁶ City of Montclair, May 16, 2016.

2.2.4 Land Use

The area within the District retail service boundary was once mainly used for agricultural purposes, namely citrus orchard farming. Over the course of time, this land has gone through a series of developments, ultimately resulting in the variety of land use types as seen today. The primary land use of this area is now residential, although there is still a large commercial sector as well as some light industrial/manufacturing and agricultural areas. The majority of land within the District's retail service area has already been built out, but there is significant potential for future in-fill developments. Figure 2-2 and Figure 2-3 show existing and future land uses in the retail service area (see Section 3.2).

2.3 DISTRICT WATER DISTRIBUTION SYSTEM

The District's water distribution system is comprised of groundwater wells, reservoirs, transmission and distribution pipelines, pump stations, pressure reducing stations, and a hydrogenation station. The system is used to meet the water demands of the District's retail and wholesale customers.

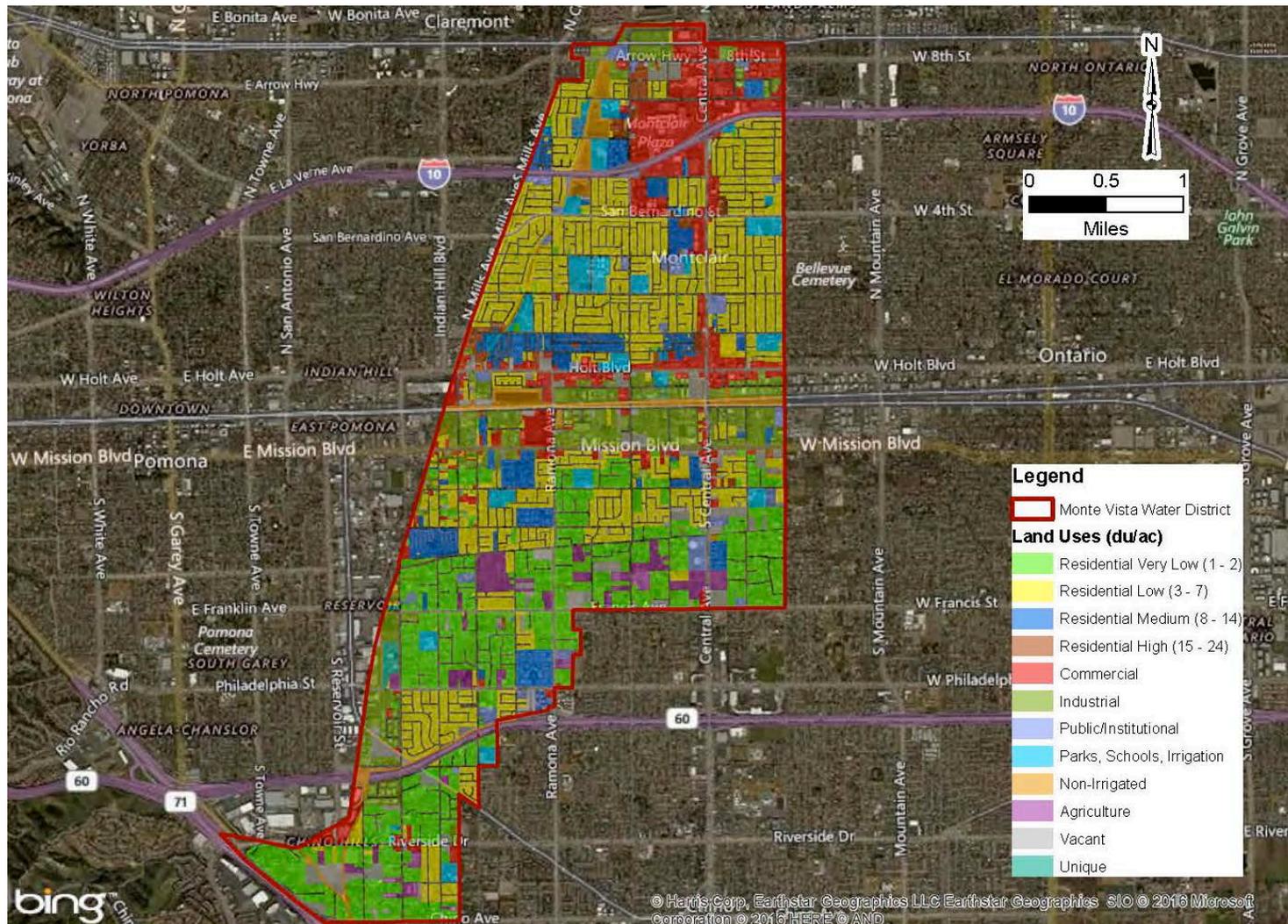
The District's retail water distribution system serves four separate pressure zones and includes approximately 198 miles of water distribution mains ranging in size from four to 42 inches in diameter, six reservoirs with a combined capacity of 12 million gallons, and seven active pump booster stations used to boost water throughout the system. The District currently has 12 active groundwater wells with a combined production capacity of approximately 28 mgd. Table 2-3 lists the District's wells and capacities.

The District's 2008 Water Master Plan calls for significant pipeline replacements in the next 30 years, as a large portion of its pipelines were constructed around the 1950s and are approaching the end of service life. The Master Plan also calls for the construction or rehabilitation of additional storage facilities to meet needed capacity at build-out.

The District's Water Master Plan includes recommendations for four new or renovated wells to provide for system reliability and continued groundwater pumping. As these wells are primarily to replace capacity of existing older wells which will soon go out of service, no additional capacity is expected within the master planning horizon.

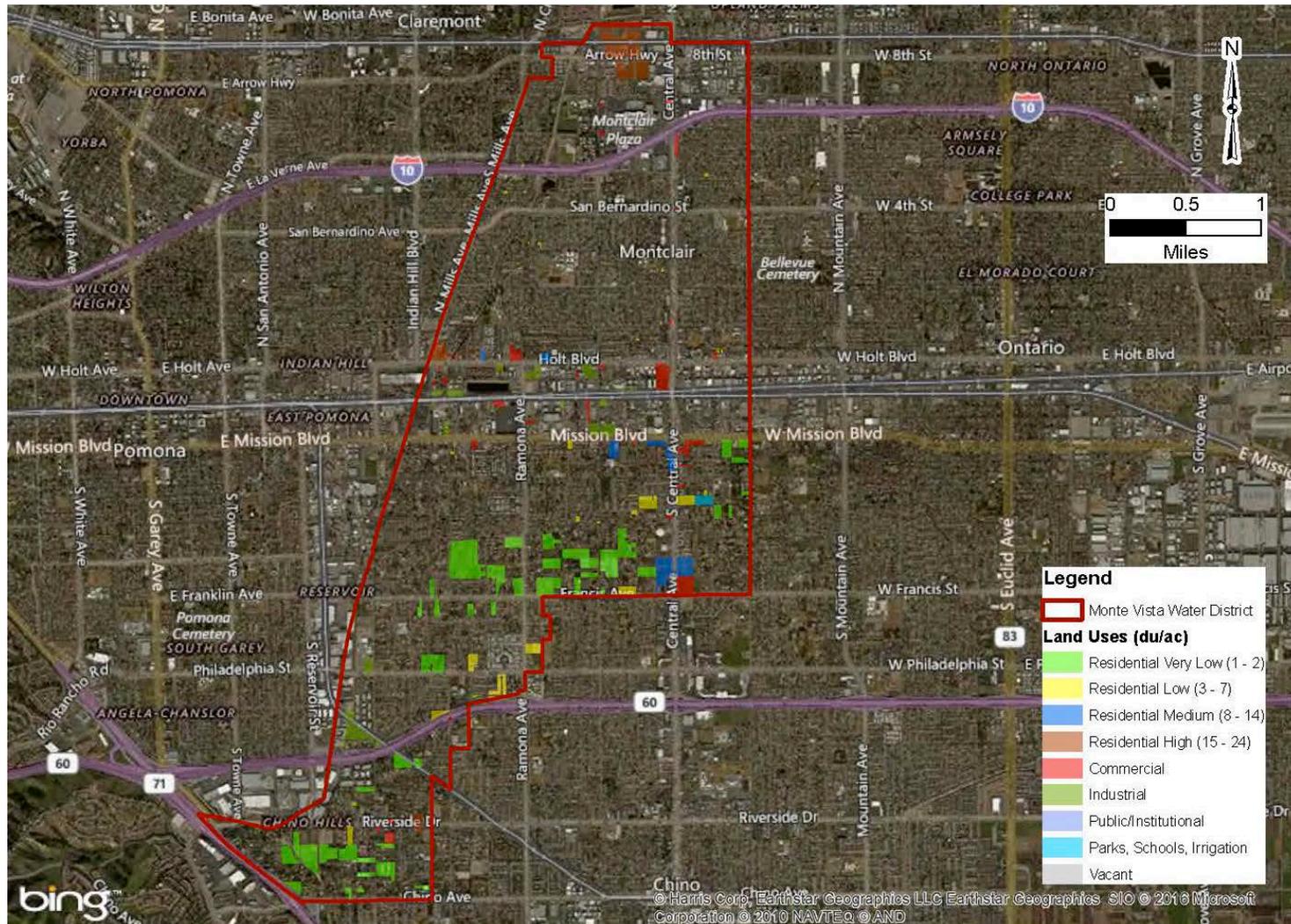
The District currently has six emergency interconnections with neighboring water agencies: Golden State Water Company (formerly Southern California Water Company) and the cities of Chino (x3), Upland, and Chino Hills. Over the last two decades, only the interconnection with Golden State Water has ever been activated, at which time the District delivered water to Golden State Water. The District has also discussed installing interconnections with the cities of Pomona and Ontario. Water is transported from the District to Chino Hills via transmission mains and ultimately delivered through two turnout facilities.

**Figure 2-2:
 Existing Land Uses – Retail Service Area**



IEUA/Arcadis, Land Use Based Demand Model Technical Memorandum, 2016 (Appendix G)

**Figure 2-3:
Future Land Uses – Retail Service Area**



IEUA/Arcadis, Land Use Based Demand Model Technical Memorandum, 2016 (Appendix G)

**Table 2-3:
Active Groundwater Wells and Total Production Capacity (mgd)**

Well Number	Capacity (mgd)
4	0.6
5	2
10	1.5
19	2.6
26	2.8
27	2.9
28	2.7
30	2.9
31	2.9
32	2.9
33 ¹	1.5
34	2.9
Total	28.2

¹ Full Well 33 capacity 2.9 mgd; the City of Chino owns half of the well's capacity.