WATER SUPPLY ASSESSMENT

CITY OF BAKERSFIELD

TORTUGA BAY WATER PARK PROJECT



MAY 2026

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SECTION 1 - INTRODUCTION

1.1 - Regulatory Requirement

Senate Bill 610 (Chapter 643, Statutes of 2001) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and land use decisions made by cities and counties. The statute requires detailed information regarding water availability to be provided to city and county decision-makers prior to approval of specified large development projects, which are subject to CEQA (the California Environmental Quality Act) approval. The statute also requires this detailed information to be included in the administrative record that serves as the evidentiary basis for an entitlement action by the city or county on such projects. The statute-required water supply assessment (WSA) must examine the availability and sufficiency of an identified water supply under normal year, single-dry-year, and multiple-dry-year conditions over a 20-year projection, accounting for the projected water demand of the Project in addition to other existing and planned future uses of the identified water supply.

The State Department of Water Resources' "Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001" (Guidebook) and the sample format presented in the Guidebook were used as guides in preparing this water supply assessment. The full text of Chapter 643, Statutes of 2001 (SB 610), is included in Appendix A.

1.2 - Projection Location and Description

The Project, 152 total acres in extent, is located within the Bakersfield city limits in the northwest area of the developed community (Figure 1-1 and Figure 1-2). The Project site is bordered by single-family residences to the west and single-family residences and a residential care facility to the north; there is currently no development on the Project site. The Project site would include:

- Northeast – Commercial/office uses consisting of a surgery center, medical offices, and two hotels.
- Northwest – General commercial uses consisting of a retail village, restaurants, and a gas station.
- Central – Water park, golf driving range, and parking.
- Southwest – Light Industrial uses consist of contractor storage yards, tool rental and equipment, truck repairing and overhauling shops, welding, metal fabricating, blacksmith shops, wholesale businesses, storage buildings and warehouses, and light manufacturing.
- Southeast – Heavy Industrial use consisting of uses allowed in the M-1 and alcohol and alcoholic beverages manufacture, automobile and truck parts manufacturer, freight and trucking yards and terminals, and glass product manufacture.

Figure 1-3 depicts the General Plan designations which would permit such usages.

Table 1-1 depicts the proposed land uses and their phasing.



Figure 1-1
Project Vicinity



Figure 1-2
Project Location

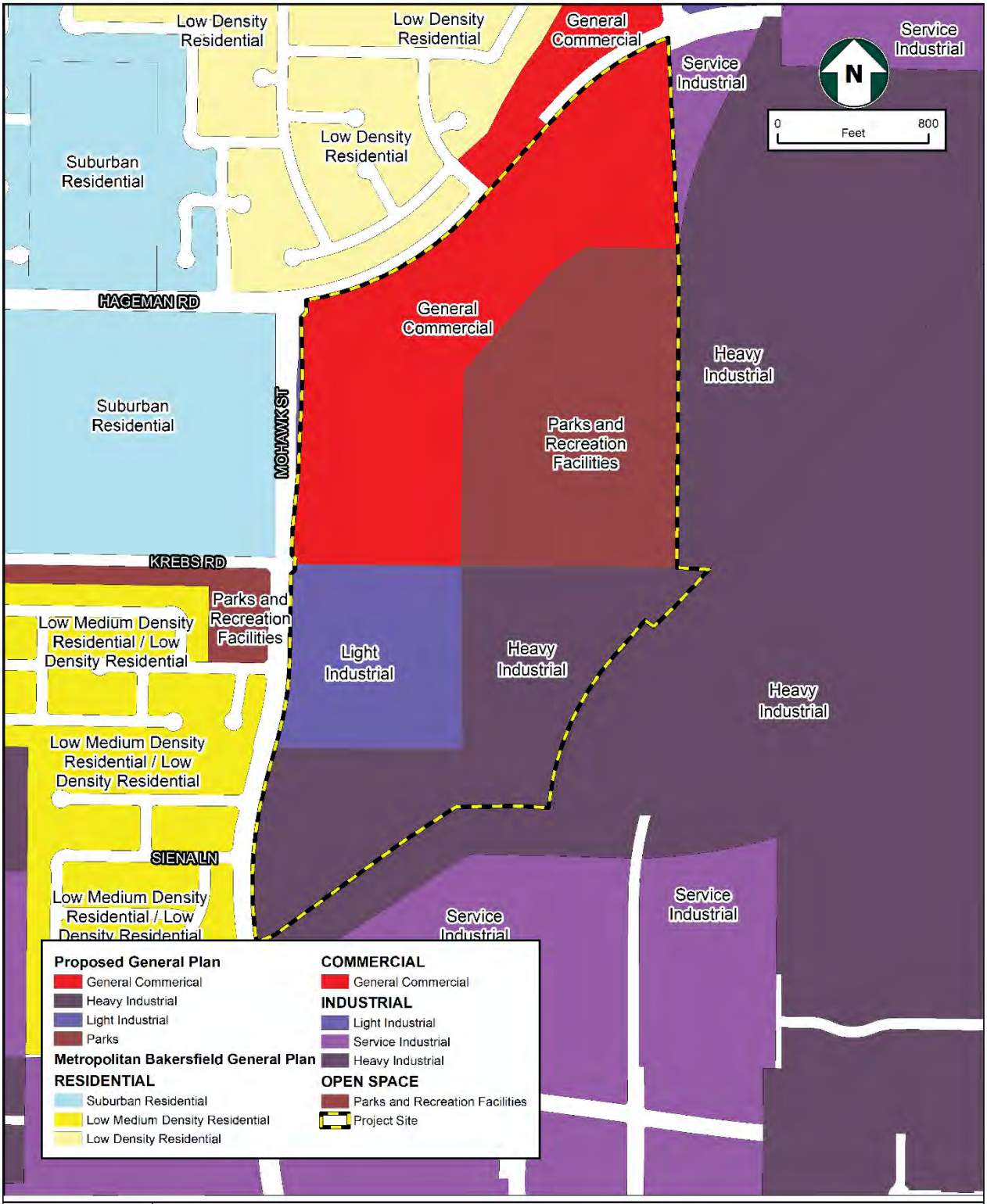


Figure 1-3
Proposed General Plan Designations

Table 1-1
Land Uses, Phasing

Proposed Project Component	Proposed Development Phase I (2025-2030)	Phase II (2030-2035)	Phase III (2035-2040)
Water Park	26.5 acres		
Golf Range	4.4 acres		
Medical Offices/Surgery Center		5.31 acres (37,000 sq ft)	3.12 acres (150 Beds)
Hotel (2)			4.75 acres (120 Rooms Per)
General Commercial	18.61 acres (245,000 sq ft)	6.39 acres (85,000 sq ft)	2.86 acres (38,000 sq ft)
Light Industrial	6.35 acres	6.17 acres	3.23 acres
Service Industrial	9.95 acres	10.52 acres	9.39 acres
Development Subtotal	**65.81 acres**	**28.39 acres**	**23.35 acres**

Although design details are not yet available for office, surgery center, hotels, and general commercial and industrial development, the Project applicant has committed to the following, which are pertinent to the evaluation of the Project water usage:

- The Project's on-site circulation improvements will include interior roadways/ driveways that would provide access to the hotels, medical facilities, and destination-recreation uses from Hageman Road, Mohawk Street, and Knudsen/Landco Drive.
- Parking for the Project will be provided on a combination of paved surface-parking lots and/or parking structures, if necessary.
- The Project will be constructed in full compliance with state laws regarding water (and energy) conservation, including Title 24 as well as Executive Orders regarding drought conditions. Vegetation, trees, and structures will be used to create shaded walkways and shelters.
- Within the commercial village and recreational areas, the Project will incorporate design features to create a walkable urban environment by utilizing combinations of landscape, architecture, pedestrian pass-ways, gardens, plazas, and street plantings. Water quality facilities and design features will be integrated into the Project design, filtering drainage along landscaped bioswales and within landscape corridors, street parkways, medians, paseos, gardens, the golf driving range, and perimeter plantings.
- All landscaped areas will have a water-conserving irrigation system and will incorporate native vegetation and drought-tolerant plants. Street trees appropriate to the location will be planted in public rights-of-way in accordance with City ordinances and standards for both street landscaping and parking lot shading.

The water park is proposed to encompass approximately 26 acres, including 322 parking spaces, a wave pool, a lazy river, three slide towers, multiple children's and spray areas, associated mechanical facilities, and administrative, locker, restroom, and concession facilities. Approximately six acres of the 26-acre site are proposed to be set aside for the additional slides at a later date; this area would be landscaped and utilized for stormwater retention during the first phase.

The water park is proposed to operate between the hours of 10:00 a.m. and 8:00 p.m. (natural light permitting) seasonally; other than lighting for after-hours maintenance and security, permanent lighting sufficient to permit the operation of the park after dark is not proposed.

Parking is proposed via paid public parking for the water park. The primary rationale for controlled paid parking includes education and enforcement of water park policies and prevention of negative activities such as loitering to better facilitate a safe and positive entertainment experience for park patrons.

Based upon parking demand at similar parks, a total of 322 parking spaces to serve the first phase of development would be sufficient to accommodate the estimated 1,900 to 2,100 daily guests and the 35 to 40 park staff on-site during a typical shift. A drop-off area adjacent to the water park entrance is proposed; vehicles entering the parking lot to drop off patrons will be issued a temporary pass and will not be charged a parking fee, regardless of the number of occupants.

The applicants propose, and it has been assumed, that the City will require the water park to fully recycle and chlorinate all water used for park operations and maintenance, including splash and washdown.

Additional recreational and entertainment uses are proposed as accessory and incidental to the water park. These uses include outdoor concerts, business events, weddings, bridal showers, etc. It is proposed that the water park could be rented out for such private events during non-peak season hours. As these uses would occur during non-business hours, no additional parking would be required. It is anticipated that these events would be limited to a total of 10 to 15 per year. Additionally, on Independence Day, it is proposed that the park remain open until 10:00 p.m., and patrons would be treated to a professional-style fireworks show, similar to the Riverwalk Park, Bakersfield College, or various private country clubs around town.

1.3 - Estimated Water Usage

Although the Project's 152 total acres are proposed to be developed in phases, water usage is estimated for the total Project implementation.

Table 1-2
Water Usage

	Project Component	Description	Annual Usage, Acre-Feet/Year
1	Water Park	26.50 acres	96
2	Golf Range	4.40 acres	27
3	Medical Offices	5.31 acres; 37,000 sq. ft. of buildings	23
4	Surgery Center	3.12 acres; 150 beds	37
5	Two Hotels	4.75 acres; 240 rooms	16
6	General Commercial	27.86 acres (368,000 sq. ft. of buildings)	14
7	Light Industrial	15.75 acres	7
8	Service Industrial	29.86 acres	14
	Total Project		**234**

The basis for the estimated water usage for each component is:

1. For preliminary sizing, potable water demand for the proposed outdoor water park in Bakersfield is estimated at approximately 120 gal/guest day on a peak summer day. This includes domestic use, attraction make-up (evaporation, splash-out, and backwash), and on-site irrigation, and is consistent with published water-park consumption data and Central Valley climate conditions. This water demand estimate is the Aquatic Facility Operator (AFO) Manual, 8th edition, and the Green Lodging News website (greenlodgingnews.com) (Appendix C).

   With a 'season' of up to four months per year, the "filling" of a typical water park requires from 700,000 to 1,000,000 gallons (up to 3 acre-feet). Estimates of daily usage at peak capacity of 2,100 visitors would be 252,000 gal/day. With an estimated 120 operating days per year, the maximum water demand from guests would be 30.24 MGY. That usage, with an annual Project "refill" of 1 MGY (3 acre-feet), totals 96 acre-feet (30,240,000 gallons) per year. The water park usage estimate assumes paved, not turf, parking, and water usage recycling.

   (In comparison, the development of 20 acres for single-family usage, 80 dwelling units at 3.2 persons per dwelling unit, would require 64,000 gallons per day at 250 gallons per capita, 70 acre-feet per year.)

   A total demand of 96 acre-feet per year has been assumed.

2. A golf range occupying 4.4 acres would probably accommodate a maximum of 16 tees and thus require parking for no more than 20 vehicles. Parking for such vehicles, and

a small 'golf shack,' would require approximately .4 acres of hardscape, leaving 4.0 acres to be irrigated.

The yearly net evapotranspiration rate for the Bakersfield area is 60.81 inches/year. This translates to 6.7 acre-feet per year of irrigation demand. Using a maximum of 6.7 acre-feet of water per acre, annual usage of 27 acre-feet, including restroom and drinking fountain usage, would not be exceeded.

3. Assuming a moderate-intensity medical office complex (5.31 acres of building on a 10-acre site) and high-quality landscaping, indoor water usage would be in the order of (23.40 gal/sq.ft./year x 5.31 acres x 43,560 sq.ft./acre) 5.41 MGY (16.6 acre-feet per year, and landscaping usage for approximately 1 acre at 6.7 acre-feet per acre. A total of 23.3 acre-feet per year. The indoor water usage estimate is from the March 2024 WaterSense at Work document published by the US EPA. (Appendix B)

4. With a surgery center of 150 beds, it is assumed that moderate intensity office facility land use intensities will be duplicated. Such intensity, on (6 x .4), 2.4 acres would amount to an allowance of 700 square feet of building per bed, including surgery rooms, waiting rooms, reception and clerical space, surgery preparation areas, pharmaceutical and equipment storage, and surgeons' office space.

   With more limited parking demands for ambulatory surgeries than for medical offices, it is assumed that a surgery building area of (907 square feet x 150 beds, 136,000 square feet, 3.12 acres) would require only about 1 ½ acres (225 parking spaces) of parking and access, leaving about 2 acres of landscaping to be irrigated on the proposed 6-acre site.

   Indoor water usage would be approximately (55.71 gal/sq.ft./year x 3.12 acres x 43,560 sq.ft./acre) 7.6 MGY (23.2 acre-feet per year), and outdoor demand (2 acres x 6.7 acre-feet per acre) 13.4 acre-feet, approximately 36.6 acre-feet total. The indoor water usage estimate is from the March 2024 WaterSense at Work document published by the US EPA. (Appendix B).

5. The proposed two 120-roo hotels on 4.75 acres of Project site are estimated to have an average hotel (motel) size of about 50,000 square feet each. Water usage would be approximately (52.02 gal/sq.ft./year x 50,000 sq.ft. x 2 hotels) 5.2 MGY (16.3 acre-feet per year). The indoor water usage estimate is from the March 2024 WaterSense at Work document published by the US EPA. (Appendix B).

6. General commercial facilities, presumably a community shopping center or its equivalent, have been estimated[1] to occupy 30% of their allotted site, hardscaping (parking and access, 65% of that site, and landscaping only 5%).

   With 368,000 square feet of building and a water demand of 160 gpd/1000 sq ft of leasable area (American Water Works Association (AWWA) Manual M-22), foot per acre usage, in-building usage would be (36,800 sq ft x 160 gpd/1000 sq ft x 280

operational days/year) = 1.65 MGY (5 acre-feet). With 5% landscaping and 6.7 acre-feet per acre demand, landscaping usage would be (6.7 x 27.9 x .05) 9.3 acre-feet. With this usage estimation method, total water usage would be 14.3 acre-feet.

7. General light industrial facilities are assumed to encompass 15.75 acres; the total water usage of the light industrial facilities would be, at 7.2 acre-feet (2.35 MGY) [3.43 gal/sq.ft./year x 15.75 acres x 43,560 sq.ft./acre]. The water usage estimate is from the March 2024 WaterSense at Work document published by the US EPA. (Appendix B).

8. General service commercial facilities are assumed to be 29.86 acres; the total water usage of the light industrial facilities would be, at 13.7 acre-feet (4.46 MGY) [3.43 gal/sq.ft./year x 29.86 acres x 43,560 sq.ft./acre]. The water usage estimate is from the March 2024 WaterSense at Work document published by the US EPA. (Appendix B).

9. Conclusion: The calculated total water usage of the fully developed Project, as described, is 234 acre-feet annually.

SECTION 2 - WATER RESOURCES/WATER SUPPLY

2.1 - Proposed Water Supply

Following initial contact with the City of Bakersfield's Water Resources Department, it has been determined that, subject to Department requirements, the Project can be served by the City's domestic water system. (It is located within the City's designated service area; it abuts a California Water Service Company (CWS) service area.)

The Department has noted that probable Project water service requirements include:

- The likely need for on-street distribution system pipelines (Mohawk Street, Hageman Road, extension of Kress Road; see Figure 2-1).
- A wellsite, to permit supplementation of supply from City wells east of the site, and a possible storage tank.
- Preliminary test well evidence of site availability of quality-compliant, or wellhead-treatable, groundwater.

It is likely, given the Project location, that should it be determined during the Project approval process that the Project cannot be feasibly served by the City's domestic supply and distribution system, alternate water services could, probably with similar infrastructure requirements, be obtained from CWS with City approval of service area modifications.

2.2 - The Groundwater Basin and Subbasin

A major component of the proposed water supply will be groundwater. The status and capabilities of the groundwater resource must be considered.

The DWR-designated San Joaquin Valley Basin and Kern County Subbasin lie within the State's Tulare Lake Hydrologic Region (HR) (Figures 2-2 and 2-3).

The Tulare Lake HR covers approximately 10.0 million acres (17,000 square miles) and includes all of Kings and Tulare Counties and most of Fresno and Kern Counties. Significant geographic features include the southern half of the San Joaquin Valley between the Temblor Range to the west, the Tehachapi Mountains to the south, and the southern Sierra Nevada to the east. Major population centers include Fresno, Bakersfield, and Visalia.

Groundwater has historically been important to both urban and agricultural uses in the Region, accounting for 41% of the region's total annual supply and 35% of all groundwater use in the State. Groundwater use in the region represents about 10% of the state's overall water supply for agricultural and urban uses (DWR 1998).

Within the Region, the City of Bakersfield is located above a series of water-bearing aquifers. These water aquifers are part of the larger groundwater basin called the Southern San Joaquin Valley Groundwater Basin. The San Joaquin Valley Groundwater Basin is bounded

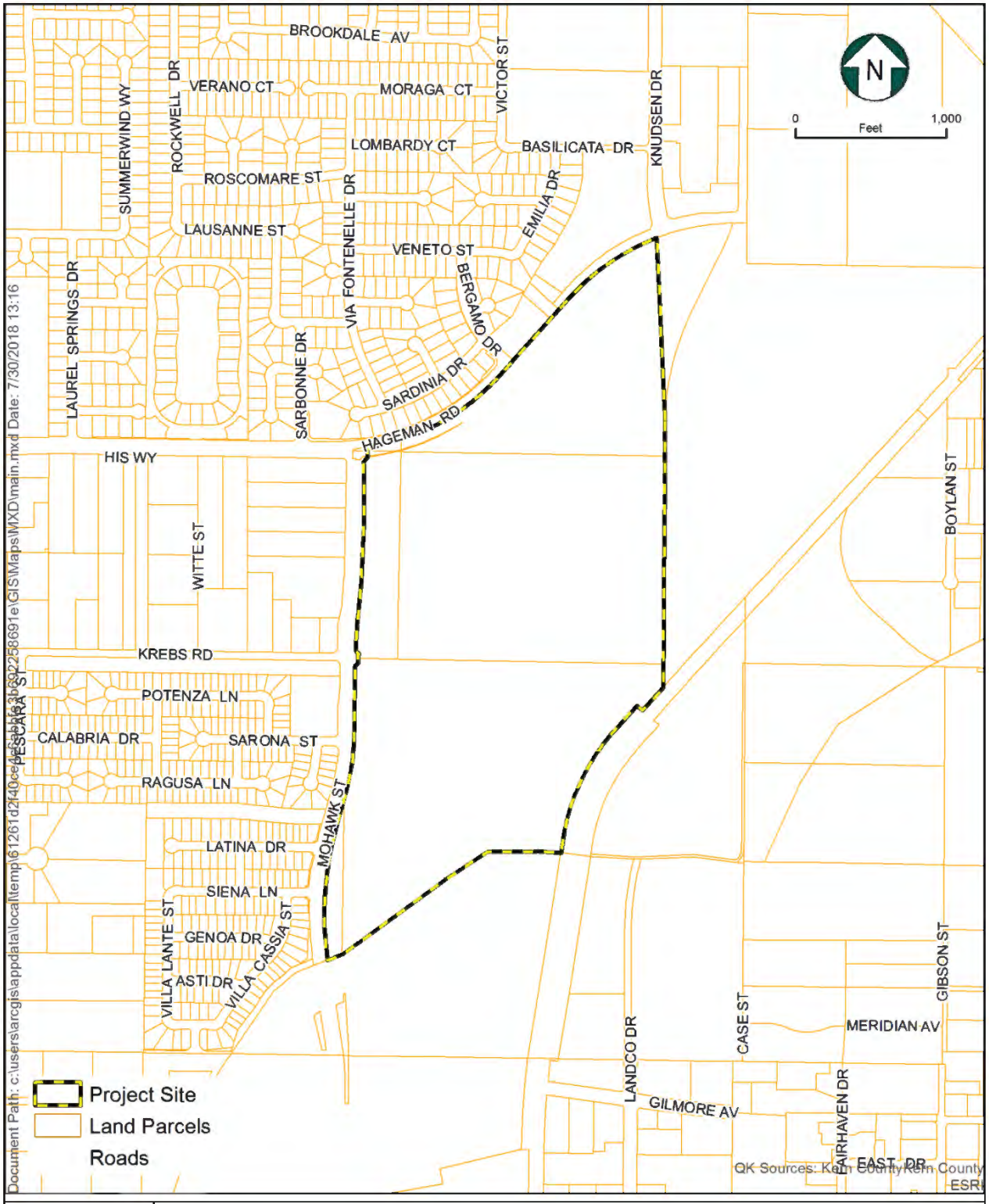


Figure 2-1
Adjacent Major Streets

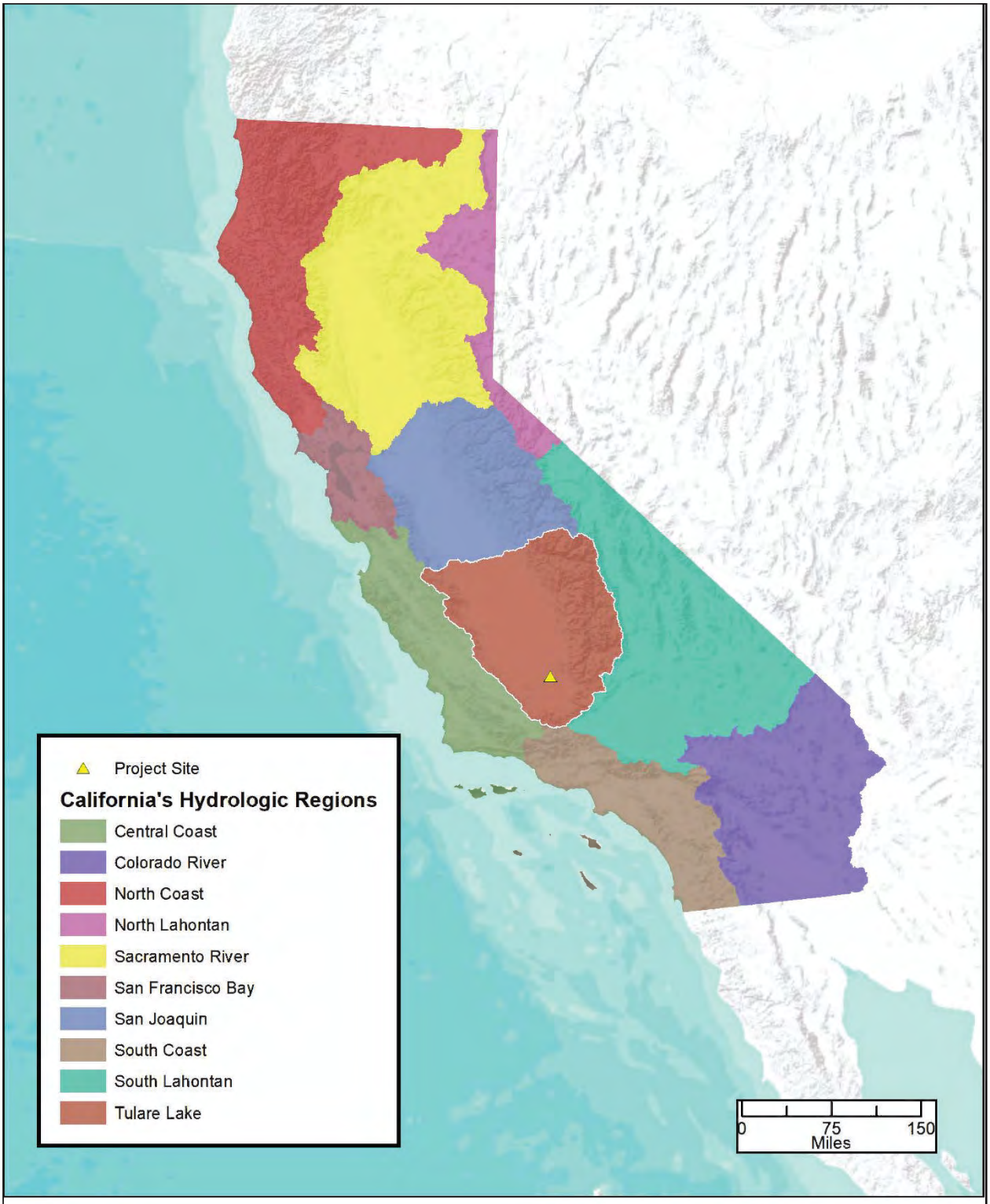


Figure 2-2
Tulare Lake Hydrologic Region

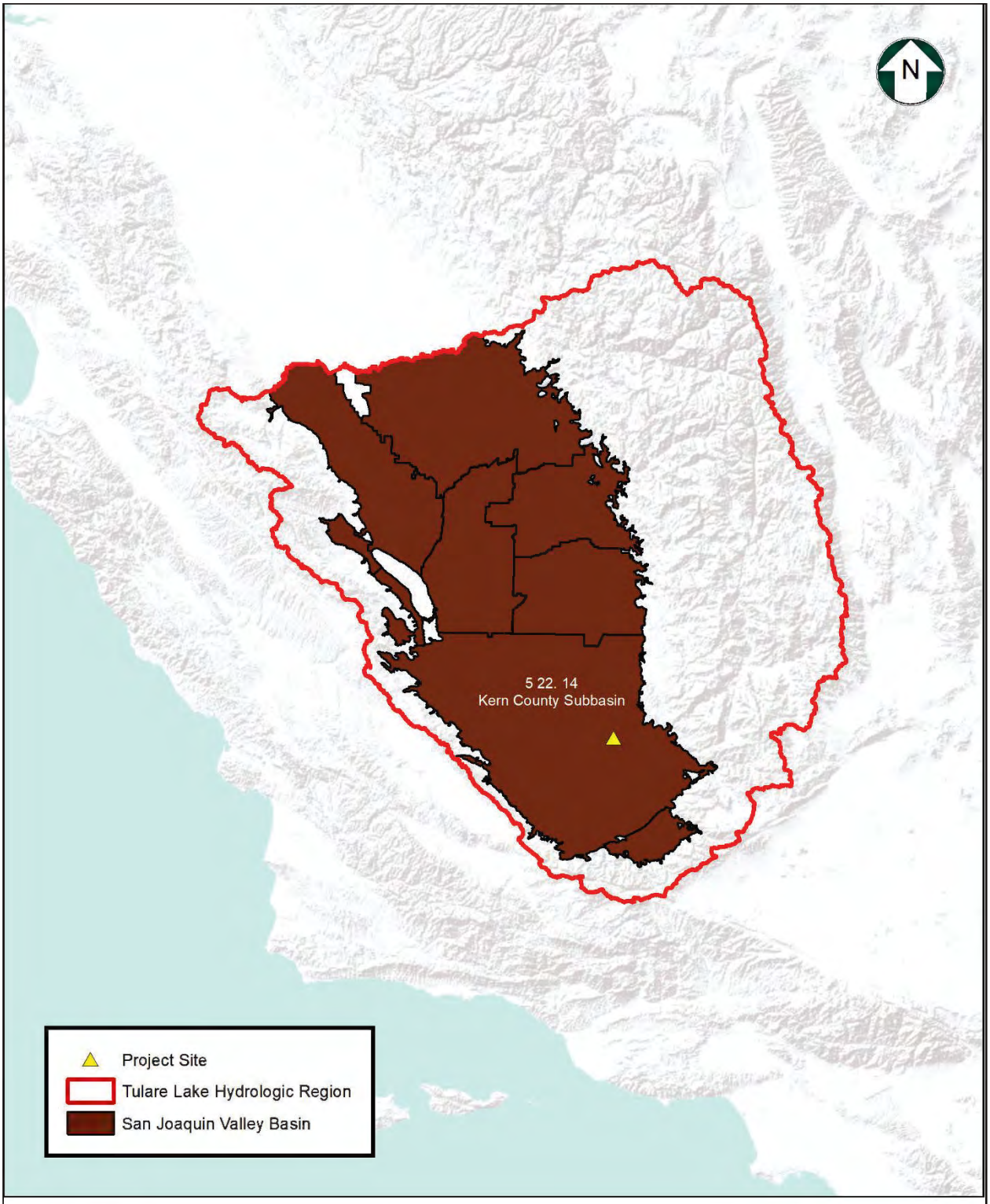


Figure 2-3
Kern County Subbasin

on the north by the Kern County line, on the east by the Sierra Nevada, on the west by the Coast Ranges, and on the south by the San Emigdio and Tehachapi Mountains. The Kern River is the surface water feature that divides this area. The groundwater aquifers within the Basin are thick and are made up of unconsolidated sediments. These sediments are bordered by faults and mountain ridges and serve as effective barriers for groundwater movement. Due to the thickness of the sediment in the Basin, many groundwater wells exceed 1,000 feet in depth.

The City is, within the Basin, located in the Kern County Subbasin. The Subbasin is 1,950,000 acres in extent. It is this Subbasin for which detailed groundwater and surface water data are available and utilized in the Urban Water Master Plan for the Bakersfield community, and for which the State-required Sustainable Groundwater Master Plan will be prepared. The Subbasin has been designated by the State as overdrafted and is therefore designated as "medium or high priority."

2.3 - The Surface Water Supplies

The City of Bakersfield and California Water Service Company's District serving a portion of the City receive surface water from two sources: the State Water Project and the Kern River.

The City's domestic water system and California Water Service Company's treatment and distribution facilities receive treated State Water Project water from an intermediary source, Kern County Water Agency's Improvement District No. 4 (ID4), which has a water supply from the State Water Project. A portion of the delivered water is treated by ID4. It is projected to receive about 6,500 acre-feet per year through 2040.

The City's wholesale water system water supply source is surface water from the Kern River. The City's Kern River surface water rights are pre-1914 appropriative water rights. On average, the City's Kern River water rights can supply about 116,000 acre-feet per year (based on the average year Kern River water yield from 2020).

SECTION 3 - THE WATER SUPPLY AGENCIES

There are two major water supply agencies serving urban Bakersfield, utilizing both local groundwater and surface water resources: the City of Bakersfield and California Water Service Company. The agencies and their service areas are:

3.1 - The City of Bakersfield

The City's Water Resources Department operates both a wholesale water system and a domestic water system.

The wholesale water system, with Kern River rights of 135,000 acre-feet per year. It wholesales a portion of its surface water entitlement to California Water Service Company for treatment and to other water entities and recharges the balance.

The domestic water system serves a population exceeding 150,000. It primarily relies on pumped groundwater, supplemented by treated surface water from California Water Service Company facilities and Kern County Water Agency's Improvement District No. 4 (ID4). The domestic water system is maintained and operated under contract by California Water Service Company.

3.2 - The California Water Service Company (CWS)

The Bakersfield District of CWS serves approximately 286,300 people with (in 2020) 59,418 acre-feet of water annually, significantly reduced from the pre-drought demand of about 75,000 acre-feet. Its water sources (2016-2020) were 49% groundwater and 51% surface water (from Bakersfield/Kern River and ID4). It operates four surface water treatment plants and operates and maintains not only the CWS distribution system but also the City's.

3.3 - The Agencies' Service Areas

The City's service area is depicted on Figure 3-1; CWS Bakersfield's service area is depicted on Figure 3-2.

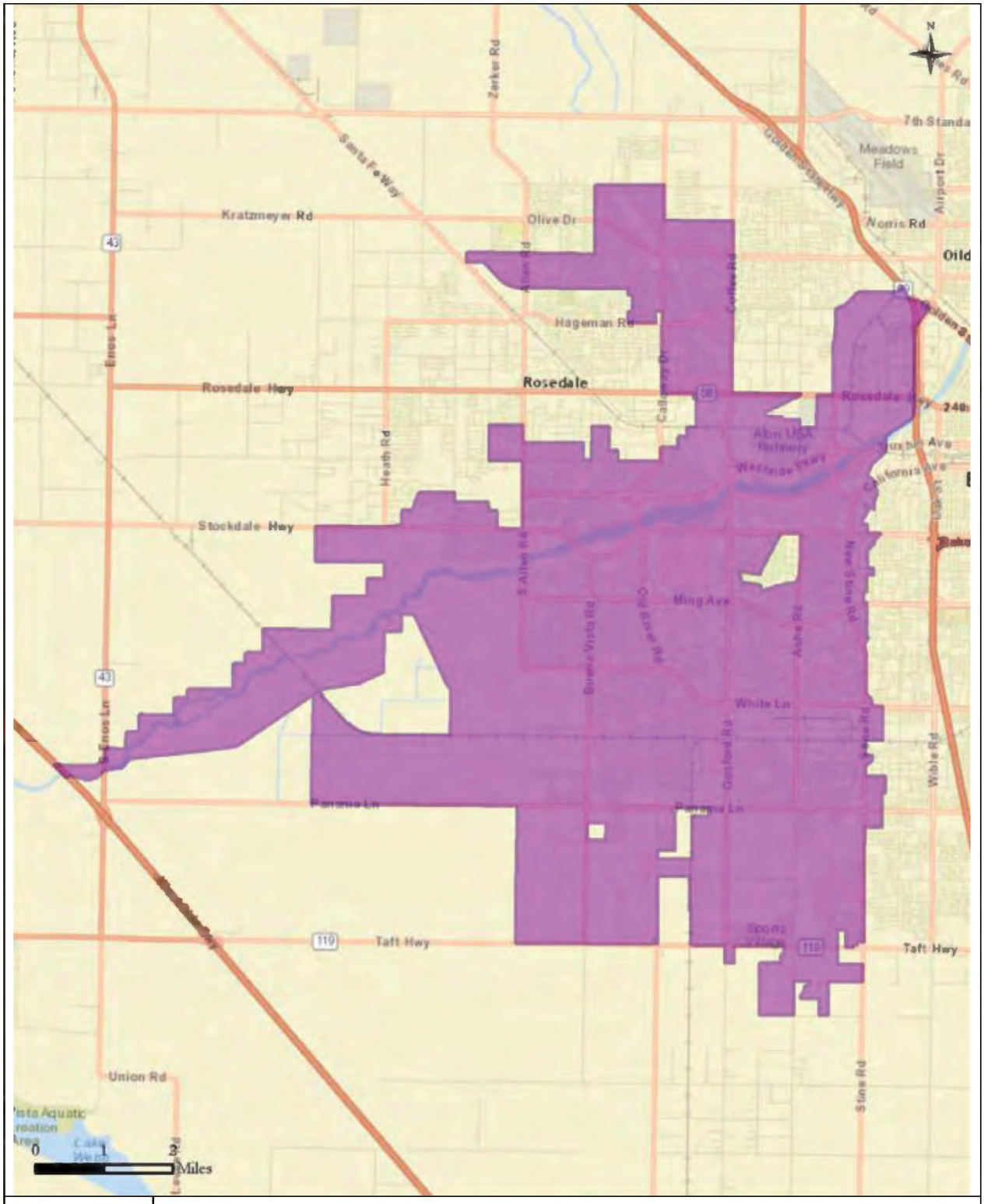


Figure 3-1
Bakersfield Domestic Water System Service Area

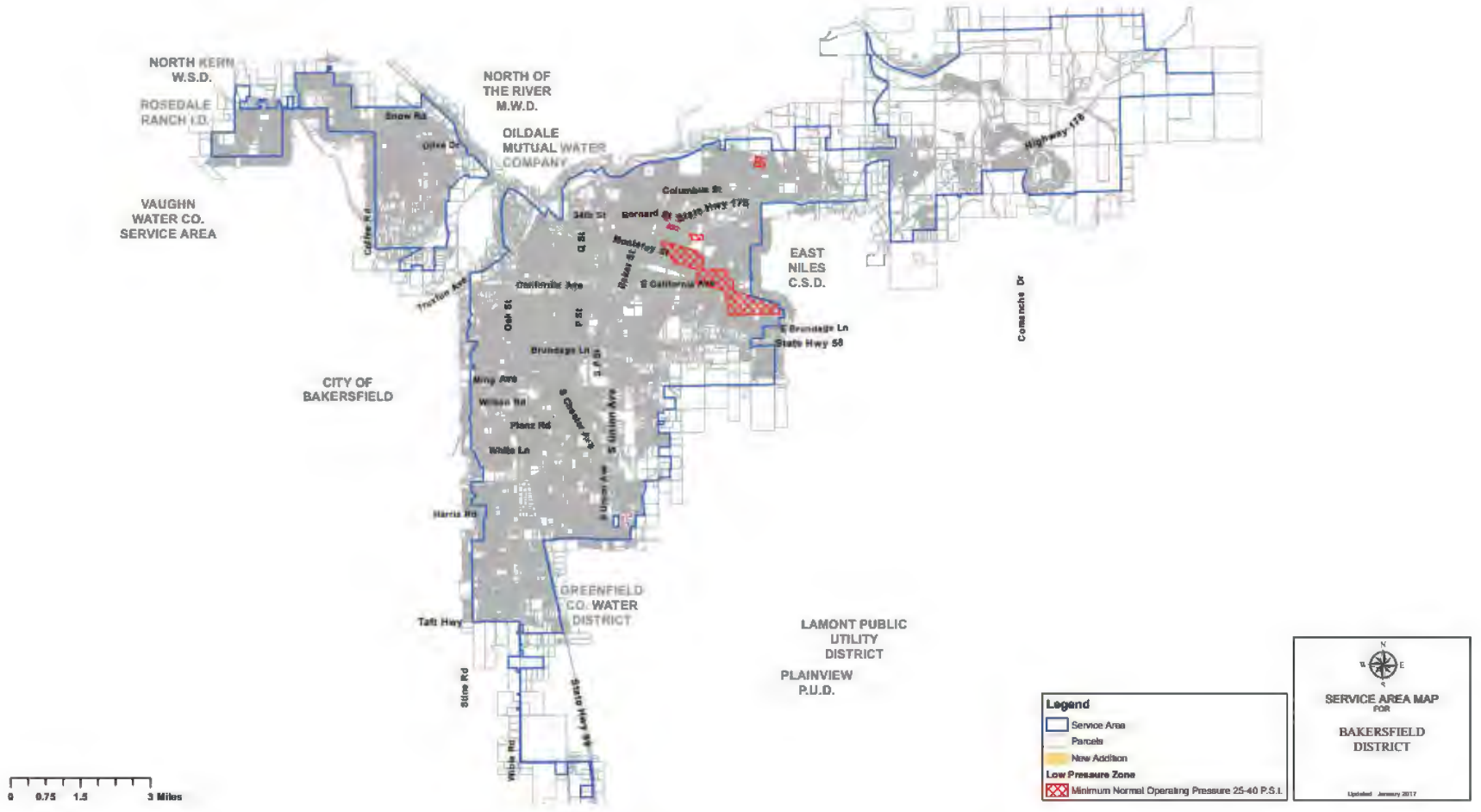


Figure 3-2
Cal Water Bakersfield Service Area

SECTION 4 - THE URBAN WATER MASTER PLANS (UWMPS)

The Water Supply Assessment can rely on the two plans to evaluate the total community water supply adequacy, as the two preparing agencies serve the majority of the total Bakersfield urban area.

4.1 - The City UWMP

The City 2020 UWMP (Appendix E) evaluates both its surface water supplies, as a wholesale water provider, and its domestic water system supply.

The City's surface water supply, the Kern River water rights, and State Water Project allotments through KCWA's ID4, both buttress the groundwater supply for the City's domestic water system (and CWS's treatment and distribution system) and permit wet year recharge to the Kern County Subbasin aquifers.

The City's domestic water system has historically provided an adequate and reliable groundwater supply in all climate years, including multiple dry years. This historic adequacy is documented in the UWMP. Based on that documentation and on projected supply availability, the UWMP has projected 20-year system supply reliability in the following tables.

Table 4-1
Domestic: Normal Year Supply and Demand Comparison (City)

	2025	2030	2035	2040
Supply totals	52,430	63,834	68,952	74,550
Demand totals	52,430	63,834	68,952	74,550
Difference	0	0	0	0

Table 4-2
Wholesale: Normal Year Supply and Demand Comparison (City)

	2025	2030	2035	2040
Supply totals	100,000	100,000	100,000	100,000
Demand totals	100,000	100,000	100,000	100,000
Difference	0	0	0	0

Table 4-3
Domestic: Single Dry Year Supply and Demand Comparison (City)

	2025	2030	2035	2040
Supply totals	50,190	54,873	59,991	65,589
Demand totals	50,190	54,873	59,991	65,589
Difference	0	0	0	0

Table 4-4
Wholesale: Single Dry Year Supply and Demand Comparison (City)

	2025	2030	2035	2040
Supply totals	14,079	14,079	14,079	14,079
Demand totals	100,000	100,000	100,000	100,000
Difference	(85.921)	(85.921)	(85.921)	(85.921)

Table 4-5
Domestic: Multiple Dry Years Supply and Demand Comparison (City)

		2025	2030	2035	2040
First Year	Supply totals	50,190	54,873	59,991	65,589
	Demand totals	50,190	54,873	59,991	65,589
	Difference	0	0	0	0
Second Year	Supply totals	45,171	49,386	53,992	59,030
	Demand totals	45,171	49,386	53,992	59,030
	Difference	0	0	0	0
Fifth year	Supply totals	42,662	46,642	50,992	55,751
	Demand totals	42,662	46,642	50,992	55,751
	Difference	0	0	0	0

Table 4-6
Wholesale: Multiple Dry Years Supply and Demand Comparison (City)

		2025	2030	2035	2040
First Year	Supply totals	32,092	32,092	32,092	32,092
	Demand totals	100,000	100,000	100,000	100,000
	Difference	(67,908)	(67,908)	(67,908)	(67,908)
Second Year	Supply totals	22,245	22,245	22,245	22,245
	Demand totals	100,000	100,000	100,000	100,000
	Difference	(77,755)	(77,755)	(77,755)	(77,755)
Fifth year	Supply totals	32,001	32,001	32,001	32,001
	Demand totals	100,000	100,000	100,000	100,000
	Difference	(67,999)	(67,999)	(67,999)	(67,999)

The City's UWMP has concluded:

"The water supplies for the Domestic Water System are projected to be adequate to meet demands during the years of the Drought Risk Assessment. The City's Kern River supplies have been replenished to the groundwater basin and provide reliability of groundwater supplies for a five-year drought. When SWP supplies are not available from KCWA's ID4, the City is able to deliver its Kern River water to KCWA's ID4 for treatment in place of SWP supplies."

4.2 - The California Water Service Company (CWS), Bakersfield District UWMP

Groundwater serves as the primary supply to the CWS Bakersfield district. Primary sources of recharge are from the Kern River, irrigation canals that radiate away from the River, and artificial recharge with imported water supplies at groundwater banking facilities. Since the Kern River is the primary source of recharge to aquifers, groundwater flow occurs in a radial pattern away from the River. Groundwater contaminants are treated at wellheads to ensure quality compliance.

Surface water is a backup supply source.

Based on the 2020 UWMP (Appendix E), the primary source of surface water comes, by contract with the City, from the City's Kern River water rights. Surface water supplies from the Kern River are treated in a 20 million-gallon daily (MGD) design flow microfiltration plant in northeast Bakersfield and an eight MGD design flow microfiltration plant in the northwest. Additionally, Kern County Water Agency (KCWA) operates a plant that treats surface water from the Kern River, State Water Project, and local groundwater.

Historic average annual rainfall from 1980 to 2019 was 6.55 inches. A normal hydrologic year occurred in 2017 when precipitation was approximately 4.6% above the historic average (Table 4-7). The driest year occurred in 2008, when the rainfall was approximately 54% below average (3.04 inches) (Table 4-8); this is taken as the single dry year. The multiple dry-water years used are 2011 through 2015 (Table 4-9).

Table 4-7
Retail: Normal Year Supply and Demand Comparison (AF) (CWS)

	2025	2030	2035	2040
Supply totals	60,439	62,681	65,408	67,871
Demand totals	60,439	62,681	65,408	67,871
Difference	0	0	0	0

Table 4-8
Retail: Single Dry Year Supply and Demand Comparison (AF) (CWS)

	2025	2030	2035	2040
Supply totals	61,520	63,807	66,588	69,100
Demand totals	61,520	63,807	66,588	69,100
Difference	0	0	0	0

Table 4-9
Retail: Multiple Dry Years Supply and Demand Comparison (AF) (CWS)

		2025	2030	2035	2040
First Year	Supply totals	62,188	64,504	67,318	69,860
	Demand totals	62,188	64,504	67,318	69,860
	Difference	0	0	0	0
Second Year	Supply totals	62,188	64,504	67,318	69,860
	Demand totals	62,188	64,504	67,318	69,860
	Difference	0	0	0	0
Fifth year	Supply totals	62,188	64,504	67,318	69,860
	Demand totals	62,188	64,504	67,318	69,860
	Difference	0	0	0	0

The UWMP has concluded:

"Based on available historical information and projections of future water uses, regulatory and legal constraints, and hydrological and environmental conditions, including climate change, Cal Water has made its best determination of the future reliability of the Bakersfield District's water supplies.

At this point, the combined District groundwater and purchased supplies are projected to be sufficient to meet future demands under all hydrologic conditions. However, water quality and climate change are concerns that must be closely monitored and addressed."

It is evident, in reviewing UWMP data and its water supply reliability conclusion, that the contracted availability of Kern River surface water from the City of Bakersfield's Water Resource Division is critical in support of this conclusion.

SECTION 5 - THE PROPOSED WATER SUPPLY AGENCY

The City of Bakersfield is both a wholesaler and retailer of water in the City of Bakersfield area. The City purchased Kern River water rights, land, and the physical water distribution systems of the Ashe Domestic Water Service Area, which has grown to become the City's domestic water service area, from Tenneco West (Tenneco). California Water Service Company (CWS) is under contract to operate and maintain the City's domestic water service system. The City wholesales a portion of its Kern River water to two CWS treatment facilities and other various water entities. The City's Water Resources Department manages both the domestic retail water operation and the wholesale water operation.

A portion of the urban water demand within the city limits is satisfied through the City's Kern River deliveries to water treatment plants owned and operated by CWS. CWS serves portions of the City and unincorporated areas in Kern County and provides water primarily to single-family residences.

The City's domestic water system serves retail customers within its service area. The City's domestic water system provides water primarily for residential uses and also for business, commercial, industrial, and public customers in and adjacent to the westerly portion of the City. The City Water Resources Department operates the Kern River channel, weirs, headgates, turnouts and canals through the City of Bakersfield, as well as 1,470 acres of groundwater recharge ponds along the Kern River.

The City's domestic water system service area had a 2015 population of about 146,500. Table 5-1 shows the City-estimated projected population of the area to be served by the City's domestic water system from 2020 to 2040.

Table 5-1
City Domestic Water System Population Projection

Population	2020	2025	2030	2035	2040
Served	161,980	177,090	193,610	211,670	231,420

It should be noted that California Water Service Company serves, and is projected to serve, a significant additional population in the Bakersfield urban area, as estimated in their 2020 UWMP.

Table 5-2
California Water Service Area Population Projections

Population	2020	2025	2030	2035	2040	2045
Served	286,310	299,366	314,753	329,207	342,878	356,039

The City supplies, and presumably will continue to supply, a significant component of the Kern River-derived water supply required to sustain the projected CWS domestic distribution system's projected population growth.

SECTION 6 - WATER SUPPLY SUFFICIENCY

The 2020 Urban Water Management Plans of both the City and California Water Service Company's Bakersfield District were utilized, together with State information regarding the Kern County Subbasin, in evaluating water supply sufficiency for the Project.

6.1 - Projected "Water Years" Supply Adequacy

The normal year, dry year, and multiple dry year water demand/water supply projections excerpted from the two agencies' Urban Water Management Plans appear to be based on adequate data and analysis. The conclusions drawn by each agency that their projected demand can be reliably supplied can be relied upon for this Project's water supply evaluation (Section 4).

6.2 - Infrastructure Sufficiency

Implementation of the tentative Project approval requirements outlined by the City Department of Water Resources (Subsection 2.1) would ensure that adequate infrastructure (supply, storage, distribution) will be available for the Project. Project adjacency to extensive urban development served by California Water Service Company would permit a similar evaluation and implementation.

6.3 - The Kern County Basin Groundwater Sustainability Plan

At this time, the Plan does not require implementation of any conditions or measures that would invalidate current conclusions regarding water supply adequacy for the Project. The City of Bakersfield is a major contributor to subbasin groundwater sustainability with its groundwater recharge program for Kern River surface water.

SECTION 7 - CONCLUSIONS

Based upon the Project description, its projected water usage, City/California Water Service analyses of normal year, dry year, and multiple dry year water demand and supply, and infrastructure availability and requirements, it is concluded that the proposed water supply for the Project will be, in all climate years, sufficient to meet Project water demands.

The Project Water Supply Assessment, in providing data and analysis that support this conclusion, is consistent with the Department of Water Resources' Guidelines.

SECTION 8 - REFERENCES

- California Water Service, 2020 Urban Water Management Plan, Bakersfield District, June 2021

- City of Bakersfield, 2020 Urban Water Management Plan, December 2021

- 2004. California's Groundwater Bulletin 118. Hydrologic Region, San Joaquin Valley Groundwater Basin. (online): http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/6-44.pdf. Accessed October 20, 2018

- 2003. Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001. (online): http://www.water.ca.gov/pubs/use/sb_610_sb_221_guidebook/guidebook.pdf. Accessed October 20, 2018

- Zoning Ordinance, City of Bakersfield; Bakersfield Municipal Code – Title 17, Section 17.58, Parking and Loading Standards and 17.61, Landscape Standards

- Kern Groundwater Authority, 2022 Amended, Groundwater Sustainability Plan

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APPENDIX A
CHAPTER 643, STATUTES OF 2001 (SENATE BILL 610)

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Chapter 643, Statutes of 2001 (Senate Bill 610)

An act to amend Section 21151.9 of the Public Resources Code, and to amend Sections 10631, 10656, 10910, 10911, 10912, and 10915 of, to repeal Section 10913 of, and to add and repeal Section 10657 of, the Water Code, relating to water. Approved by Governor October 9, 2001. Filed with Secretary of State October 9, 2001.

The people of the State of California do enact as follows:

SECTION 1. (a) The Legislature finds and declares all of the following:
(1) The length and severity of droughts in California cannot be predicted with any accuracy.

(2) There are various factors that affect the ability to ensure that adequate water supplies are available to meet all of California's water demands, now and in the future.

(3) Because of these factors, it is not possible to guarantee a permanent water supply for all water users in California in the amounts requested.

(4) Therefore, it is critical that California's water agencies carefully assess the reliability of their water supply and delivery systems.

(5) Furthermore, California's overall water delivery system has become less reliable over the last 20 years because demand for water has continued to grow while new supplies have not been developed in amounts sufficient to meet the increased demand.

(6) There are a variety of measures for developing new water supplies including water reclamation, water conservation, conjunctive use, water transfers, seawater desalination, and surface water and groundwater storage.

(7) With increasing frequency, California's water agencies are required to impose water rationing on their residential and business customers during this state's frequent and severe periods of drought.

(8) The identification and development of water supplies needed during multiple-year droughts is vital to California's business climate, as well as to the health of the agricultural industry, environment, rural communities, and residents who continue to face the possibility of severe water cutbacks during water shortage periods.

(9) A recent study indicates that the water supply and land use planning linkage, established by Part 2.10 (commencing with Section 10910) of Division 6 of the Water Code, has not been implemented in a manner that ensures the appropriate level of communication between water agencies and planning agencies, and this act is intended to remedy that deficiency in communication.

(b) It is the intent of the Legislature to strengthen the process pursuant to which local agencies determine the adequacy of existing and planned future water supplies to meet existing and planned future demands on those water supplies.

SEC. 2. Section 21151.9 of the Public Resources Code is amended to read:
21151.9. Whenever a city or county determines that a project, as defined in Section 10912 of the Water Code, is subject to this division, it shall comply with Part 2.10 (commencing with Section 10910) of Division 6 of the Water Code.

SEC. 3. Section 10631 of the Water Code is amended to read:
10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be

based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments as described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the location, amount, and sufficiency of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.
(2) A single dry water year.
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments as described in subdivision (a). (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.
(B) Residential plumbing retrofit.
(C) System water audits, leak detection, and repair.
(D) Metering with commodity rates for all new connections and retrofit of existing connections.
(E) Large landscape conservation programs and incentives.
(F) High-efficiency washing machine rebate programs.
(G) Public information programs.
(H) School education programs.
(I) Conservation programs for commercial, industrial, and institutional accounts.
(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of such savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and non-economic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single dry, and multiple dry water years. The description shall identify specific projects and include a description of the increase

in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

SEC. 3.5. Section 10631 of the Water Code is amended to read:
10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments as described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years. For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments as described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.
(B) Residential plumbing retrofit.
(C) System water audits, leak detection, and repair.
(D) Metering with commodity rates for all new connections and retrofit of existing connections.
(E) Large landscape conservation programs and incentives.
(F) High-efficiency washing machine rebate programs.
(G) Public information programs.
(H) School education programs.
(I) Conservation programs for commercial, industrial, and institutional accounts.
(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single dry, and multiple dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).
SEC. 4. Section 10656 of the Water Code is amended to read:
10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

SEC. 4.3. Section 10657 is added to the Water Code, to read:
10657. (a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

SEC. 4.5. Section 10910 of the Water Code is amended to read:
10910. (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined in Section 10912, that may supply water for the project. If the city or county is not able to identify any public water system that may supply water for the project, the city or county shall prepare the water assessment required by this part after consulting with any entity serving domestic water supplies whose service area includes the project site, the local agency formation commission, and any public water system adjacent to the project site.

(c) (1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

(d) (1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts.

(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

(A) Written contracts or other proof of entitlement to an identified water supply.

(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.

(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.

(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contract-holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.

(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water supply assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

(g) (1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.

(2) Prior to the expiration of the 90-day period, if the public water system intends to request an extension of time to prepare and adopt the assessment, the public water system shall meet with the city or county to request an extension of time, which shall not exceed 30 days, to prepare and adopt the assessment.

(3) If the public water system fails to request an extension of time, or fails to submit the assessment notwithstanding the extension of time granted pursuant to paragraph (2), the city or county may seek a writ of mandamus to compel the governing body of the public water system to comply with the requirements of this part relating to the submission of the water supply assessment.

(h) Notwithstanding any other provision of this part, if a project has been the subject of a water supply assessment that complies with the requirements of this part, no additional water supply assessment shall be required for subsequent projects that were part of a larger project for which a water supply assessment was completed and that has complied with the requirements of this part and for which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has concluded that its water supplies are sufficient to meet the projected water demand associated with the proposed project, in addition to the existing and planned future uses, including, but not limited to, agricultural and industrial uses, unless one or more of the following changes occurs:

(1) Changes in the project that result in a substantial increase in water demand for the project.

(2) Changes in the circumstances or conditions substantially affecting the ability of the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), to provide a sufficient supply of water for the project.

(3) Significant new information becomes available which was not known and could not have been known at the time when the assessment was prepared.

SEC. 5. Section 10911 of the Water Code is amended to read:
10911. (a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water supply assessment its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:

(1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.

(2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.

(3) Based on the considerations set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to be able to acquire additional water supplies.

(b) The city or county shall include the water supply assessment provided pursuant to Section 10910, and any information provided pursuant to subdivision (a), in any environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code.

(c) The city or county may include in any environmental document an evaluation of any information included in that environmental document provided pursuant to subdivision (b). The city or county shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses. If the city or county determines that water supplies will not be sufficient, the city or county shall include that determination in its findings for the project.

SEC. 6. Section 10912 of the Water Code is amended to read:
10912. For the purposes of this part, the following terms have the following meanings:

(a) "Project" means any of the following:

(1) A proposed residential development of more than 500 dwelling units.

(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

(4) A proposed hotel or motel, or both, having more than 500 rooms.

(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(6) A mixed-use project that includes one or more of the projects specified in this subdivision.

(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

(b) If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections.

(c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3000 or more service connections. A public water system includes all of the following:

(1) Any collection, treatment, storage, and distribution facility under control of the operator of the system which is used primarily in connection with the system.

(2) Any collection or pretreatment storage facility not under the control of the operator that is used primarily in connection with the system.

(3) Any person who treats water on behalf of one or more public water systems for the purpose of rendering it safe for human consumption.

SEC. 7. Section 10913 of the Water Code is repealed.

SEC. 8. Section 10915 of the Water Code is amended to read:
10915. The County of San Diego is deemed to comply with this part if the Office of Planning and Research determines that all of the following conditions have been met:

(a) Proposition C, as approved by the voters of the County of San Diego in November 1988, requires the development of a regional growth management plan and directs the establishment of a regional planning and growth management review board.

(b) The County of San Diego and the cities in the county, by agreement, designate the San Diego Association of Governments as that review board.

(c) A regional growth management strategy that provides for a comprehensive regional strategy and a coordinated economic development and growth management program has been developed pursuant to Proposition C.

(d) The regional growth management strategy includes a water element to coordinate planning for water that is consistent with the requirements of this part.

(e) The San Diego County Water Authority, by agreement with the San Diego Association of Governments in its capacity as the review board, uses the association's most recent regional growth forecasts for planning purposes and to implement the water element of the strategy.

(f) The procedures established by the review board for the development and approval of the regional growth management strategy, including the water element and any certification process established to ensure that a project is consistent with that element, comply with the requirements of this part.

(g) The environmental documents for a project located in the County of San Diego include information that accomplishes the same purposes as a water supply assessment that is prepared pursuant to Section 10910.

SEC. 9.
Section 3.5 of this bill incorporates amendments to Section 10631 of the Water Code proposed by both this bill and AB 901. It shall only become operative if (1) both bills are enacted and become effective on or before January 1, 2002, (2) each bill amends Section 10631 of the Water Code, and (3) this bill is enacted after AB 901, in which case Section 3 of this bill shall not become operative.

SEC. 10.
No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because a local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the program or level of service mandated by this act, within the meaning of Section 17556 of the Government Code.

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APPENDIX B
EPA WATERSENSE

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WaterSense at Work

Water Use Monitoring

2.3 Benchmarking





Best Management Practices for Commercial and Institutional Facilities

EPA WaterSense

March 2024

WaterSense® is a voluntary partnership program sponsored by the U.S. Environmental Protection Agency (EPA) that seeks to protect the nation's water supply by transforming the market for water-efficient products, services, and practices.

WaterSense at Work is a compilation of water efficiency best management practices intended to help commercial and institutional facility owners and managers from multiple sectors understand and better manage their water use. It provides guidance to help establish an effective facility water management program and identify projects and practices that can reduce facility water use.

An overview of the sections in *WaterSense at Work* is below. This document, covering benchmarking, is part of **Section 2: Water Use Monitoring**. The complete list of best management practices is available at www.epa.gov/watersense/best-management-practices. WaterSense has also developed worksheets to assist with water management planning and case studies that highlight successful water efficiency efforts of building owners and facility managers throughout the country, available at www.epa.gov/watersense/commercial-buildings.

- **Section 1. Getting Started With Water Management**
- **Section 2. Water Use Monitoring**
- **Section 3. Sanitary Fixtures and Equipment**
- **Section 4. Commercial Kitchen Equipment**
- **Section 5. Outdoor Water Use**
- **Section 6. Mechanical Systems**
- **Section 7. Laboratory and Medical Equipment**
- **Section 8. Onsite Alternative Water Sources**

EPA 832-F-23-003
Office of Water
U.S. Environmental Protection Agency
March 2024

This document is one section from *WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities* (EPA-832-F-23-003). Other sections can be downloaded from www.epa.gov/watersense/best-management-practices. Sections will be reviewed and periodically updated to reflect new information. The work was supported under contract 68HERC20D0026 with Eastern Research Group, Inc. (ERG).

Overview

Benchmarking water use in commercial and institutional facilities is a valuable water management tool that can generate useful information for facility owners and operators. While the term "benchmarking" can be defined in different ways, the U.S. Environmental Protection Agency (EPA) and its ENERGY STAR® program define it as the process of measuring a building's water use and comparing it to its own historical usage, the water use of similar facilities, or a reference performance level.[1,2] By this definition, benchmarking may include the simple measurement and self-comparison of a facility's water consumption over time (e.g., gallons per year). However, benchmarking can be made more powerful by normalizing a facility's water use, thus allowing for comparisons across similar facilities of the same type or function. Normalization can use a meaningful functional denominator (e.g., gallons per gross square foot per year), or involve a multifactor model. The 1-to-100 ENERGY STAR Score (for energy) and the EPA Water Score, described at right and below, are examples of multifactor ratings that can be generated by inputting facility information and utility usage data into ENERGY STAR Portfolio Manager® at www.energystar.gov/buildings/benchmark.

Resources for Multifamily Property Water Use Benchmarking

Property managers interested in benchmarking multifamily building water consumption should use the EPA Water Score. The EPA Water Score is a 1-to-100 rating, generated by entering building and water consumption data into ENERGY STAR Portfolio Manager, that helps compare multifamily building water use to similar properties nationwide. Information about the EPA Water Score, along with additional technical resources intended to help multifamily property owners conduct a property water assessment and identify opportunities to improve their Water Score by reducing water use, can be found at www.epa.gov/watersense/water-score-multifamily-housing.

Benchmarking requires the choice of both metrics and benchmarks. A metric (sometimes referred to as a performance indicator) is a unit of measure that can be used to assess the rate of water use.[3] Examples include water use per year, water use per capita per day, and

[1] U.S. Environmental Protection Agency (EPA). Energy Resources for State and Local Governments. Benchmarking and Building Performance Standards Policy Toolkit. www.epa.gov/statelocalenergy/benchmarking-and-building-performance-standards-policy-toolkit.
[2] ENERGY STAR Portfolio Manager. February 2021. *Benchmarking and Building Performance Standards Policy Toolkit. Section 1: Building Energy Benchmarking and Transparency: Overview for State and Local Decision Makers*. www.epa.gov/sites/default/files/2021-02/documents/benchmarking_building_performance_standards_section1.pdf.
[3] A&N Technical Services, Inc. March 1, 2013. *Analysis of Water Use Efficiency Metrics and Benchmarking*. Prepared for Mesa Water District. www.usbr.gov/lc/socal/reports/MesaWDBenchmarks.pdf.

water use per gross square foot per year. A benchmark is a particular numerical value of a metric that allows for the comparison of a facility to itself or to other buildings of similar function and operating characteristics.[4] As an example of a metric, a facility can collect its water use per year or water use per occupant per year. Collection and comparison of that water use metric over multiple years would constitute benchmarking.

There are many advantages to benchmarking commercial and institutional buildings for water use. Determining how a facility is performing compared to similar facilities can help facility managers prioritize which facilities or building systems to upgrade or justify increased attention on water efficiency goals. In addition, by characterizing how facilities use water and incorporating efficiency improvements, it is possible to offset rising water and sewer costs, improve resilience to water shortages, and potentially save energy (and associated energy costs).

How to Benchmark Your Facility

The following sections detail the basic steps to benchmark your facility or portfolio of facilities.

Track Water Use and Prepare for Benchmarking

If you are not already doing so, you should be collecting, reviewing, and recording bills for all water and wastewater sources onsite. A minimum of one year will help identify and understand seasonal trends, but three or more years is preferable. These records should include utility bills, as well as any self-supplied or alternative water sources (e.g., reclaimed water, water from on-property wells, harvested rainwater, onsite recycled water).

If utility bills are not readily available, facility managers can contact their utility to request copies of previous bills or install and monitor their own building-level water meters or other water monitoring devices in preparation for benchmarking. Submetering large subsystems may also be beneficial. Advanced metering systems may include analysis software or portals to monitor facility water use and possibly allow for comparison with other customers. Refer to *WaterSense at Work Section 2.2: Metering and Submetering* at www.epa.gov/watersense/best-management-practices for additional guidance.

Proper characterization of the facility to identify operating characteristics and factors that can influence water use is essential, because it limits comparisons to other properties with similar operating characteristics. Examples of facility information that may be important to understand include:

[4] *Ibid.*

- Building identifying information: This includes the location, year of construction, and year of major renovation (if applicable).
- Building areas, dimensions, and facility type: Water use characteristics can vary significantly based on the facility's principal use. Some examples of commercial and institutional building types include education, foodservice, healthcare, lodging, manufacturing, office, public assembly, retail, service, and warehouse. A single property may contain multiple facility types.
- Unique features that may impact water use: Some water-intensive operations include commercial kitchens, foodservice, medical facilities, laundry operations, cooling towers, irrigation systems, pools, and spas.
- Irrigated area: When irrigation is used, large landscapes tend to use more water than small ones.
- Number of operational days: Not all facilities are in use 365 days per year. For public schools, most U.S. states require 180 instructional days per year but might require additional professional days for faculty and staff. Commercial and office buildings might be in use between 250 and 260 days per year, accounting for weekends and the number of holidays recognized.
- Number of occupants: Accounting for the number of building occupants can sometimes prove complex. For certain facility types that employ people hourly, such as office buildings and retail, it is helpful to calculate the number of full-time equivalent (FTE) employees. While definitions vary, FTE can be calculated by dividing an employee's scheduled hours by the employer's hours for a full-time work week. Other examples include calculating the number of full-time students enrolled at a school, the number of patients served by a hospital, or the number of visitors/customers seen on an average day.

Refer to *WaterSense at Work Section 1.2 Water Management Planning* at www.epa.gov/watersense/best-management-practices for more information on tracking water use.

Select Appropriate Metrics

The choice of appropriate metrics is critical—particularly when comparing across facilities with similar operations—and varies depending on the facility type. The most widely reported metric is gallons of water used per square foot per year. ENERGY STAR Portfolio Manager refers to this as water use intensity (WUI). However, floor area may not be the best metric to understand water use. People, equipment, operations, and landscape area are all primary drivers of water use. While WUI serves as a common metric across most facility types in water benchmarking, metrics specific to the property that reflect the activity of the facility rather than its size are often preferable. Metrics could be:



- Functional metrics: These metrics are based on the intended purpose of the facility (e.g., water use per guest-night, water use per meal served, water use per pound of laundry).
- People metrics: These metrics are based on the number of people that interact with the facility (e.g., water use per employee, water use per customer, water use per student).
- Facility metrics: These metrics are based on the physical characteristics of the facility (e.g., water use per square foot, water use per seat, water use per dwelling unit).

The best choice of metric varies depending on the purpose of the facility. In addition, data availability and data consistency are important considerations in selecting metrics. If it is not possible to track the ideal metric due to data limitations, proxy metrics can be substituted. Some examples of appropriate metrics for various facility types are included in Table 1 on the next page.

The same water use data normalized by different functional denominators can often tell different stories. If the facility is looking to compare a metric with other facilities within your portfolio or elsewhere, try to match benchmarking metrics to ones commonly used in the industry so that direct comparisons can be made. Developing metrics and benchmarks based on several different denominators may be beneficial (e.g., gallons per day per occupied room AND gallons per day per total rooms). It is good practice to carefully describe how your denominators were derived so that others can adjust their data accordingly to develop meaningful comparisons.

Once you have selected your metric(s), do not just maintain records of water use over time, but track additional information needed to support each functional, people, and/or building metric. For example, building occupancy or number of employees may vary over time, so it is important to obtain and track this information regularly.

Table 1. Examples of Metrics for Various Facility Types[5]

Facility Type	Facility Purpose	Appropriate Metric(s)	Proxy Metric(s)
Data Centers	Store and support data servers	• Water use effectiveness	
Education	Educate students	• Water use per student	• Water use per square foot • Water use per employee
Foodservice	Produce meals for people	• Water use per meal • Water use per customer	• Water use per seat • Water use per square foot • Water use per employee
Healthcare	Assist and care for people	• Water use per patient	• Water use per bed • Water use per employee
Lodging	Provide rooming accommodations for people	• Water use per visitor • Water use per room	• Water use per square foot • Water use per employee
Retirement Homes	Provide rooming accommodations for people	• Water use per resident • Water use per bed	• Water use per square foot • Water use per employee
Manufacturing	Produce raw materials and products	• Water use per physical unit produced	• Water use per square foot • Water use per employee
Offices	Provide space for people for desk work	• Water use per employee	• Water use per square foot
Public Assembly	Provide meeting space for people	• Water use per visitor • Water use per square foot	• Water use per employee
Retail	Sell products	• Water use per customer • Water use per transaction	• Water use per square foot • Water use per employee
Service	Provide services (e.g., repair cars)	• Water use per service provided (e.g., water use per car repaired)	• Water use per square foot • Water use per employee
Warehouses	Provide storage space	• Water use per square foot	• Water use per employee

[5] Water Research Foundation. 2015. *Methodology for Evaluating Water Use in Commercial, Institutional, and Industrial Sectors*. Table 6.1.

Identify Benchmarks and Track Performance

Once appropriate metrics have been chosen, benchmarks must be established or identified as the basis for comparison of building performance. The simplest benchmark is self-referential, where a facility is comparing a current water use metric to a historical baseline. Refer to *WaterSense at Work Section 1.2 Water Management Planning* at www.epa.gov/watersense/best-management-practices for more information on establishing a water baseline.

Where data is available, it can also be beneficial to compare water use metrics to the performance of other facilities. Organizations responsible for numerous facilities can compare water use metrics across their portfolios. For example, a hotel chain may be able to compare water use per occupied room across its portfolio of hotels in a region. Facility owners may also be able to identify external benchmarks to use to compare their water use metrics. While the availability of water use benchmarks is generally limited for commercial and institutional buildings, facility managers should consider contacting their water utility or a local green building or sustainable business organization to determine if benchmarks are available.

How Water Utilities and Local Governments Can Gather Data to Support Benchmarking

Facility managers are often interested in benchmarking their own facilities or facilities within their portfolio, but other groups may be interested in benchmarking as well. Benchmarking can be a helpful tool for utilities and local governments that are interested in working with commercial and institutional buildings to better understand their water consumption and reduce demands on local water supplies. Those looking to developing local or regional benchmarks may need to identify accurate facility characteristics and demographic data. This information may be available through different government or institutional organizations, including:

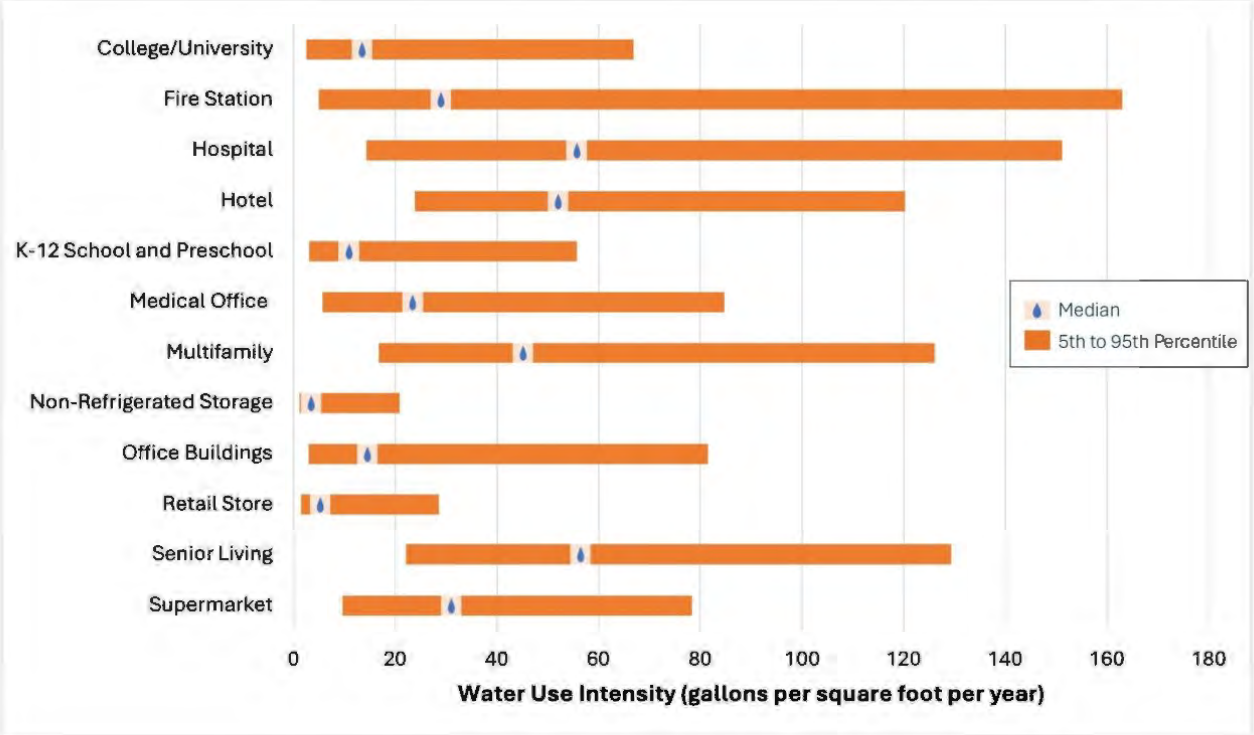
- Local health and fire departments, which can provide data such as the number of seats in a restaurant, the number of rooms in a hotel or nursing home, maximum occupancy rates, and other useful operational information.
- Local property taxing authorities, which maintain complete lists of all commercial facilities along with their classifications and square footage.
- School districts and state education agencies, which can provide information on the number of students and faculty for schools.
- State boards or bureaus of higher education, which can provide detailed information on university and college campus facilities, resident population, and enrollment.
- State health and/or human services agencies, which can provide information on occupancy and staffing of nursing home and rehabilitation facilities.
- State and local health departments, which can provide information on hospital facilities and number of patients. The American Hospital Directory and/or the American Hospital Association may also have helpful data.

Typical WUIs and Other Metrics for Select Property Types

Typical water use information is often difficult to find, especially on the local level. In the absence of local data, it can still be helpful to compare your facility's water use to other representative data available. EPA has developed a technical reference on median WUI values and other metrics observed in a variety of facility types based on water use data entered into ENERGY STAR Portfolio Manager (Table 2 on the next page).

Property types exhibit a range of median WUIs, with some property types exhibiting larger ranges of typical (5th to 95th percentile) WUI. These ranges, shown in Figure 1 below, speak both to the savings potential and the potential influences of different operating characteristics. Property types with higher median WUIs will generally offer more opportunities for savings. Property types with larger ranges of typical WUI will likely exhibit more influences from operating characteristics and features (e.g., climate, size, density).

Figure 1. Range (5th to 95th Percentile) and Median Water Use Intensity (gallons per square foot per year) for Selected Property Types



Factors Impacting Benchmarking

When benchmarking a facility against others locally or nationally, there are a few factors to keep in mind, including climate, equipment use, and facility type and subtype. Multifactor ratings can use models that normalize for several of these factors at once.

Table 2. Water Use Intensity Reference Values for Select Property Types *W*ithin ENERGY STAR Portfolio Manager[6]

Portfolio Manager Property Type	Number of Observations	WUI (gallons/square foot/year) Percentile					Median Property Type Specific Metric
		5th	25th	50th/Median	75th	95th	
College/University	590	2.48	6.20	13.40	28.34	66.92	N/A
Fire Station	126	5.00	13.95	28.90	54.29	162.95	N/A
Hospital (General Medical and Surgical)	347	14.30	38.28	55.71	77.44	151.18	107,000 gallons/ hospital bed/year
Hotel	1,488	23.94	40.06	52.02	69.28	120.23	33,500 gallons/ guest room/year
K-12 School and Preschool (includes Daycare)	1,588	3.04	6.88	10.84	19.71	55.69	11,200 gallons/worker/year
Medical Offices (includes Urgent Care/Clinic/Other Outpatient)	1,177	5.73	12.86	23.40	38.82	84.71	N/A
Multifamily*	258	16.76	31.71	45.15	65.56	126.14	43,600 gallons/unit/year
Non-Refrigerated Warehouse (includes Self-Storage Facility and Distribution Center)	1,675	1.15	1.84	3.43	6.69	20.88	N/A
Office (includes Bank Branch, Financial Office, and Other Offices)	9,627	2.93	7.83	14.48	29.41	81.52	6,020 gallons/worker/year
Retail Store	4,382	1.41	2.84	5.24	8.99	28.59	N/A
Senior Living Community	1,232	22.18	39.80	56.41	77.69	129.26	39,800 gallons/resident/year
Supermarket (includes Grocery Store, Wholesale Club, and Supercenter)	432	9.65	21.03	31.00	45.58	78.42	N/A
* Data Source: 2012 Fannie Mae Energy and Water Market Research Survey							

[6] WaterSense and ENERGY STAR. June 2023. U.S. Water Use Intensity by Property Type: Technical Reference. www.energystar.gov/buildings/tools-and-resources/u_s_water_use_intensity_property_type_technical_reference

It is important to recognize that without normalizing for climate, benchmarks from one region may not be representative of or comparable to benchmarks within another region due to variations in weather and climate. Different climates have different heating and cooling requirements, which can have significant impacts on the water used in steam boilers and cooling towers. Similarly, weather conditions and climate zones impact outdoor water used for irrigation and operation of fountains and swimming pools.

In addition, differences within a particular facility type may significantly affect water use. A resort hotel with recreational facilities and dining, for example, may exhibit different water usage patterns compared to a budget motel.

In general, comparisons of benchmarking data will be more meaningful if they are within the same climate zone and include similar facility types with similar equipment. A multifactor model (such as those used by ENERGY STAR or for the EPA Water Score) can also account for this variability.

Benchmarking Tools

There are several web-based tools available that can be used to help track water use and benchmark performance.

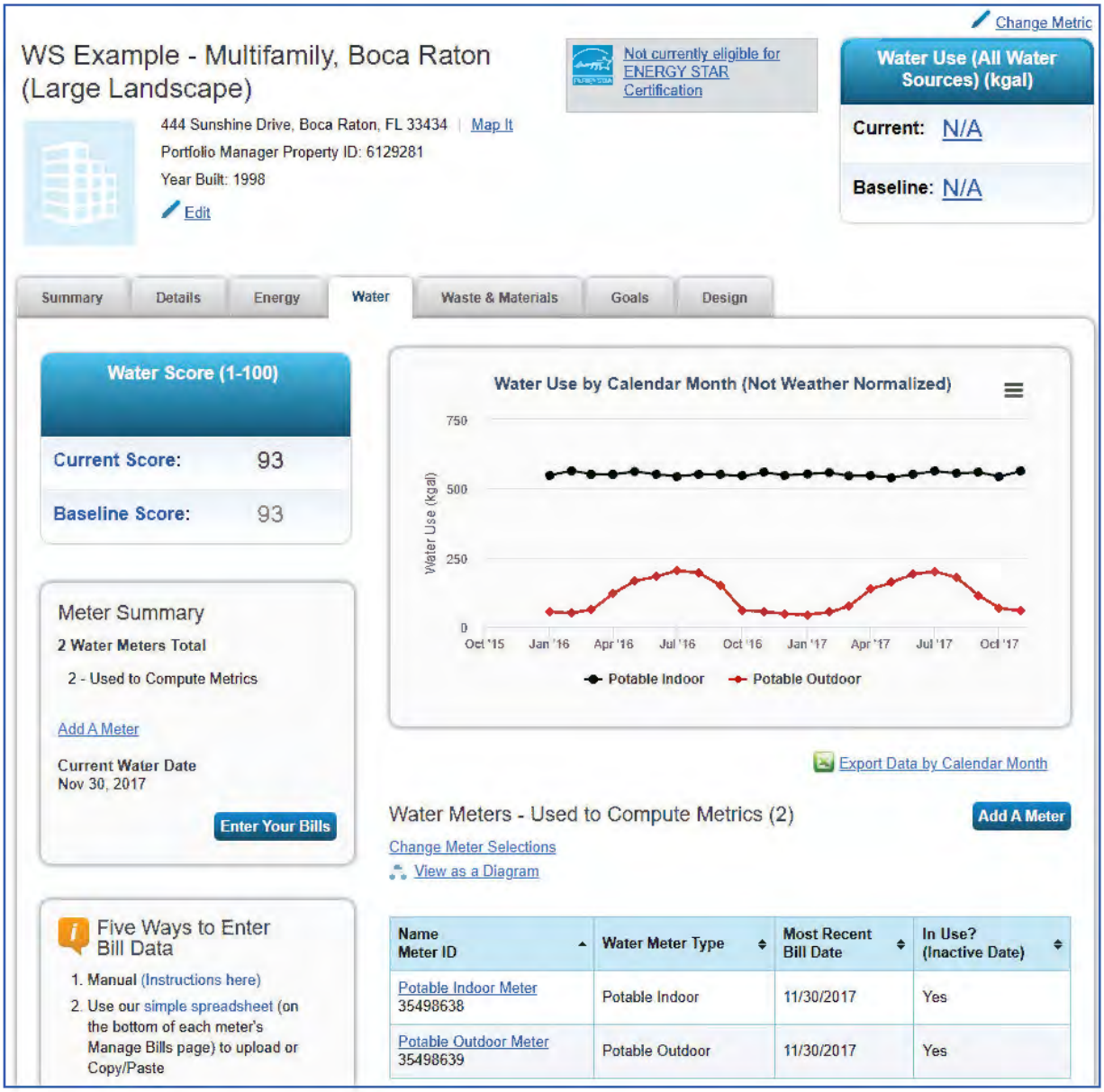
ENERGY STAR Portfolio Manager

ENERGY STAR Portfolio Manager (www.energystar.gov/buildings/benchmark) is a free resource for tracking of energy use, water use, waste, and greenhouse gas emissions for any type of building. It is an interactive resource management tool that offers the ability to benchmark commercial buildings. More than 300,000 properties, comprising more than 25 percent of commercial floorspace in the United States, have used ENERGY STAR Portfolio Manager to measure and track their energy use, water use, and/or waste and materials.[7] More than 130,000 of these properties used ENERGY STAR Portfolio Manager to track water use.

Portfolio Manager allows users to enter meter-level data, track data trends, set baselines and targets for properties, and compare performance across similar facilities. Data can either be entered manually, uploaded using a spreadsheet template, or exchanged through a utility or third-party provider via web services. Figure 2 on the next page shows an example of the Portfolio Manager dashboard.

[7] ENERGY STAR. ENERGY STAR Impacts. www.energystar.gov/about/origins_mission/impacts.

Figure 2. Example ENERGY STAR Portfolio Manager Dashboard



For multifamily properties with 20 or more units, Portfolio Manager can generate a 1-to-100 EPA Water Score indicating how the building uses water compared to similar properties nationwide. EPA provides tools and resources for how to reduce water use and improve a multifamily building's EPA Water Score at www.epa.gov/watersense/water-score-multifamily-housing. The score provides a statistical evaluation of whole-property water use—including both indoor and outdoor use—normalized for weather and multiple operational parameters (such as size, density, and irrigated area). A score is calculated by comparing the true WUI of the property to a similar building's predicted WUI with average efficiency. The result is a 1-to-100 number that identifies how efficient a property is relative to similar facilities given its location and operating characteristics. For example, a building

with a score of 25 is more efficient than 25 percent of multifamily properties and less efficient that 75 percent. Therefore, a higher EPA Water Score is representative of a more efficient property.

Although ENERGY STAR Portfolio Manager only offers an EPA Water Score for multifamily properties, it can still be a helpful tool for tracking the water use of other commercial property types and comparing water use across a portfolio of facilities.

Laboratory Benchmarking Tool

The International Institute for Sustainable Laboratories (I2SL) Laboratory Benchmarking Tool (LBT), developed by Lawrence Berkeley National Laboratory and I2SL, allows users to compare the energy and water use of laboratory buildings across the United States. The LBT is mostly advertised as an energy benchmarking tool for lab buildings, which are unique in terms of energy intensity and cannot receive an ENERGY STAR benchmarking score. However, the LBT also includes the WUI of laboratories in gallons per square foot per year. The LBT can be accessed at https://lbt.i2sl.org/.

Current Initiatives and Programs

Water use benchmarking is an ever-growing practice, and there are many ongoing governmental, academic, and private-sector initiatives and programs that support benchmarking data sets that allow building owners and managers to assess water performance compared to similar facilities.

Federal Initiatives

The U.S. Energy Information Administration's Commercial Buildings Energy Consumption Survey (CBECS, www.eia.gov/consumption/commercial/) is a national sample survey that collects information on U.S. commercial buildings, including energy and water use data. The 2018 survey provides building characteristics information for nearly six million U.S. commercial buildings. While CBECS mostly emphasizes building energy consumption, water use data are available dating back to 2012.

The U.S. Department of Energy (DOE) Better Buildings® Initiative (https://betterbuildingssolutioncenter.energy.gov/) is a voluntary program that aims to accelerate the adoption of efficient building technologies in homes, commercial buildings, and industrial plants. Its Better Buildings Water Savings Network brings organizations together to discuss and demonstrate approaches to conserve water in buildings, plants, and multifamily housing. Water Savings Network partners commit to sharing water use information across their portfolio of buildings.

State, City, and Municipal Initiatives

There are multiple U.S. states and dozens of cities and municipalities in the U.S. and Canada that have mandatory or voluntary energy and/or water benchmarking efforts targeted towards certain subsets of their building sector (e.g., commercial and multifamily buildings greater than 50,000 square feet). Along with benchmarking mandates, some cities also require either water reduction targets be met and/or periodic water audits be performed. For example, Los Angeles requires buildings to document a 20 percent reduction in WUI over the prior five years or undergo a water audit.[8] To learn more about location-specific benchmarking programs or ordinances, the Institute for Market Transformation (IMT) maintains a map related to benchmarking programs and policies in place throughout the United States at www.imt.org/resources/map-u-s-building-benchmarking-policies/.

The 2030 Districts Network is a non-profit organization with the goal of establishing a global network of high-performing districts and cities to mitigate and adapt to climate change. Each District is a designated urban area dedicated to meeting 50 percent reductions in energy, water, and greenhouse gas emissions by 2030. There are currently 23 established districts in the United States and Canada, representing 520 million square feet of commercial building space. Members have access to resources on establishing baselines, toolkits for conducting comparative analyses, and case studies on properties that have successfully improved their resource efficiency.[9]

Other Programs

There are several programs designed to help colleges and universities track and reduce their resource consumption. The Sustainability Tracking, Assessment & Rating System® (STARS) is a self-reporting framework, sponsored by the Association for the Advancement of Sustainability in Higher Education, that allows colleges and universities to measure their sustainability performance, including water use. Institutions are awarded points towards an overall rating system for their ability to reduce potable water use per person, potable water use per unit of floor area, and total water withdrawal per unit of vegetated grounds. Over 1,000 institutions have registered to use to the STARS reporting tool.[10] In 2020, ENERGY STAR launched the Higher Education Benchmarking Initiative (HEBI), a free and voluntary program designed to help colleges and universities understand how the energy and water performance of their campuses compare to those of peer institutions. HEBI allows institutions to track absolute water use and WUI through ENERGY STAR Portfolio Manager.

[8] Retrofit.LA. https://retrofit.la.

[9] 2030 Districts Network. www.2030districts.org/.

[10] Association for the Advancement of Sustainability in Higher Education (AASHE). The Sustainability Tracking, Assessment & Rating System (STARS). https://stars.aashe.org/.

The Cornell Hotel Sustainability Benchmarking (CHSB) study is an annual study that collects energy and water data from thousands of hotels around the world, including from major international hotel brands. This tool allows hotels to evaluate energy and water performance compared to average performance for different types of hotels in different regions.[11]

While not necessarily a benchmark to evaluate facility-level water use performance, the Carbon Disclosure Project (CDP) collects corporate disclosures on water data from companies worldwide and subsequently issues an annual Global Water Report. This represents a growing trend among companies to better manage their water use and disclose water issues.[12]

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APPENDIX C
WATER PARK WATER USAGE

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Part Two of Defining Water Use, Water Consumption in Indoor, Outdoor Water Parks

By **Eric B. Hansen, AIA, ISHC** - December 28, 2015



Eric B. Hansen, AIA, ISHC

A water consumption ratio is a metric by which we can begin to understand the actual consumption of water at recreational water attractions. As identified in part one of this series, the water consumption ratio is the number of gallons used daily as top off for a water attraction divided by the total initial fill gallons. The ratio represents the portion of the water actually consumed on a daily or monthly basis. This article profiles several outdoor waterpark attractions and analyzes their water consumption versus their water use.

For purposes of our discussion, the initial fill gallons equate to the amount of water used or the iction's water use. The amount of water added to the system equates to water consumption.

door Waterpark Profiles

following are profiles of outdoor waterparks in various regions across the United States. We have their identities confidential and appreciate their willingness to share their water consumption stics to benefit the industry.

loor Waterpark A is in the Southeast and includes approximately 63,000 square feet of aquatic ace area, zero entry wave pool, lazy river, tipping bucket play structure, mat racer, slide tower three slides, and splash pad. The venue is open approximately 100 days per season with an age attendance of 1,650 per day.

Outdoor Waterpark B is in the Northeast and includes approximately 30,000 square feet of wet area with no standing bodies of water, only run-out troughs and splash pads. The venue offers two slide towers with a total of five slides, play structure with tipping bucket, and splash pad. The venue is open 100 days per season with an average attendance of 1,760 per day.

Outdoor Waterpark C is in the Midwest and includes a 10,100 square foot lap pool with slide tower and two slides, a 1,600 square foot diving well, and a kiddie splash pool of 1,600 square feet with mushroom geysers. The facility is open approximately 100 days per year with an average attendance of 230 per day.

Outdoor Waterpark D is in the Midwest and includes an aquatic surface area of 13,200 square feet with a zero entry pool, lazy river, lap pool with diving well, slide tower with three slides, and a tipping

bucket play structure. The facility is open approximately 100 days per year and has an average attendance of 450 per day.

Outdoor Waterpark E is in the central region of the country and includes a wave pool, lazy river, two kiddie pools, five slide towers with more than 12 slides, and extreme water attractions. The facility is open approximately 100 days per year with an average attendance of 1,200 per day.

What Impacts Water Consumption

For outdoor waterparks, climate affects evaporation and water consumption. More water evaporates in arid climates. Wind speed and temperatures also affect evaporation. The following table presents the profiled waterparks and their water consumption ratios.

Outdoor Waterpark Water Consumption Comparisons

Facility	Initial Fill Gallons	Daily Top Off Gal/Day	Consumption Ratio
A	1,200,000	3,871	0.32%
B	45,000	2,200	4.89%
C	306,000	357	0.12%
D	564,000	3,000	0.53%
E	890,000	650	0.07%

Source: Hotel & Leisure Advisors

consumption ratio is as varied as the waterpark locations, which illustrates the complexities ived in assessing water consumption at outdoor waterparks. More data is needed in order to ;hmark consumption ratios and develop more complete analysis. However, the data shown in this le provide generalities regarding waterpark design. For instance, a larger body of water for an ...al fill (water use) does not necessarily mean a higher water consumption ratio. Other variables for consideration are the types and ages of filtration systems used. Facility A utilizes high-speed sand filters; Facility B utilizes a combination of sand filters and regenerative media filters; Facility C utilizes DE (Diatomaceous Earth) filters; Facilities D and E utilize high-speed sand filters. Many of the properties we interviewed report anticipated capital replacements of filtration systems to help reduce water consumption.

Another variable that affects water consumption are the water attractions. Facility B does not offer any large body or pool of water, and its water use comes from the system's splash-out and spray attractions; therefore, its water consumption ratio is higher than the other facilities. But this does not necessarily mean Facility B's 4.89 percent consumption ratio is out of balance comparatively. Rather, what is needed is a means to understand the water consumption ratio with regard to the overall amount of water consumed for that particular location on a per capita basis.

Water Consumption Per Capita Comparisons

The U.S. Geological Survey collects water use data by state and county in a variety of categories of use. For our analysis we reviewed domestic use—water used for indoor and outdoor household purposes. These figures represent how much water an individual consumes on a daily basis. The following table presents the profiled waterparks' domestic per capita water consumption per day based on 2010 county information. We note that these figures are for water that is public-supplied and not self-supplied.

Outdoor Waterpark Water Consumption Per Person Comparisons

Facility	Daily Consumption Gal/Person/Day*	Daily Top Off Gal/Day	Water Consumption Equivalent Persons
A	100	3,871	39
B	75	2,200	29
C	72	357	5
D	72	3,000	42
E	65	650	10

sed on 2010 USGS County Information
rce: Hotel & Leisure Advisors

daily top-off water consumption (gallons per day) at each facility is divided by the location's daily estic water consumption (gallons per person per day). The resulting figure equates to an valent number of people in water consumption that the waterpark achieves. Facility B, for nple, consumes as much water as 29 individuals living in that community on a daily basis, while lity D consumes as much water as 42 individuals living in that community on a daily basis. These r figures can now be compared to daily attendance figures.

utdoor Waterpark Water Consumption Comparison

Facility	2015 Daily Attendance	Water Consumption Equivalent Persons
A	1,650	39
B	1,760	29
C	230	5
D	450	42
E	1,200	10

Source: Hotel & Leisure Advisors

The water consumption-equivalent persons represent a fraction of the total attendance at each waterpark. Water use benefits 100 percent of attendees. For example, Facility A's water use benefits all 1,650 attendees, while its water consumption is the equivalent of what 39 people consume on a daily basis. The analysis supports the notion that water consumption at waterparks is relatively low.

In a time where water conservation has taken center stage in drought and drought-prone areas, the waterpark industry needs to clearly articulate its position and respond to inaccurate perceptions of water waste and consumption at recreational water attractions.

Waterpark Water Conservation Key Points

The following is a summary of key points and definitions regarding water use and water conservation at waterparks. These points can be a part of the industry's ongoing dialogue regarding water conservation.

- Water use = initial fill, i.e. the amount of water in the entire water system used by all in attendance.
- Water consumption = daily or monthly top off, i.e. the amount of water consumed at the attraction.
- Water consumption ratio = water consumption divided by water use.
  Water consumption and water use are not interchangeable terms.
  Water consumption results from four waterpark operations: backwash, evaporation, deck wash
  n, and splash out.
  Water consumption is affected by many variables, including seasonality, physical water attraction
  butes, and climate.
  Indoor waterparks and outdoor waterparks have different water consumption ratios, most
  butable to climate and evaporation variables.
  Big recreation water attractions allow water use for a population that is an alternative to
  lential swimming pools in drought-stricken areas.
  Water conservation at waterparks is an inherent design principle as owners/operators continually
  : improvements to lower water consumption ratios that are driven by operating costs. Saving
  ...ter one drop at a time adds to the bottom line.

This article was originally published in World Waterpark Magazine.

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APPENDIX D
TORTUGA BAY WATER PARK PROJECT WSA CONSISTENCY WITH DWR GUIDELINES

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Tortuga Bay Project WSA – Consistency with DWR Guidelines

Guidelines Section Number and Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
Section 1 (page 2). Does SB 610 or SB221 apply to the proposed project?	Is the project subject to SB 610? Is the project subject to CEQA (Water Code §10910(a)? If yes, continue.	WSA Section 1.1. Yes, the project is subject to SB610 and CEQA.
	Is it a "Project" as defined by Water Code §10912(a) or (b)? If yes, to comply with SB 610 go to Section 2.0, page 4.	WSA Section 1.1. Yes, the Project is considered to meet the definition of "project" per Water Code §10912(a) or (b).
	Is the project subject to SB 221? Does the tentative map include a "subdivision" as defined by Government Code §66473.7(a)(1)? If no, stop.	No, the Project does not include a "subdivision", SB 221 does not apply to the Project, and no further action relevant to SB 221 is required.
Section 2.0 (page 4). Who will prepare the SB 610 analysis?	Is there a public water system ("water supplier") for the project (Water Code §10910(b)? If no, go to Section 3.0, page 6.	Yes, the project site is proposed to be connected to a public water system.
Section 3.0 (page 6). Has an assessment already been prepared that includes this project?	Has this project already been the subject of an assessment (Water Code §10910(h)? If no, go to Section 4.0, page 8.	No, the Project has not been the subject of an assessment.
Section 4.0 (page 8). Is there a current Urban Water Management Plan?	Is there an adopted urban water management Plan (Water Code §10910(c)? If yes, continue. If yes, the information from the UWMP related to the proposed water demand for the project may also be used for carrying out Section 5.0, Steps 1 and 2, Section 7; proceed to Section 5, page 10 of the Guidelines.	WSA Sections 2.2 and 2.4. Yes, there are two adopted UWMPs in and adjacent to the Project area.
	Is the project water demand for the project accounted for in the most recent UWMP (Water Code §10910(c)(2)? If no, go to Section 5.0, page 10.	Not applicable
Section 5.0 (page 10). What information should be included in an assessment?	Step One (page 13). Documenting wholesale water supplies.	The Project water supply agency is both a retail and a wholesale water supplier.
	Step Two (page 17). Documenting Supply if Groundwater is a Source.	The Kern County Subbasin is the proposed water supply by the City of Bakersfield. WSA Section 2.2.2.

Guidelines Section Number and Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
	Specify if a groundwater management plan or any other specific authorization for groundwater management for the basin has been adopted and how it affects the water supplier's use of the basin.	WSA Section 2.3. A groundwater management plan is currently in place for the Kern County Subbasin.
	Description and analysis of the amount and location of groundwater pumped by the water supplier for the past five years. Include information on proposed pumping locations and quantities. The description and analysis is to be based on information that is reasonably available, including, but not limited to, historic use records from DWR.	See Section 4 and (referenced) City of Bakersfield and California Water Service Company, Bakersfield District, Urban Water Master Plans.
	Analysis of the location, amount, and sufficiency of groundwater that is projected to be pumped by the water supplier.	See Section 4 and (referenced) City of Bakersfield and California Water Service Company, Bakersfield District, Urban Water Master Plans.
	Step 3 (page 21). Documenting project demand (Project Demand Analysis).	See Section 4 and (referenced) City of Bakersfield and California Water Service Company, Bakersfield District, Urban Water Master Plans.
	Step 4 (page 26). Documenting dry year(s) supply.	WSA Section 6.1 addresses water supply availability including during dry years.
	Step 5 (page 31). Documenting dry year(s) demand.	WSA Section 6.1 addresses water supply availability including during dry years.
Section 6.0 (page 33). Is the projected water supply sufficient or insufficient for the proposed project		WSA Section 7.0 states the basis for evaluation.
Section 7.0 (page 35). If the projected supply is determined to be insufficient.	Does the assessment conclude that supply is "sufficient"? If no, continue.	WSA Section 7.0 concludes that sufficient water supplies are available for the Project.
Section 8.0 (page 38). Final SB 610 assessment actions by lead agencies.	The lead agency shall review the WSA and must decide whether additional water supply information is needed for its consideration of the proposed project. The lead	Section 1.1. The WSA for the Project must be approved prior to or in concurrence with the EIR.

Guidelines Section Number and Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
	agency "shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses."	
	The description of the groundwater basin may be excerpted from the groundwater management plan, from DWR Bulleting 118, California's Ground Water, or from some other document that has been published and that discusses the basin boundaries, type of rock that constitutes the aquifer, variability of the aquifer material, and total groundwater in storage (average specific yield times the volume of the aquifer).	WSA Section 2.1 provides a description of the Project-applicable groundwater subbasin characteristics.
	In an adjudicated basin the amount of water the urban supplier has the legal right to pump should be enumerated in the court decision.	Not applicable.
	Estimates of overdraft, or "water shortage", based on projected amounts of water supply and demand (basin management).	In WSA Section 6.1 groundwater resource limitations and usage are discussed.
	If the evaluation indicates an overdraft due to existing groundwater extraction, or projected increases in groundwater extraction, describe actions and/or program designed to eliminate the long-term overdraft condition.	The Kern County Water Agency Management Plan describes in detail the subject actions and programs; the Sustainable Groundwater Management Plan will further address this subject.

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APPENDIX E
2020 URBAN WATER MANAGEMENT PLANS – CITY OF BAKERSFIELD AND CALIFORNIA WATER SERVICE – BAKERSFIELD DISTRICT

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City of Bakersfield

2020 Urban Water Management Plan

December 2021

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List of Acronyms and Abbreviations

AB	Assembly Bill
Act	Urban Water Management Planning Act
AF	Acre-feet
AWWA	American Water Works Association
BMP(s)	Best management practice(s)
Cal Water	California Water Service Company
CASGEM	California Statewide Groundwater Elevation Monitoring
CEQA	California Environmental Quality Act
CII	Commercial, industrial, and institutional
CIMIS	California Irrigation Management Information System
City	City of Bakersfield
Corps	Army Corps of Engineers
CPUC	California Public Utility Commission
CSD	Community Services District
CWC	California Water Code
DMM(s)	Demand management measure(s)
DOF	Department of Finance
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
EC	Electrical Conductivity
EIR/EIS	Environmental Impact Report/Environmental Impact Statement
ET	Evapotranspiration
GHG	Greenhouse gas
GIS	Geographic Information System
GPCD	Gallons per capita per day
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
Guidebook	DWR 2020 Urban Water Management Plans Guidebook for Urban Water Suppliers
ID4	Improvement District No. 4
IRWM	Integrated Regional Water Management
IRWMP(s)	Integrated Regional Water Management Plan(s)
KCWA	Kern County Water Agency
Kern COG	Kern Council of Governments
KRGSA	Kern River Groundwater Sustainability Agency
MCL	Maximum Contaminant Level
M&I	Municipal and Industrial
MGD	Million gallons per day
mg/l	Milligrams per liter
MOU	Memorandum of Understanding
MTBE	Methyl Tertiary Butyl Ether
MWC	Mutual Water Company
Plan (or UWMP)	Urban Water Management Plan
RTP	Regional Transportation Plan
SB	Senate Bill
SB X7-7	Water Conservation Bill of 2009
SCADA	Supervisory Control and Data Acquisition
SWRCB	State Water Resources Control Board
SWRCB-DDW	State Water Resources Control Board – Division of Drinking Water
SWP	State Water Project

TCP	1,2,3-Trichloropropane
TDS	Total Dissolved Solids
Tenneco	Tenneco West
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment
WSCP	Water Shortage Contingency Plan
WUE	Water Use Efficiency
WWTP	Wastewater Treatment Plant

Section 1: Introduction and Lay Description

1.01 Background and Purpose

The California Urban Water Planning Act (Act) requires urban water suppliers that have 3,000 or more service connections or supply 3,000 or more acre-feet (AF) of water per year to develop an Urban Water Management Plan (UWMP or Plan), which is submitted to the California Department of Water Resources (DWR) every five years. Significant changes have been made to the Act since the previous UWMP was prepared in 2015. These changes were made to allow suppliers to consider the impacts of prolonged droughts, groundwater overdraft, regulatory revisions, and changing climate conditions as a part of their urban water management planning process.

The major new requirements from the 2015 Plan include:

- Expanding the multi-year water reliability assessment to cover five consecutive dry-years;
- Preparing a Drought Risk Assessment covering a five-year period from 2021 to 2025 and examining reasonable predictions of water supplies, water uses, and water availability;
- Specifically addressing seismic risk and mitigation planning for water system facilities;
- Providing readily available information on estimates of energy usage for water supply operations;
- Expanding water loss reporting to include the past five years of water loss audit reports;
- Modifying Water Shortage Contingency Plans to meet more stringent regulations;
- Coordinating groundwater supply information to be consistent with applicable Groundwater Sustainability Plans (GSP); and
- Providing a lay description of the fundamental determinations of the UWMP.

The current Water Code requires 2020 UWMPs to include:

- Current and projected water uses considering long-term planning documents such as General Plans and Specific Plans;
- An analysis of water supplies including potential restrictions or limitations on water supply availability;
- An analysis of water supply reliability under normal conditions, single-dry year conditions, and five consecutive dry year conditions through at least the year 2040;
- A Drought Risk Assessment for a hypothetical five-year drought condition; and
- A Water Shortage Contingency Plan that specifies opportunities for demand reduction and supply augmentation under various water shortage conditions.

This 2020 UWMP includes both the City of Bakersfield's (City's) Domestic Water System (retail) and Wholesale Water System (wholesale). The 2020 UWMP is an update to the 2015 UWMP adopted by the City. However, the 2020 UWMP is considered a stand-alone document.

This 2020 UWMP Update has been prepared in accordance with the DWR "Urban Water Management Plan Guidebook 2020" (Guidebook). The format of the Plan generally follows the recommended organization in Chapter 1.1 of the Guidebook and incorporates the required standardized tables as numbered and shown in the Guidebook and as appropriate for the City's wholesale and retail operations. Some of the tables are not applicable to the respective systems and are not included as noted in the text.

1.02 Report Organization

The UWMP contains ten sections as outlined below:

- Section 1 – Introduction and Lay Description
- Section 2 – Plan Preparation
- Section 3 – System Description
- Section 4 – Water Use Characterization
- Section 5 – SB X7-7 Baselines, Targets, and 2020 Compliance
- Section 6 – Water Supply Characterization
- Section 7 – Water Supply Reliability and Drought Risk Assessment
- Section 8 – Water Shortage Contingency Plan
- Section 9 – Demand Management Measures
- Section 10 – Plan Adoption, Submittal, and Implementation

1.03 Compliance with 2020 Water Use Targets

Adoption of SB X7-7 (Water Conservation Bill of 2009) required retail urban water suppliers to develop baseline daily per capita water use and urban water use targets with the goal of reducing per capita water use by 20 percent by 2020. In the 2020 Plan, retail urban water agencies must demonstrate compliance with their established water use targets for the year 2020. **The City's Domestic Water System achieved compliance with its confirmed 2020 water use target** as shown in **Table 1-1**.

Further discussion of compliance is discussed in **Section 5.** The SB X7-7 compliance forms are included in **Appendix G**.

Table 1-1: 2020 Compliance Summary

Agency	2020 Actual Water Use*	Confirmed 2020 Target*
City of Bakersfield	**252**	**253**
*All values are in Gallons per Capita per Day (GPCD)		
NOTES: See SB X7-7 Compliance Forms in Appendix G.		

1.04 Lay Description - Fundamental Determinations of the UWMP

California Water Code

> *Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan (10630.5).*

As detailed in the following sections of this Urban Water Management Plan (UWMP), the City of Bakersfield's (City) Domestic Water System and Wholesale Water System have sufficient water supplies to meet the needs of their customers for the next twenty years and beyond. Fundamental determinations in this UWMP are summarized as follows.

Water System Description

The Domestic Water System is a retail water supplier managed by the City's Water Resources Department and operated under a service contract with California Water Service (Cal Water). The service area boundaries for the Domestic Water System include only a portion of the City of Bakersfield. Remaining areas of the City are served by other retail water suppliers. The primary source of supply for the Domestic Water System is groundwater and recharged surface water supplies pumped from City owned wells. This is supplemented by water from surface water treatment plants owned by Cal Water and Kern County Water Agency Improvement District No. 4 (KCWA ID4).

In 2020, the City's Domestic Water System service area consisted of 48,140 municipal connections and it supplied a volume of 45,649 acre-feet of water to its service area. **Actual 2020 water usage of 252 gallons per capita per day (gpcd) within the Domestic Water System service area complied with its confirmed 2020 water use target of 253 gpcd as required by the Water Conservation Bill of 2009 (SB X7-7).**

The City's Wholesale Water System is operated by the City's Water Resources Department which oversees the City's Kern River water rights and water supplies. Kern River water supplies are either delivered to surface water treatment plants for subsequent use by retail water suppliers within the City area or are replenished to the groundwater basin for the benefit of the City and other retail water suppliers through their respective groundwater wells. A volume of 77,528 acre-feet of Kern River surface water was delivered through the Wholesale Water System during 2020.

Water Use Projections

The City has adopted General Plan and Zoning Ordinances which include land use goals, policies, and implementation measures for development. Proposed land uses within the City's Domestic Water Service Area per the General Plan are similar to current land uses within the City. These primarily consist of residential uses with some commercial, light industrial, schools, and parks. Population growth is anticipated to be about 1.8 percent annually based on historic growth rates.

Water demands are anticipated to increase in proportion to population growth. Water demands in the Domestic Water System service area are projected to total approximately 65,589 acre-feet annually in 2040. Water demands in the Wholesale Water System for delivery to surface water treatment plants and groundwater recharge are projected to total 100,000 acre-feet annually. The City's projected water usage estimates are expected to adequately address climate change impacts during the period covered by this UWMP.

Water Supplies and Reliability

The City is a member of the Kern River Groundwater Sustainability Agency (KRGSA) which was formed in compliance with the Sustainable Groundwater Management Act (SGMA) to cooperatively manage local groundwater in a sustainable manner. The KRGSA adopted its Final Groundwater Sustainability Plan (GSP) in January 2020. The KRGSA GSP was submitted to the California Department of Water Resources (DWR) in coordination with four other GSPs that together cover the entire 2,834 square mile Subbasin. The KRGSA GSP identifies management actions and proposes projects to maintain the groundwater resource in a sustainable condition under future climate change conditions for the next 50 years.

The KRGSA GSP identifies sustainable management criteria for water levels based on the historic low water levels experienced in 2015-2016. Maintaining water levels above the Minimum Threshold levels identified in the KRGSA GSP is anticipated to allow the City's wells to meet the demands of the Domestic Water System while minimizing undesirable results such as declining pump capacity, well inefficiency, water levels falling below pump intakes and pump screens, and degraded water quality. With implementation of the actions in the KRGSA GSP, the City's groundwater and recharged surface water supplies are anticipated to be sufficient to meet its demands for the next 50 years.

The Domestic Water System has sufficient redundancy to allow for wells and other facilities to be taken offline as needed for maintenance or repairs. The City has installed standby generators at its well facilities so that it can continue to provide water supplies in the event of an electrical power outage. Wellhead groundwater treatment facilities have been installed where necessary in order to continue providing water supplies that meet current potable water standards. As population and water demands increase with the Domestic Water System service area, the City will construct the new wells required to meet the increased demands. Groundwater wells will be equipped with wellhead treatment as necessary to remove contaminants such as arsenic and 1,2,3-Trichloropropane that exceed water quality standards. When SWP supplies are not available from KCWA ID4, the City is able to deliver its Kern River supplies to KCWA ID4 for treatment in place of SWP supplies.

The Wholesale Water System provides groundwater recharge of Kern River water supplies both by transportation through the Kern River and unlined portions of the Carrier Canal and within groundwater replenishment areas such as the City's 2800 Acres recharge facility, Truxtun Lakes, Aera Park, and the Park at Riverwalk. The Environmental Impact Report (EIR) for the Kern River Flow and Municipal Water Program estimated the City's Kern River water supplies for both urban use and agricultural use to average about 135,000 acre-feet per year. Approximately 100,000 acre-feet of the 135,000 acre-feet is designated for urban use The City has storage rights in Lake Isabella that allows for flexibility in the management of its Kern River supplies.

Water Shortage Contingency Planning

A Water Shortage Contingency Plan (WSCP) is adopted as a part of this UWMP and provides measures, referred to as response actions, to be implemented in the event of water shortages. The WSCP for the City has been prepared in accordance with current Water Code requirements and outlines a program for responding to water supply limitations. The intent of the water conservation measures and progressive restrictions on water use identified in the City's WSCP are to provide guidance to the City in managing and mitigating anticipated water supply shortages. The structured steps are designed to allow the City to assess its available water supplies and implement appropriate measures in response to actual conditions so that water shortages can be managed efficiently, predictably, and with accountability.

A water shortage condition is defined as when available water supplies are insufficient to meet the normally expected customer demands. Water shortage conditions may be a result of population growth, climate change, drought, catastrophic events, or other water shortage emergencies declared by either the City, State or Federal government.

In accordance with Water Code requirements, there are six standard water shortage levels and response actions defined in the City's WSCP that increase restrictions on water use in response to increasing levels of water shortage conditions ranging from 10 percent to greater than 50 percent.

The City's WSCP is a stand-alone document. The response actions and other considerations in the City's WSCP will be reviewed on a periodic basis to determine the effectiveness of the implementation of the various measures to achieve the desired water demand reductions. Proposed revisions to the WSCP will be submitted to the City Council for adoption.

Demand Management Measures

The City has implemented demand management measures (DMMs) to achieve its water conservation targets. The City partners with Cal Water for the implementation of its Water Conservation Program. Cal Water maintains a Water Conservation Program Coordinator that oversees the water conservation programs available to the City's Domestic Water System service area customers. While the Domestic Water System has achieved its water use reduction targets, it will continue with the implementation of its existing DMMs and look for ways to improve water use efficiency.

Section 2: Plan Preparation

2.01 Agency Identification

The City's Domestic Water System is a retail urban water supplier. The Domestic Water System is managed by the City's Water Resources Department and operated under a service contract with California Water Service (Cal Water). The service area boundaries for the Domestic Water System include only a portion of the City of Bakersfield. Remaining areas of the City are served by other retail water purveyors. The primary source of supply for the Domestic Water System is recharged Kern River water and groundwater pumped from City owned wells. This is supplemented by treated Kern River water and occasional supplies of treated State Water from surface water treatment plants owned by Cal Water and Kern County Water Agency Improvement District No. 4 (KCWA ID4).

In 2020, the City's Domestic Water System service area consisted of 48,140 municipal connections and it supplied a volume of 45,649 acre-feet of water to its service area. See **Table 2-1.**

Table 2-1 Retail Only: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
1510031	City of Bakersfield	48,140	45,649
TOTAL		**48,140**	**45,649**
NOTES:			

The City's Wholesale Water System is operated by the City's Water Resources Department which oversees the City's Kern River water rights and water supplies. Through the Wholesale Water System, raw Kern River water supplies are provided for groundwater replenishment and to surface water treatment plants.

This 2020 UWMP is an individual plan. The City is not part of a regional alliance. See **Table 2-2**.

The City is both a retail urban water supplier through its Domestic Water System and a wholesale urban water supplier through its Wholesale Water System. Information in this UWMP is presented in Calendar Year format and water quantities are presented in Acre Feet. See **Table 2-3**.

The City is preparing

Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☑	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
Units of measure used in UWMP	
Unit	AF
NOTES:	

2.02 Coordination and Outreach

California Water Code

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable (10620(d)(3)).

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan (10642).

Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f) (10631(h)).

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan (10621(b)).

While the City's Domestic Water System receives the majority of its water supply from the Kern River water rights of the City's Wholesale System, the City's Domestic Water System also receives a portion of its water supply from KCWA ID4 as a wholesale supplier. The City has coordinated the preparation of the Plan with KCWA's ID4 as shown in **Table 2-4 Retail**.

Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
Kern County Water Agency ID4
NOTES:

The City's Wholesale Water System provides Kern River surface water to Cal Water's North Garden and Northeast Bakersfield Water Treatment Plants and provides Kern River water for groundwater replenishment for urban water demands within City limits. **Table 2-4 Wholesale** lists the retail water suppliers that were informed of water supply projections as a part of the UWMP development process.

Table 2-4 Wholesale: Water Supplier Information Exchange
Supplier has informed the following water suppliers of water supplies available in accordance with CWC 10631.
Water Supplier Name
California Water Service
NOTES:

In addition to the water suppliers listed in **Table 2-4 Retail** and **Table 2-4 Wholesale**, the City coordinated the preparation of the Plan with the City of Bakersfield City Clerk, the Kern County Clerk, Kern County Planning Department, and the following water agencies that share a common source: Casa Loma Water Company, East Niles Community Services District, Greenfield County Water District, North of the River Municipal Water District, Oildale Mutual Water Company, Rosedale-Rio Bravo Water Storage District, and

Vaughn Water Company. These agencies were provided notice that an update to the UWMP was being prepared at least 60 days prior to the public hearing and invited to participate in the update to the Plan. Further information on coordination of the Plan and public involvement is included in **Section 10**. Copies of notices are included in **Appendix A**.

Section 3: System Description

3.01 General Description

California Water Code

Describe the service area of the supplier (10631(a)).

The City of Bakersfield is located at the southern end of the San Joaquin Valley approximately 100 miles north of the City of Los Angeles. The City is the largest metropolitan area in Kern County and serves as the county seat. The Sierra Nevada mountains are located to the northeast of the City and the Tehachapi Mountains are located to the south.

The City of Bakersfield purchased Kern River assets, including a majority of its water rights, along with canals, land, and the physical water distribution systems for the Ashe Domestic Water Service Area from Tenneco West (Tenneco) on December 22, 1976. The Kern River water rights, canals, and land now comprise the City's Wholesale Water System. The Ashe Domestic Water Service Area has been expanded over time and now functions as the City's Domestic Water System.

The boundaries of the City's Domestic Water System Service Area and the other retail water suppliers serving lands within the City limits are shown on **Plate 1**. The City's Domestic Water System Service Area covers approximately 58 square miles in the westerly portion of the City limits, as shown on **Plates 2 and 3,** and provided water service to 48,140 connections in 2020. Service connections within the Domestic Water System are primarily residential with some commercial, light industrial, and public uses. Cal Water operates and maintains the City's Domestic Water System under contract.

The City's Wholesale Water System service area includes all lands within the City's boundaries. The City's Kern River water rights provide water supplies to the Wholesale Water System. These supplies are transported though the Kern River channel and canal systems for delivery to water treatment plants owned and operated by Cal Water and KCWA's ID4 and to groundwater replenishment areas such as the City's 2800 Acre recharge facility. The City's groundwater replenishment operations with Kern River water are for the benefit of the retail water suppliers providing service to City area through their respective groundwater wells. The water facilities used for recharge and recovery of Kern River supplies within the Wholesale Water System service area are detailed on **Plate 4.** Non-City owned groundwater wells are shown on **Plate 4** and are supplied by the Wholesale Water System.

3.02 Service Area Climate

California Water Code

Describe the climate of the supplier (10631(a)).

The City is located in the southern San Joaquin Valley with elevations ranging from about 300 feet to about 800 feet. Precipitation mainly occurs during the months of October through April. Winter months are generally mild, with frequent fog occurring during December and January at times when cooler air is trapped in the valley by a high pressure system. Summer months are typically hot and dry. **Table 3-0** presents the

monthly average rates of evapo-transpiration (Eto), minimum and maximum temperatures, and precipitation within the service area.

Table 3-0: Climate

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Monthly Eto[a] (inches)	1.54	2.37	4.12	5.66	7.56	8.73	9.14	8.5	6.18	4.15	2.13	1.44	61.52
Average Precipitation (inches)[b]	1.16	1.24	1.21	0.52	0.18	0.08	0.00	0.04	0.08	0.30	0.64	1.02	6.47
Average Max Temperature (Fahrenheit)[b]	57.8	64.0	69.4	76.0	84.1	92.3	98.5	96.6	90.9	80.6	67.4	57.7	77.9
Average Min Temperature (Fahrenheit)[b]	38.9	42.3	45.8	50.1	57.0	64.0	70.0	68.5	63.7	54.5	44.8	38.7	53.2

Sources:

[a] CIMIS Reference Evapotranspiration Zones, January 2012. Standard Monthly Average Eto is for Station 125 (Arvin-Edison).

[b] Western Regional Climate Center, Bakersfield Station (KBFL), 2019 Local Climatological Data Annual Summary with Comparative Data.

3.03 Service Area Population and Demographics

California Water Code

> *Describe the service area of the supplier, including current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available, and (10631(a)).*
>
> *Describe the service area of the supplier, including . . . other social, economic and demographic factors affecting the supplier's water management planning (10631(a)).*

The 2020 population estimate for the Domestic Water System Service Area was determined using population per residential connection data from the DWR Population Tool for census years 1990, 2000, and 2010 and the number of residential connections for 2020. Projecting the population per residential connection trend generates an estimate of 3.59 persons per residential connection for 2020. Multiplying 3.59 persons per residential connection by the 45,120 residential connections within the Domestic Water Service Area in 2020 results in an estimated population of about 161,980. Population projections for the years 2025 through 2040 were calculated based on a population growth rate for the Metro Bakersfield Area of 1.8 percent per year per the 2018 Regional Transportation Plan (RTP) prepared by the Kern Council of Governments (Kern COG) [1]. See **Table 3-1 Retail**.

[1] 2017-2042 Forecast Growth Average Annual Rate for Metro Bakersfield Population per Table 3-5: Growth Trends for Kern County and Selected Communities

The State of California Department of Finance (DOF) prepares reports with population estimates for Cities and Counties on an annual basis. The DOF report was used for the 2020 population estimate for the wholesale service area, which is assumed to be the same as the City of Bakersfield City boundary. Population projections for the years 2025 through 2040 were estimated using the same 1.8 percent annual growth rate as used for the Domestic Water System Service Area. See **Table 3-1 Wholesale**.

Table 3-1 Retail: Population - Current and Projected

Population Served	2020	2025	2030	2035	2040
	161,980	177,090	193,610	211,670	231,420

NOTES: 2020 population based on the population per connection method using a population per residential connection of 3.59 multiplied by the 45,120 residential connections within the retail service area for 2020. Projections for 2025 through 2040 based on a population growth rate of 1.8 percent per year per the Kern COG 2018 RTP.

Table 3-1 Wholesale: Population - Current and Projected

Population Served	2020	2025	2030	2035	2040
	394,328	431,112	471,328	515,295	563,363

NOTES: 2020 Population from DOF Table E-5. Population projections for 2025 through 2040 based on a population growth rate of 1.8 percent per year per the Kern COG 2018 RTP.

There are a few Census Block Groups within the Domestic Water Service Area that qualify as Low-Moderate Income per the City of Bakersfield Planning Division. These areas are estimated to comprise approximately 3 percent of the City's retail service area. The Housing Element of the City of Bakersfield's General Plan indicates that approximately 43 percent of the overall City population is identified as low or very low income. The City continues to have a relatively high number of persons per household as reflected in its population estimates.

3.04 Land Uses within Service Area

California Water Code

> *The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities ... (10631(a)).*

Land use is governed by the City for areas within its service area. The City has adopted a General Plan and Zoning Ordinances which include land use goals, policies, and implementation measures for development. Proposed land uses within the City's Domestic Water Service Area per the General Plan are similar to current land uses within the City. These primarily consist of residential uses with some commercial, light industrial, schools, and parks. Since development is proposed to continue as it has in the past, the use of population projections from **Section 3.03** is determined to be appropriate to estimate future water demands for water management planning purposes.

Section 4: Water Use Characterization

4.01 Past, Current, and Projected Water Use

California Water Code

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; (I) Agricultural (10631(d)(1) and (2)).

The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier (10631.1(a)).

Water uses within the Domestic Water service area for 2020 totaled 45,649 acre-feet. Past water use for the years 2016 through 2019 averaged about 40,500 acre-feet per year as shown in the City's validated AWWA Water Audit worksheets (see **Appendix H**). Total water use in 2020 was approximately 13 percent higher than the average total water use for the years 2016 through 2019.

The breakdown of 2020 water demands for the Domestic Water System service area by the water use sectors from the Water Code is provided in **Table 4-1 Retail**. Brief descriptions of the water use sectors within the City's Domestic Water System service area and included in **Table 4-1 Retail** are provided below.

- Single Family Residential — One lot with one dwelling unit that may include a detached secondary dwelling.
- Multi Family Residential — Multiple dwelling units contained within one building or several buildings within one complex.
- Commercial — Water users that provide or distribute a product or service.
- Industrial — Water users that are primarily a manufacturer or processor of materials or engaged in research and development.
- Institutional/Governmental — Water users dedicated to public service including schools, courts, churches, hospitals, parks, and other government facilities.
- Construction Water — Purchases of water by contractors for use in construction operations.

Table 4-1 Retail: Demands for Potable and Raw Water - Actual			
Use Type	2020 Actual		
	Additional Description	Level of Treatment When Delivered	Volume
Single Family Residential		Drinking Water	29,986
Multi-Family Residential		Drinking Water	1,534
Commercial		Drinking Water	6,904
Industrial		Drinking Water	314
Institutional/Governmental	Public Facilities	Drinking Water	3,527
Other	Construction Water	Drinking Water	250
Losses[1]		Drinking Water	3,134
TOTAL			**45,649**

NOTES:

1. The amount shown as losses is non-revenue water per the City's AWWA Water Audit worksheet for 2020 provided in **Appendix H**. Distribution system losses averaged approximately 4 percent for the years 2016 through 2020 based on the AWWA Water Audit worksheets in **Appendix H**.

The Wholesale Water System delivers Kern River water to surface water treatment plants for immediate use by the retail water systems. In addition, Kern River deliveries are also made to groundwater recharge facilities and recharged Kern River supplies are stored in the groundwater basin for future use. These supplies are pumped by the overlying retail water suppliers for use within their respective service areas. Deliveries of water during 2020 from the Wholesale Water System to retail water suppliers and for groundwater replenishment are summarized in **Table 4-1 Wholesale**.

Table 4-1 Wholesale: Demands[1] for Potable and Non-Potable Water - Actual			
Use Type	2020 Actual		
	Additional Description	Level of Treatment When Delivered	Volume
Sales to other agencies	Cal Water Northeast Treatment Plant	Raw Water	11,124
Sales to other agencies	Cal Water Northwest Treatment Plant	Raw Water	5,918
Other Potable	KCWA ID4 Henry C. Garnett Water Purification Plant	Raw Water	7,380
Groundwater recharge	River and Carrier Canal Recharge	Raw Water	53,106
TOTAL			**77,528**

NOTES:

1. This table shows actual deliveries of water to the various agencies and uses during 2020 and may not represent overall demands within the Wholesale Water System.

Table 4-2 Retail includes projections of the City's Domestic Water Service Area demands for the years 2025 through 2040 in five year increments. Projections for total future water demands are based on the projected

population data from **Table 3-1 Retail** and a potable water use of 253 gpcd (the 2020 daily per capita water use target for the City).

The percentage distribution of water demands among the various water use types was found to be nearly the same in 2020 as in 2015. Therefore, the percentage of water use for the various use types is anticipated to remain about the same in future years. Water demand projections by water use sector in **Table 4-2 Retail** are based on the percentage of total demands as follows:

- Single Family Residential – 67% of total demands
- Multi Family Residential – 3% of total demands
- Commercial – 16% of total demands
- Industrial – 1% of total demands
- Institutional/Governmental – 8% of total demands
- Construction Water – 1% of total demands
- Losses – 4% of total demands

Table 4-2 Retail: Demands for Potable and Raw Water - Projected

Use Type	Additional Description *(as needed)*	Projected Water Use			
		2025	2030	2035	2040
Single Family		33,627	36,764	40,194	43,944
Multi-Family		1,506	1,646	1,800	1,968
Commercial		8,030	8,780	9,598	10,494
Industrial		502	549	600	656
Institutional/Governmental	Public Facilities	4,015	4,390	4,799	5,247
Other	Construction Water	502	549	600	656
Losses		2,008	2,195	2,400	2,624
TOTAL		**50,190**	**54,873**	**59,991**	**65,589**

NOTES: Total projected water uses estimated using the 2020 Target of 253 GPCD for the City and population projections per Table 3-1 Retail. Percentage distribution among water use types based on historic averages.

Water demand projections for the City's Wholesale Water Service for the years 2025 through 2040 area are provided in **Table 4-2 Wholesale.** Deliveries to Cal Water treatment plants are based on projections from Cal Water. Projected deliveries to KCWA ID4 treatment plant and for groundwater replenishment are provided by City Water Resources staff.

Table 4-2 Wholesale: Demands for Potable and Raw Water - Projected					
Use Type	Additional Description	Projected Water Use			
		2025	2030	2035	2040
Sales to other agencies	Cal Water Northeast Treatment Plant	22,400	44,800	44,800	44,800
Sales to other agencies	Cal Water Northwest Treatment Plant	9,000	9,000	9,000	9,000
Other Potable	KCWA ID4 Henry C. Garnett Water Purification Plant	6,500	6,500	6,500	6,500
Groundwater recharge	River and Carrier Canal Recharge, 2800 Acre Banking, and other City Facilities	62,100	39,700	39,700	39,700
TOTAL		**100,000**	**100,000**	**100,000**	**100,000**
NOTES:					

Table 4-3 Retail and **Table 4-3 Wholesale** summarize the City's total water demands from **Tables 4-1 and 4-2 Retail and Wholesale** respectively. Recycled water demands are discussed in **Section 6.05**.

Table 4-3 Retail: Total Water Demands					
Description	2020	2025	2030	2035	2040
Potable and Raw Water *From Tables 4-1 and 4-2*	45,649	50,190	54,873	59,991	65,589
Recycled Water Demand *From Table 6-4*	664	2,240	8,961	8,961	8,961
TOTAL WATER DEMAND	**46,313**	**52,430**	**63,834**	**68,952**	**74,550**
NOTES:					

Table 4-3 Wholesale: Total Water Demands					
Description	2020	2025	2030	2035	2040
Potable and Raw Water *From Tables 4-1 and 4-2*	77,528	100,000	100,000	100,000	100,000
Recycled Water Demand *From Table 6-4*	0	0	0	0	0
TOTAL WATER DEMAND	**77,528**	**100,000**	**100,000**	**100,000**	**100,000**
NOTES: The Wholesale Water System does not distribute recycled water.					

4.02 Distribution System Water Losses

California Water Code

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:. . . (J) Distribution system water loss. (10631(d)(1) and (2)).

The distribution system water loss shall be quantified for each of the five years preceding the plan update in accordance with rules adopted pursuant to Section 10608.34.

The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34 (10631(d)(3)).

Table 4-4 presents the results of the City's water system audits for the years 2016 through 2020. The audits were completed according to Appendix L of the Guidebook using the AWWA's Water Audit Software. A copy of the City's water audit reporting worksheets for 2016 through 2020 are included in **Appendix H**. AWWA water loss audit reporting is not required for the Wholesale Water Service Area. Therefore, Table 4-4 is not provided for the wholesale system.

Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss
01/2016	1,180
01/2017	2,758
01/2018	-964
01/2019	2,277
01/2020	3,028

NOTES:
Taken from the field "Water Losses" from the AWWA Water Audit Reporting Worksheets (see Appendix H)

4.03 Water Use for Lower Income Households

California Water Code

The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier (10631.1(a)).

. . . Water use projections that do not account for these water savings shall be noted of that fact (10631 (e)(4)(B)).

The water use projections for the City's Domestic Water Service Area have not been adjusted to account for future water savings from codes, standards, ordinances, or transportation and land use plans. Future projections are based on the projected average per capita water usage of 253 gpcd and the population projections from **Table 3-1 Retail**. Lower income water demands are included in the water demand projections for the City's Domestic Water Service Area and are estimated to comprise approximately 3 percent of the City's retail service area demands. See **Table 4-5 Retail.**

Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	No
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

4.04 Climate Change Considerations

California Water Code

It is the intention of the Legislature, in enacting this part, to permit levels of water management planning … while accounting for impacts of climate change (10630).

Climate Change impacts were modeled for the Kern River Groundwater Sustainability Area Groundwater Sustainability Plan (KRGSA GSP). Considerations included increases in water demands using DWR climate change factors and guidance. The City's projected per capita water usage of 253 gpd is expected to adequately address climate change impacts to urban water demands during the period covered by this UWMP. Discussion of the potential climate change impacts to water supplies is included in **Section 6.10**.

Section 5: SB X7-7 Baselines, Targets, and 2020 Compliance

This section addresses the City Domestic Water System's compliance with 2020 per capita water use targets established in accordance with SB X7-7. Baselines and targets were adopted as a part of the 2010 UWMP and updated in the 2015 UWMP utilizing the baseline period of 1995-2004. Compliance with SB X7-7 is not required for the Wholesale Water System. The SB X7-7 Compliance form for the Domestic Water System is included in **Appendix G**. The SB X7-7 Verification tables from the 2015 UWMP are also included in **Appendix G** for reference.

5.01 2020 Service Area Population

California Water Code

> *When calculating per capita values for the purposes of this chapter, an urban water retailer shall determine population using federal, state, and local population reports and projections (10608.20(f)).*

The 2020 population estimate for the Domestic Water System Service Area was determined using population per residential connection data from the DWR Population Tool for census years 1990, 2000, and 2010 and the number of residential connections for 2020. Projecting the population per residential connection trend generates an estimate of 3.59 persons per residential connection for 2020. Multiplying 3.59 persons per residential connection by the 45,120 residential connections within the Domestic Water Service Area in 2020 results in an estimated population of about 161,980 as shown in **Table 3-1 Retail**.

5.02 2020 Gross Water Use

California Water Code

> *"Gross Water Use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:*
>
> 1) *Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier*
> 2) *The net volume of water that the urban retail water supplier places into long term storage*
> 3) *The volume of water the urban retail water supplier conveys for use by another urban water supplier*
> 4) *The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24 (10608.12(g)).*

The 2020 gross water use for the Domestic Water System is 45,649 acre-feet as shown in **Table 4-1 Retail**.

5.03 2020 Target

The baseline and target information for the City's Domestic Water System is summarized in **Table 5-1**.

Table 5-1 Baselines and Targets Summary From SBX7-7 Verification Form
Retail Only

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	*1995*	*2004*	*316*	*253*
5 Year	*2006*	*2010*	*312*	
*All values are in Gallons per Capita per Day (GPCD)				
NOTES: See SB X7-7 Verification tables in Appendix G.				

5.04 2020 Compliance Daily Per Capita Water Use

California Water Code

> *"Compliance daily per capita water use" means the gross water use during the final year of the reporting period (10608.12(f)).*
>
> *Each urban retail water supplier shall meet its urban water use target by December 31, 2020 (10608.24(a)).*

Actual 2020 water use was slightly lower than the Confirmed 2020 Target water use. However, the City likely experienced additional water use due to stay-at-home orders issued by the State in response to the COVID-19 pandemic. Many college students returned to their parents' homes and employees were working remotely for six months or longer. Travel outside of the area was greatly reduced. As noted in **Section 4.01**, total water use for 2020 was an increase of approximately 13% from the average total water use for the years 2016 through 2019.

Table 2:5-2: 2020 Compliance From SBX7-7 Compliance Form
*Retail Only**

Actual 2020 GPCD	2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020? Y/N
252	253	Yes
All values are in Gallons per Capita per Day (GPCD)		
NOTES: See SB X7-7 Compliance form in Appendix G.		

Section 6: Water Supply Characterization

California Water Code

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information including all of the following:

(1) A detailed discussion of anticipated supply availability under a normal year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change. (10631 (b))

The City's Domestic Water System utilizes groundwater supplies and treated surface water. Surface water from the Kern River is the source for the Wholesale Water System. Details on the City's various water supply sources are provided below.

6.01 Purchased or Imported Water

The City's surface water supplies are described in **Section 6.03**. The City does not use other purchased or imported water supplies.

6.02 Groundwater

California Water Code

If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records. (10631(b)(4))

The City pumps groundwater and recharged surface water from the Kern County Subbasin of the San Joaquin Valley Groundwater Basin (Groundwater Basin No. 5-22.14) which is currently non-adjudicated. The Kern County Subbasin is designated as critically overdrafted and identified as a high-priority basin in the latest version of Bulletin 118 published by the DWR. The City is a member of the Kern River Groundwater Sustainability Agency (KRGSA) which covers approximately 361 square miles overlying the Kern County Subbasin. Other member agencies include Kern Delta Water District, KCWA's ID4, North of the River Municipal Water District/Oildale Mutual Water Company, and East Niles Community Services District. The KRGSA was formed in compliance with the Sustainable Groundwater Management Act (SGMA) to cooperatively manage local groundwater in a sustainable manner. The KRGSA adopted its Final Groundwater Sustainability Plan (GSP) in January 2020. The KRGSA GSP was submitted to the DWR in coordination with four other GSPs that together cover the entire 2,834 square mile Subbasin.

The KRGSA GSP identifies management actions and proposes projects to maintain the groundwater resource in a sustainable condition under future climate change conditions for the next 50 years. A discussion of the projects to be implemented by the City is included in **Section 6.08**. With implementation of the actions in the KRGSA GSP, the City's groundwater and recharged surface water supplies are anticipated to be sufficient to meet its demands for the next 50 years. The City's groundwater operations are subject to conformance with the requirements of the KRGSA GSP.

Kern River water supplies are recharged to the groundwater basin by the Wholesale Water System for the benefit of retail water suppliers throughout the City, including the City's Domestic Water System. Historic groundwater and recharged surface water pumping volumes within the Domestic Water System service area for the years 2016 through 2020 are provided in **Table 6-1 Retail**. The Wholesale Water System does not pump groundwater. Therefore, **Table 6-1 Wholesale** does not apply and is not included in this UWMP.

Table 6-1 Retail: Groundwater Volume Pumped

Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	Kern County Subbasin	30,414	30,108	29,812	29,733	34,107
TOTAL		**30,414**	**30,108**	**29,812**	**29,733**	**34,107**
NOTES:						

The Domestic Water System has sufficient redundancy to allow for wells and other facilities to be taken offline as needed for maintenance or repairs. The City has installed standby generators at its well facilities so that it can continue to provide water supply in the event of an electrical power outage. Wellhead groundwater treatment facilities have been installed where necessary in order to continue providing water supplies that meet current potable water standards.

6.03 Surface Water

The Domestic Water System receives treated surface water supplies from Cal Water's North Garden (Northwest) Treatment Plant and Kern County Water Agency ID4's Henry C. Garnett Water Purification Plant. The Wholesale Water System provides Kern River supplies to the Cal Water Northwest Treatment Plant. The Henry C. Garnett Water Purification Plant treats SWP supplies When SWP supplies are not

available from KCWA's ID4, the City is able to deliver its Kern River supplies to KCWA's ID4 for treatment in place of SWP supplies.

The Wholesale Water System provides groundwater recharge of Kern River water supplies both by transportation through the Kern River and unlined portions of City canals, including the Carrier Canal, and within groundwater replenishment areas such as the City's 2800 Acres recharge facility, Truxtun Lakes, Aera Park, and the Park at Riverwalk. The Environmental Impact Report (EIR) for the Kern River Flow and Municipal Water Program estimated the City's Kern River water supplies for both urban use and agricultural use to average about 135,000 acre-feet per year (see **Appendix D**). Approximately 100,000 acre-feet of the 135,000 acre-feet is designated for urban use The City has storage rights in Lake Isabella that allows for flexibility in the management of its Kern River supplies.

6.04 Stormwater

The City maintains almost 400 stormwater basins that capture precipitation and recharge the groundwater basin. These stormwater basins are estimated to capture and recharge approximately 16,000 AF/year of stormwater runoff on average[2]. Approximately 4,272 AF/year of additional stormwater runoff is estimated to be captured and diverted into the Kern River and unlined canals on an average annual basis[3]. This captured stormwater becomes part of the City's groundwater and recharged water supplies as described in **Section 6.02**.

6.05 Wastewater and Recycled Water

California Water Code

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include the following:

a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

[2] Per Section 3.2.4.1 of the Final Draft KRGSA GSP

[3] Per Section 4.2.5 of the Final Draft KRGSA GSP

f) *A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*

g) *A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use. (16033)*

Wastewater generated within the Domestic Water System service area is collected and transported to the City's WWTP No. 3 which provides undisinfected secondary and tertiary treatment. Undisinfected secondary effluent is stored in percolation ponds and used for agricultural irrigation. Tertiary treated effluent is used for landscape irrigation on City owned property. Wastewater treatment and disposal is not applicable to the Wholesale Water System.

WWTP No. 3 serves areas located both within and outside of the Domestic Water System service area. The wastewater volume generated within the Domestic Water System service area during 2020 is estimated as 30% of the total water demand per **Table 4-1 Retail**. Wastewater collected from within the Domestic Water System service area in 2020 is summarized in **Table 6-2 Retail.**

Table 6-2 Retail: Wastewater Collected Within Service Area in 2020

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2020[1]	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Bakersfield	Estimated	13,695	City of Bakersfield	WWTP No. 3	Yes	No
Total Wastewater Collected from Service Area in 2020[1]:		**13,695**				

NOTES:

1. Volume of wastewater generated within the Domestic Water System service area is estimated as 30% of the total 2020 water use of 45,649 acre-feet per Table 4-1 Retail.

A summary of the total wastewater treated at and discharged from WWTP No. 3 for 2020, including wastewater generated both within and outside of the Domestic Water System service area, is provided in **Table 6-3 Retail.**

Approximately 7,114 acre-feet of undisinfected secondary effluent was delivered for agricultural irrigation use outside of the service area on property owned by the City of Los Angeles. Approximately 12,167 acre-feet of undisinfected secondary effluent was disposed of in percolation ponds at the WWTP. Approximately 664 acre-feet of tertiary treated effluent was delivered as recycled water for irrigation of landscaping within the Kaiser Permanente Sports Village, a City owned soccer and football complex located within the Domestic Water System service area.

The Wholesale Water System neither distributes nor provides supplemental treatment to recycled water. Therefore, **Table 6-3 Wholesale** does not apply and is not included in this UWMP.

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020						
Discharge Location Description	Method of Disposal	Treatment Level	2020 volumes[1]			
			Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
LA Farms	Land disposal	Secondary, Undisinfected	7,114	0	0	7,114
WWTP Ponds	Percolation ponds	Secondary, Undisinfected	12,167	12,167	0	0
Sports Village	Land disposal	Tertiary	664	0	664	0
Total			**19,945**	**12,167**	**664**	**7,114**
NOTES: 1. 2020 wastewater volumes include wastewater generated outside of the City's Domestic Water Service Area.						

On July 17, 2019, the City Council voted not to renew its contract for sale of wastewater for agricultural irrigation use on the farmland owned by the City of Los Angeles when it expires in 2026. This will allow for additional recycled water to be used within the Domestic Water System service area in the future. The City is also planning an expansion of the tertiary treatment capacity at WWTP No. 3 from 2 MGD to 8 MGD. A feasibility study is planned for fiscal year 2021-22 to evaluate options for use of the additional tertiary treated recycled water including expansion of the landscape irrigation system and indirect potable recharge.

Current and projected use of recycled water is summarized in **Table 6-4 Retail**. The comparison of 2020 actual recycled water use to that projected in the 2015 UWMP is included in **Table 6-5 Retail**. Potential projects to expand recycled water use are summarized in **Table 6-6 Retail**. **Table 6-4 Wholesale** and **Table 6-5 Wholesale** do not apply and are not included in this UWMP.

Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area							
Name of Agency Producing (Treating) the Recycled Water:		City of Bakersfield					
Name of Agency Operating the Recycled Water Distribution System:		City of Bakersfield					
Beneficial Use Type	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040
Landscape Irrigation	Sports Village	Tertiary	664	2,240	8,961	8,961	8,961
Total:			**664**	**2,240**	**8,961**	**8,961**	**8,961**
NOTES: Expansion of tertiary treatment at WWTP No. 3 to 8 MGD is projected to be implemented by 2030.							

Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
Direct Use	2015 Projection for 2020	2020 actual use[1]
Landscape irrigation at Sports Village	2,240	664
Total	**2,240**	**664**
NOTES: 1. Planned expansion of tertiary treatment capacity at WWTP 3 and increase in landscape irrigation at the Sports Village complex did not occur.		

Table 6-6 Retail: Methods to Expand Future Recycled Water Use		
Name of Action/Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Expansion of Tertiary Treatment at WWTP No. 3	2030	8,297 AF/yr
Total		**8,297 AF/yr**
NOTES: Expected increase in recycled water use is the difference between projected 2030 use and actual 2020 use.		

6.06 Desalinated Water Opportunities

California Water Code

Describe the opportunities for development of desalinated water, including but not limited to ocean water, brackish water, and groundwater, as a long-term supply. (10631(g))

The City has no plans for the development of desalinated water supplies within the planning horizon of this UWMP. The City is not located near sources of ocean water or brackish groundwater. Desalination is not a feasible solution for its water supply needs.

6.07 Exchanges and Transfers

California Water Code

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis. (10631(c))

The Domestic Water System and the Wholesale Water System does not typically or routinely participate in short-term or long-term water exchanges or transfer programs.

6.08 Future Water Projects

California Water Code

Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program (10631(f)).

6.08.1 Kern River Conjunctive Use Optimization

Optimization of the City's Kern River supplies is identified as a Phase One project in the KRGSA GSP. The project is described in Section 7.1.2 of the KRGSA GSP and involves the full use of the City's available Kern River entitlement. This project is proposed to be implemented over time so that it can be adjusted as needed to meet changing conditions. The City's Kern River supplies will be delivered as a first priority to meet demands of the surface water treatment plants with the remaining supplies being recharged to the groundwater basin through the Kern River channel, the 2800 Acres recharge facility, and other City facilities.

Additional Kern River supplies may become available to the City through an Application to Appropriate Water filed with the California State Water Resources Control Board (SWRCB). The Kern River was designated with Fully Appropriated Status (FAS) by the SWRCB in 1964. However, in February 2010, SWRCB issued an order revising the status of the Kern River, finding that the river was no longer fully appropriated. In anticipation of this action, the City filed an application with the SWRCB to obtain rights to the surplus, unappropriated, and available water in the Kern River.

The City's intended use of unappropriated water is to have it remain in the Kern River watercourse to support multiple reasonable and beneficial uses, including domestic purposes, municipal and industrial uses, protection of the public interest, environmental purposes, streamflow restoration, constructed wetlands, recreational uses, fish and wildlife restoration, underground aquifer supply, aquifer water quality enhancement, and underground water banking for drought and other emergencies. The SWRCB has not taken action regarding the allocation of surplus, unappropriated Kern River supplies. It is anticipated that this water may be allocated in about 10 to 15 years. If additional Kern River supplies are allocated to the City, they would become a part of the conjunctive use optimization project.

6.08.2 Expand Recycled Water Use

As discussed in **Section 6.05,** the City will not renew its contract for the use of treated wastewater effluent on property located outside of its boundaries. This will increase the availability for use of this water within the City's service areas. The City is also planning the expansion of its tertiary treatment facilities at WWTP No. 3 from 2 MGD to 8 MGD which will result in an increase in recycled water supplies.

The City's Expanded Recycled Water Use Project is further described in Section 7.1.3 of the KRGSA GSP and is summarized in **Table 6-7 Retail.**

Table 6-7 Retail: Expected Future Water Supply Projects or Programs					
Name of Future Projects or Programs	Joint Project with other agencies?	Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
WWTP No. 3 Tertiary Treatment Expansion	No	Expand tertiary treatment from 2 MGD to 8 MGD	2030	All year types	8,297
NOTES: Expected increase from 2020 average use.					

6.09 Summary of Existing and Planned Sources of Water

California Water Code

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following…

(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies. (10631 (b))

A detailed description and analysis of the amount, and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (10631(b)(4)(D)).

The Domestic Water System service area relies significantly on pumping of groundwater and recharged surface water supplies to meet its demands. With implementation of the projects and actions identified in the KRGSA GSP, the City's groundwater and recharged surface water supplies are anticipated to be sustainable and available to meet the projected demands of its service area for the next 50 years. The KRGSA GSP includes implementation of the City's conjunctive use optimization project (per Section 7.1.2 of the KRGSA GSP) and proposed expansion of its recycled water use (per Section 7.1.3 of the KRGSA GSP) which will provide additional water supplies for the benefit of the groundwater basin. Purchases of treated surface water supplies from Cal Water Northwest Treatment Plant (treated Kern River supplies) and Henry C. Garnett Water Purification Plant (treated SWP supplies from KCWA ID4) are expected to be available to meet demands as projected in this Plan. When SWP supplies are not available from KCWA's ID4, the City is able to deliver Kern River supplies to KCWA's ID4 for treatment in place of SWP supplies.

Actual supplies for 2020 for the Domestic Water System service area are summarized in **Tables 6-8 Retail.** Projections for water supplies are provided in **Table 6-9 Retail**. Projections of groundwater and recharged water pumping are estimated as the difference between the projected demands from **Table 4-2 Retail** and estimated purchases of treated surface water supplies.

Table 6-8 Retail: Water Supplies — Actual			
Water Supply Source	Additional Detail on Water Supply	2020	
		Actual Volume	Water Quality
Groundwater (not desalinated)	City Wells	34,107	Drinking Water
Surface Water (not desalinated)	Cal Water Northwest Treatment Plant	2,872	Drinking Water
Surface Water (not desalinated)	Henry C. Garnett Water Purification Plant	8,670	Drinking Water
Recycled Water	WWTP No. 3 Tertiary	664	Recycled Water
Total		**46,313**	
NOTES:			

Table 6-9 Retail: Water Supplies — Projected					
Water Supply Source	Additional Detail on Water Supply	Projected Water Supply *Reasonably Available Volume*			
		2025	2030	2035	2040
Groundwater (not desalinated)	City Wells	39,190	43,873	48,991	54,589
Surface Water (not desalinated)	Cal Water Northwest Treatment Plant	4,500	4,500	4,500	4,500
Surface Water (not desalinated)	Henry C. Garnett Water Purification Plant	6,500	6,500	6,500	6,500
Recycled Water	WWTP No. 3 Tertiary	2,240	8,961	8,961	8,961
Total		**52,430**	**63,834**	**68,952**	**74,550**
NOTES:					

Actual Kern River deliveries to the Wholesale Water System in 2020 are provided in **Table 6-8 Wholesale**. The projections of available Kern River water supplies for the Wholesale Water System shown in **Table 6-9 Wholesale** are based on the average historic City water yield per the EIR for the Kern River Flow and Municipal Water Program (see **Appendix D**) less agricultural deliveries and evaporation losses. The City's Kern River deliveries are replenished to the groundwater basin for the benefit of retail water suppliers providing service to City areas through their respective groundwater wells.

Table 6-8 Wholesale: Water Supplies — Actual			
Water Supply Source	Additional Detail on Water Supply	2020	
		Actual Volume	Water Quality
Surface Water (not desalinated)	Kern River Supply	77,528	Other Non-Potable Water
Total		**77,528**	
NOTES:			

Table 6-9 Wholesale: Water Supplies — Projected					
Water Supply Source	Additional Detail on Water Supply	**Projected Water Supply** *Reasonably Available Volume*			
		2025	**2030**	**2035**	**2040**
Surface Water (not desalinated)	Kern River Supply	100,000	100,000	100,000	100,000
Total		**100,000**	**100,000**	**100,000**	**100,000**
NOTES:					

6.10 Special Conditions – Climate Change Effects, Regulatory Conditions, and Project Development

As noted in **Section 4.04**, climate change impacts were modeled as a part of the KRGSA GSP. DWR climate change guidance referenced in the KRGSA GSP indicates that a change in timing of Kern River flows is anticipated, with more flows in the winter and early spring and less in the summer. However, the total Kern River flow volume is not expected to change significantly. Section 4.7 Projected Water Budgets from the KRGSA GSP is included as **Appendix C**. Conclusions from the climate change discussion in the KRGSA GSP are summarized as follows:

- Projected climate change impacts to total annual Kern River flow volumes are less than one percent.
- The change in timing of flows can be managed by KRGSA diverters for optimal Kern River use.
- Appropriate projects and management actions will be developed and implemented as a part of the GSP to maintain sustainable groundwater supplies for the KRGSA.

Discussions regarding regulatory conditions and project development are included in previous sections of the Plan.

6.11 Energy Use

California Water Code

In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate (10631.2(a)).

The estimated energy used to extract, divert, convey, treat, and distribute water for the City's Domestic Water System was determined from the energy utility invoices received during 2020 for its various water system facilities. The City does not use significant amounts of self-generated energy in its Domestic Water System. Energy is used primarily for groundwater wells and booster pumps. Data is not readily available to provide separate estimates of the amount of energy used for each component of the City's domestic water system operations or to determine the amount used for treated water supplies in comparison to the amount used for nontreated water supplies.

The Domestic Water System's estimated energy intensity for 2020 is calculated based on the Total Utility Approach as described in Appendix O of the Guidebook and shown in **Table O-1B**. The estimated energy use of 21,056,732 kilowatt-hours (kWh) for 2020 does not include recycled and wastewater related energy use. Therefore, the volume of water entering the process is the total domestic water use of 45,649 AF from **Table 4-1 Retail**.

Table O-1B: Recommended Energy Reporting - Total Utility Approach

Reporting Period	2020	**Urban Water Supplier Operational Control Sum of All Water Management Processes Total Utility**
Volume of Water Entering Process (AF)		*45,649*
Energy Consumed (kWh)		*21,056,732*
Energy Intensity (kWh/vol. converted to MG)		*1,415.6*

Section 7: Water Service Reliability and Drought Risk Assessment

7.01 Water Service Reliability Assessment

California Water Code

> *Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier (10635(a)).*
>
> *A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change (10631(b)(1)).*

The City anticipates that its sources of supplies will be available to meet demands on a consistent basis for all year types throughout the planning horizon of this UWMP. The City's Wholesale Water System replenishes its Kern River supplies to the groundwater basin for the benefit of retail water suppliers providing service to City areas through their respective groundwater wells. The KRGSA GSP includes implementation or projects and management actions including the City's conjunctive use optimization project and proposed expansion of its recycled water use which are anticipated to provide additional water supplies for the benefit of the groundwater basin. The City and other retail water suppliers within the Wholesale Water System service area are able to increase use of their groundwater wells during years of reduced Kern River supplies.

The Domestic Water System service area relies significantly on pumping of groundwater and recharged surface water supplies to meet its demands. With implementation of the projects and management actions identified in the KRGSA GSP, the City's groundwater and recharged surface water supplies are anticipated to be sustainable and available to meet the projected demands of its Domestic Water System service area. The KRGSA GSP identifies sustainable management criteria for water levels based on the historic low water levels experienced in 2015-2016. Maintaining water levels above the Minimum Threshold levels identified in the KRGSA GSP is anticipated to allow the City's wells to meet the demands of the Domestic Water System while minimizing undesirable results such as declining pump capacity, well inefficiency, water levels falling below pump intakes and pump screens, and degraded water quality.

As population and water demands increase with the Domestic Water System service area, the City will construct the new wells required to meet the increased demands. Groundwater wells will be equipped with wellhead treatment as necessary to remove contaminants such as arsenic and 1,2,3-Trichloropropane that exceed water quality standards. When SWP supplies are not available from KCWA ID4, the City is able to deliver its Kern River supplies to KCWA's ID4 for treatment in place of SWP supplies.

The anticipated reliability of the City's water supplies to meet the needs of the Domestic Water System service area for the various water year types is summarized in **Table 7-1 Retail**. The recent dry period of 2012 through 2016 is shown as the basis of water year data for the multiple dry year scenarios with 2015 shown as the basis of water year data for the single dry year.

Table 7-1 Retail: Basis of Water Year Data

Year Type	Base Year	Available Supplies if Year Type Repeats
		% of Average Supply
Average Year	Base Year	100%
Single-Dry Year	2015	100%
Multiple-Dry Years 1st Year	2012	100%
Multiple-Dry Years 2nd Year	2013	100%
Multiple-Dry Years 3rd Year	2014	100%
Multiple-Dry Years 4th Year	2015	100%
Multiple-Dry Years 5th Year	2016	100%

NOTES: The City relies significantly on groundwater pumping to meet its demands. It is anticipated that the City can provide 100% of average supplies in every year.

The City's Wholesale Water System has contractual stages of action for delivering water to Cal Water during critically dry years. Representatives of the City's Wholesale Water System and Cal Water meet, and mutually agree, as to when a "critically" dry year is occurring, or is about to occur, and the extent to which reductions and restrictions in the quantity of water delivered to the Cal Water treatment plant will be made.

The recent dry period of 2012 through 2016 is shown as the basis of water year data for the multiple dry year scenarios with 2015 shown as the basis of water year data for the single dry year. The actual Kern River deliveries for the Wholesale Water System for the single dry year and multiple dry year scenarios are provided in **Table 7-1 Wholesale**.

Table 7-1 Wholesale: Basis of Water Year Data

Year Type	Base Year	Available supplies if year type repeats	
		Volume available	% of avg supply
Average Year[1]	Average	100,000	100%
Single-Dry Year	2015	14,079	14%
Multiple-Dry Years 1st Year	2012	32,092	32%
Multiple-Dry Years 2nd Year	2013	22,245	22%
Multiple-Dry Years 3rd Year	2014	18,061	18%
Multiple-Dry Years 4th Year	2015	14,079	14%
Multiple-Dry Years 5th Year	2016	32,001	32%

NOTES:

1. Based on the average historic City water yield per the EIR for the Kern River Flow and Municipal Water Program (see Appendix D) less agricultural deliveries and evaporation losses.

A comparison of the Domestic Water System service area's normal year supply totals from **Table 6-9 Retail** and normal year demand totals from **Table 4-3 Retail** is provided in **Table 7-2 Retail**. A comparison of the Wholesale Water System's normal year supply totals from **Table 6-9 Wholesale** and normal year demand totals from **Table 4-3 Wholesale** is provided in **Table 7-2 Wholesale**.

Table 7-2 Retail: Normal Year Supply and Demand Comparison

Description	2025	2030	2035	2040
Supply totals *(from Table 6-9 Retail)*	52,430	63,834	68,952	74,550
Demand totals *(from Table 4-3 Retail)*	52,430	63,834	68,952	74,550
Difference	0	0	0	0
NOTES:				

Table 7-2 Wholesale: Normal Year Supply and Demand Comparison

Description	2025	2030	2035	2040
Supply totals *(from Table 6-9 Wholesale)*	100,000	100,000	100,000	100,000
Demand totals *(from Table 4-3 Wholesale)*	100,000	100,000	100,000	100,000
Difference	0	0	0	0
NOTES:				

The City anticipates having no reduction in its available water supplies for the Domestic Water System service area during the single dry year scenario. Its supplies are projected to be adequate to meet demands in future years. A comparison of the Domestic Water System service area's supply and demand projections for the single dry year scenario is shown in **Table 7-3 Retail**. Since groundwater pumping is limited to the amount needed to meet demands, the demands are shown to be equal to supplies. Recycled water supplies and the corresponding landscape irrigation demands are not included in **Table 7-3 Retail** as these do not impact dry year water supply planning for the Domestic Water System.

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison

Description	2025	2030	2035	2040
Supply totals	50,190	54,873	59,991	65,589
Demand totals	50,190	54,873	59,991	65,589
Difference	0	0	0	0
NOTES: Supplies and demands do not include recycled water.				

The comparison of the Domestic Water System's projected water supplies and demands for the required five-year multiple dry years scenario is provided in **Table 7-4 Retail**. Although the City anticipates no reduction in its available supplies, it is assumed that water supplies and water demands are reduced by 10 percent in the second dry year and by 15 percent in the third through fifth dry years as a result of water conservation measures expected to be implemented during an extended drought period. Since groundwater pumping is limited to the amount needed to meet demands, the demands are shown to be equal to supplies in each year. Recycled water supplies and the corresponding landscape irrigation demands are not included in **Table 7-4 Retail** as these do not impact dry year water supply planning for the Domestic Water System.

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison

Description		2025	2030	2035	2040
First year	Supply totals	50,190	54,873	59,991	65,589
	Demand totals	50,190	54,873	59,991	65,589
	Difference	0	0	0	0
Second year	Supply totals	45,171	49,386	53,992	59,030
	Demand totals	45,171	49,386	53,992	59,030
	Difference	0	0	0	0
Third year	Supply totals	42,662	46,642	50,992	55,751
	Demand totals	42,662	46,642	50,992	55,751
	Difference	0	0	0	0
Fourth year	Supply totals	42,662	46,642	50,992	55,751
	Demand totals	42,662	46,642	50,992	55,751
	Difference	0	0	0	0
Fifth year	Supply totals	42,662	46,642	50,992	55,751
	Demand totals	42,662	46,642	50,992	55,751
	Difference	0	0	0	0

NOTES: Assumes that supplies and demands are reduced by 10% in the second dry year and by 15% in the third through fifth dry years as a result of water conservation measures expected to be implemented. Supplies and demands do not include recycled water.

The Wholesale Water System replenishes its Kern River supplies to the groundwater basin for the benefit of retail water suppliers providing service to City areas through their respective groundwater wells. Water supplies are stored within the groundwater basin in wet years and extracted by the various retail water agencies to meet their demands when surface water supplies are reduced. The comparison of projected demands within the Wholesale Water System service area and available surface water supplies for the single dry year scenario are provided in **Table 7-3 Wholesale**.

Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison				
Description	2025	2030	2035	2040
Supply totals[1]	14,079	14,079	14,079	14,079
Demand totals[2]	100,000	100,000	100,000	100,000
Difference[3]	(85,921)	(85,921)	(85,921)	(85,921)

NOTES:

1. Supply totals from Table 7-1 Wholesale.
2. Demands totals are from Table 4-3 Wholesale and include groundwater recharge.
3. Kern River water supplies are replenished in wet years and stored within the groundwater basin for extraction by the various retail water suppliers during periods of reduced surface water supplies.

The comparison of projected demands within the Wholesale Water System service area and available surface water supplies for the multiple dry year scenarios are provided in **Table 7-4 Wholesale**.

Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison					
Description		2025	2030	2035	2040
First year	Supply totals[1]	32,092	32,092	32,092	32,092
	Demand totals[2]	100,000	100,000	100,000	100,000
	Difference[3]	(67,908)	(67,908)	(67,908)	(67,908)
Second year	Supply totals[1]	22,245	22,245	22,245	22,245
	Demand totals[2]	100,000	100,000	100,000	100,000
	Difference[3]	(77,755)	(77,755)	(77,755)	(77,755)
Third year	Supply totals[1]	18,061	18,061	18,061	18,061
	Demand totals[2]	100,000	100,000	100,000	100,000
	Difference[3]	(81,939)	(81,939)	(81,939)	(81,939)
Fourth year	Supply totals[1]	14,079	14,079	14,079	14,079
	Demand totals[2]	100,000	100,000	100,000	100,000
	Difference[3]	(85,921)	(85,921)	(85,921)	(85,921)
Fifth year	Supply totals[1]	32,001	32,001	32,001	32,001
	Demand totals[2]	100,000	100,000	100,000	100,000
	Difference[3]	(67,999)	(67,999)	(67,999)	(67,999)

NOTES:

1. Supply totals from Table 7-1 Wholesale.
2. Demands totals are from Table 4-3 Wholesale and include groundwater recharge.
3. Kern River water supplies are replenished in wet years and stored within the groundwater basin for extraction by the various retail water suppliers during periods of reduced surface water supplies.

7.02 Description of Management Tools and Options

California Water Code

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions (10620(f)).

The tools and options used by the City to maximize resources and minimize the need to import water from other regions include the following, which are described more fully in other sections of the Plan.

- Implementation of the Kern River Conjunctive Use Optimization project (**Section 6.08.1**)
- Expansion of recycled water use (**Section 6.08.2**)
- Continuing efforts regarding water conservation and demand management (**Section 9**)

7.03 Drought Risk Assessment

California Water Code

Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria (10635(b)).

The water supplies for the Domestic Water System are projected to be adequate to meet demands during the years of the Drought Risk Assessment. The City's Kern River supplies have been replenished to the groundwater basin and provide reliability of groundwater supplies for a five-year drought. When SWP supplies are not available from KCWA's ID4, the City is able to deliver its Kern River water to KCWA's ID4 for treatment in place of SWP supplies. The Five-Year Drought Risk Assessment for the Domestic Water System is presented in **Table 7-5 Retail**.

Although the City anticipates no reduction in its available supplies, it is assumed that water supplies and water demands are reduced by 10 percent in the second dry year and by 15 percent in the third through fifth

dry years as a result of water conservation measures expected to be implemented during an extended drought period. Since groundwater pumping is limited to the amount needed to meet demands, the demands are shown to be equal to supplies for 2021. In years 2022 through 2025, the reduction in demands will be accomplished by implementation of appropriate measures from the Water Shortage Contingency Plan (See **Section 8**). Recycled water supplies and the corresponding landscape irrigation use are not included in **Table 7-5 Retail** as these do not impact dry year water supply planning for the Domestic Water System.

Table 7-5 Retail: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	Total
Total Water Use	46,734
Total Supplies	46,734
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	0
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	0%
2022	Total
Total Water Use	47,575
Total Supplies	42,818
Surplus/Shortfall w/o WSCP Action	(4,757)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	4,757
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	10%
2023	Total
Total Water Use	48,432
Total Supplies	41,167
Surplus/Shortfall w/o WSCP Action	(7,265)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	7,265
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	15%

2024	Total
Total Water Use	49,303
Total Supplies	41,908
Surplus/Shortfall w/o WSCP Action	(7,395)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	7,395
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	15%
2025	Total
Total Water Use	50,190
Total Supplies	42,662
Surplus/Shortfall w/o WSCP Action	(7,528)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	7,528
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	15%

The Five-Year Drought Risk Assessment for the Wholesale Water System is presented in **Table 7-5 Wholesale.** Water supplies are based on the five year drought period from **Table 7-1 Wholesale.** The Wholesale Water System demand of 100,000 AF annually includes water supplies used for groundwater recharge. Total water use in **Table 7-5 Wholesale** is shown to be equal to total supplies in each year since the Wholesale Water System replenishes its Kern River supplies to the groundwater basin for the benefit of retail water suppliers providing service to City areas through their respective groundwater wells. Water supplies are stored within the groundwater basin in wet years and extracted by the various retail water agencies to meet their demands when surface water supplies are reduced. Wholesale Water System groundwater recharge in future drought years will be reduced to match available supplies. Demands within the retail water agencies are also anticipated to be reduced due to implementation of measures from their respective Water Shortage Contingency Plans (see **Section 8** for information on the City's WSCP).

Table 7-5 Wholesale: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

2021	Total
Total Water Use	32,092
Total Supplies	32,092
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	0
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	0%

2022	Total
Total Water Use	22,245
Total Supplies	22,245
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	0
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	0%
2023	Total
Total Water Use	18,061
Total Supplies	18,061
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	0
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	0%
2024	Total
Total Water Use	14,079
Total Supplies	14,079
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	0
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	0%
2025	Total
Total Water Use	32,001
Total Supplies	32,001
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP – supply augmentation benefit	0
WSCP – use reduction savings benefit	0
Revised Surplus/Shortfall	0
Resulting % Use Reduction from WSCP Action	0%

Section 8: Water Shortage Contingency Plan

Current law requires urban water suppliers to prepare and adopt a Water Shortage Contingency Plan (WSCP) with the elements described in this subsection. The 2020 WSCP for the City is included in **Appendix F**.

As a wholesale urban water supplier, the Wholesale Water System "*shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies." (Water Code Section 10620(c)).*

Therefore, elements within the City's WSCP are noted when they apply directly to the Domestic Water System service area or the Wholesale Water System service area. The retail agencies within the City's Wholesale Water System service area are responsible for the implementation and enforcement of restrictions and prohibitions at the retail level within their respective service areas.

8.01 Water Supply Reliability Analysis

California Water Code

The analysis of water supply reliability conducted pursuant to Section 10635 (10632(a)(1)).

The water supply reliability analysis and drought risk assessment from **Section 7** are summarized in the City's WSCP provided in **Appendix F**.

8.02 Annual Water Supply and Demand Assessment Procedures

California Water Code

The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable;

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier;

(iii) Existing infrastructure capabilities and plausible constraints;

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment;

(v) A description and quantification of each source of water supply (10632 (a)(2))

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later (10632(1)).

Refer to the City's WSCP in **Appendix F** for the annual water supply and demand assessment procedures.

8.03 Six Standard Water Shortage Levels

California Water Code

(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events;

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels 10632(a)(3).

The six standard water shortage levels as defined in the City's WSCP are summarized in **Table 8-1**.

Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions** *(Narrative Description)*
1	Up to 10%	Variations in precipitation and mild droughts that may only last a year or two.
2	Up to 20%	Prolonged water shortages of moderate severity such as those caused by a multi-year drought.
3	Up to 30%	Most severe multi-year droughts, major failures in water production and distribution facilities.
4	Up to 40%	An exceptional crisis that could be caused only by the most severe multi-year drought, natural disaster, or catastrophic failure of major water supply infrastructure. Impacts to public health and safety would be significant.
5	Up to 50%	
6	>50%	
NOTES:		

8.04 Shortage Response Actions

California Water Code

Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation action.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action (10632(a)(4)).

The demand reduction actions for the Domestic Water System service area for each Shortage Level from the City's WSCP are summarized in **Table 8-2**. The Shortage Level in **Table 8-2** indicates the shortage level at which the demand reduction actions take effect. For each subsequent Shortage Level, all demand reduction actions from the previous Shortage Levels remain in effect. In Shortage Levels 1, the demand reduction actions are voluntary. Starting with Shortage Level 2, the demand reduction actions become mandatory. Cal Water manages billing for the Domestic Water System and cooperates with the City in providing rebates and water use surveys. See **Section 9** for more information on these Demand Management Measures.

Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
All Shortage Levels	Expand Public Information Campaign	Depends on Shortage Level. See Notes.	Implemented at all stages as appropriate to meet demand reduction targets	No
All Shortage Levels	Offer Water Use Surveys	Depends on Shortage Level. See Notes.	Implemented at all stages	No
All Shortage Levels	Provide Rebates on Plumbing Fixtures and Devices	Depends on Shortage Level. See Notes.	Implemented at all stages	No
All Shortage Levels	Provide Rebates for Landscape Irrigation Efficiency	Depends on Shortage Level. See Notes.	Implemented at all stages	No
All Shortage Levels	Landscape - Restrict or prohibit runoff from landscape irrigation	Depends on Shortage Level. See Notes.	Implemented at all stages	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	Landscape - Limit landscape irrigation to specific times	Depends on Shortage Level. See Notes.	Advise irrigation to be done after 6 pm and before 9 am for optimal efficiency	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	CII - Other CII restriction or prohibition	Depends on Shortage Level. See Notes.	Implement water efficiency measures to reduce potable water usage consistent with reduction targets	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	Landscape - Other landscape restriction or prohibition	Depends on Shortage Level. See Notes.	All irrigation and landscape projects shall adhere to the State's Model Water Efficient Landscape Ordinance	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Depends on Shortage Level. See Notes.	Implemented at all stages	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	Other - Require automatic shut off of hoses	Depends on Shortage Level. See Notes.	Require shut-off nozzles on hoses for vehicle washing with potable water	No for Level 1, Yes for Levels 2 and Higher
1	Decrease Line Flushing	Up to 10% (See Note 1)	Implemented as appropriate to meet demand reduction targets	No
1	Landscape - Limit landscape irrigation to specific times	Up to 10% (See Note 1)	Every other day, three days per week	No for Level 1, Yes for Levels 2 and Higher

Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
2	Other - Prohibit use of potable water for washing hard surfaces	Up to 20% (See Note 2)		Yes
2	CII - Other CII restriction or prohibition	Up to 20% (See Note 2)	Must reduce water usage consistent with reduction targets	Yes
3	Increase Water Waste Patrols	Up to 30% (See Note 3)		No
3	Reduce System Water Loss	Up to 30% (See Note 3)		No
3	Water Features - Restrict water use for decorative water features, such as fountains	Up to 30% (See Note 3)	Prohibit water use for decorative water features that do not recirculate water	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Up to 30% (See Note 3)		Yes
3	Other - Prohibit use of potable water for construction and dust control	Up to 30% (See Note 3)		No
3	Other	Up to 30% (See Note 3)	Implement mandatory customer reductions	Yes
3	Other	Up to 30% (See Note 3)	Implement drought ordinance	Yes
4	Increase Frequency of Meter Reading	Up to 40% (See Note 4)	Monitor water use for compliance reduction targets	No
4	Landscape - Prohibit all landscape irrigation	Up to 40% (See Note 4)	Prohibit all landscape irrigation with potable water	Yes
4	Other water feature or swimming pool restriction	Up to 40% (See Note 4)	Prohibit use of water for recreational purposes such as water parks and filling of pools	No
4	Other	Up to 40% (See Note 4)	Promote/expand use of recycled water	No

Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
5	Pools and Spas - Require covers for pools and spas	Up to 50% (See Note 5)		No
5	Moratorium or Net Zero Demand Increase on New Connections	Up to 50% (See Note 5)	Require net zero demand increase on new water service connections	No
6	Landscape - Prohibit all landscape irrigation	Greater than 50% (See Note 6)		Yes
6	Moratorium or Net Zero Demand Increase on New Connections	Greater than 50% (See Note 6)	Moratorium on new water service connections	No

NOTES:

1. Target demand reduction for all measures for Shortage Level 1 is up to 10%.
2. Target demand reduction for all measures for Shortage Level 2 is up to 20%.
3. Target demand reduction for all measures for Shortage Level 3 is up to 30%.
4. Target demand reduction for all measures for Shortage Level 4 is up to 40%.
5. Target demand reduction for all measures for Shortage Level 5 is up to 50%.
6. Target demand reduction for all measures through Shortage Level 6 is greater than 50% up to the anticipated shortage gap.

See Appendix F for the City's complete Water Shortage Contingency Plan.

The City Council may take any other action available to further reduce demands within the Domestic Water System service area to meet available supplies.

The Wholesale Water System will communicate with its retail water system customers regarding the anticipated shortage level and corresponding reductions in available water supplies. The Wholesale Water System will participate in public awareness campaigns and may implement measures to increase available supplies such as short-term water purchases or exchanges depending on the anticipated shortage gap (see **Table 8-3**).

Table 8-3: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions	Reduction in Shortage Gap (volume or percent)	Additional Explanation or Reference
3 or higher	Transfers, exchanges, purchases, etc.	Will depend on need and availability	
NOTES:			

8.04.1 Seismic Risk Assessment and Mitigation Plan

California Water Code

In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk (10632(a)(2)).

A seismic risk analysis and mitigation plan was completed as a part of the Kern County Multi-Jurisdiction Hazard Mitigation Plan. Earthquake hazard was determined to be a high priority issue county wide. A copy of the most recent draft Jurisdiction Annex for the City of Bakersfield from the Kern County Multi-Jurisdiction Hazard Mitigation Plan is provided in **Appendix I.** This seismic risk assessment is referenced in the City's WSCP in **Appendix F**.

In the event of an earthquake or other catastrophic event, the City will implement its Emergency Response Plan. The City will coordinate with the Kern County Emergency Operations Center in accordance with the Kern County Emergency Operations Plan.

8.05 Communication Protocols

California Water Code

Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications (10632(a)(5)).

Refer to the City's WSCP in **Appendix F** for a description of communication protocols.

8.06 Compliance and Enforcement (Domestic Water System Service Area)

California Water Code

For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2 (10632(a)(6)).

Refer to the City's WSCP in **Appendix F** for compliance and enforcement procedures.

8.07 Legal Authorities

California Water Code

(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

Water Code Section Division 1, Section 350 -Declaration of water shortage emergency condition. The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection (10632(a)(7)).

Refer to the City's WSCP in **Appendix F** for the legal authorities that empower its implementation.

8.08 Financial Consequences of WSCP

California Water Code

A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4);

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4);

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1 (10632(a)(8)).

Refer to the City's WSCP in **Appendix F** for a discussion of the financial consequences of water shortage conditions.

8.09 Monitoring and Reporting (Domestic Water System Service Area)

California Water Code

For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements (10632(a)(9)).

Refer to the City's WSCP in **Appendix F** for monitoring and reporting requirements and procedures.

8.10 WSCP Refinement Procedures (Domestic Water System Service Area)

California Water Code

Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed (10632(a)(10)).

Refer to the City's WSCP in **Appendix F** for evaluation and refinement procedures.

8.11 Special Water Feature Distinction (Domestic Water System Service Area)

California Water Code

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code (10632(b)).

Refer to the City's WSCP in **Appendix F** for measures that may apply to special water features.

8.12 Plan Adoption, Submittal and Availability

California Water Code

The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan (10632(a)(c)).

Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours (10645(b)).

If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared … no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department (10644(b)).

The adoption, submittal, and availability for the City's WSCP are included as a part of this 2020 UWMP update as described in **Section 10.02**.

Section 9: Demand Management Measures

9.01 Demand Management Measures

California Water Code

. . .The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20 (10631(f)(1)(A)).

The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

- *i. Water waste prevention ordinances*
- *ii. Metering*
- *iii. Conservation pricing*
- *iv. Public education and outreach*
- *v. Programs to assess and manage distribution system real loss*
- *vi. Water conservation program coordination and staffing support*
- *vii. Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

For an urban wholesale water supplier, as defined in Section 10608.12, (provide) a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs (10631(e)(2)).

9.01.1 Water Waste Prevention Ordinances (Domestic Water System)

The City has adopted water waste prevention measures as a part of its Municipal Code in Chapter 14.02, Chapter 12.28, and Chapter 14.04.300 and as a part of its WSCP. Copies of the City's Municipal Code chapters are provided in **Appendix E**. The City's WSCP is provided in **Appendix F**.

9.01.2 Metering

All customers within the Domestic Water System service area are charged based on metered readings and established rate schedules. All current and new connections including temporary connections are required to be metered and billed per volume of use. The Domestic Water System also meters and records water use for City owned facilities and landscaping.

The Wholesale Water System meters deliveries to all customers. Customers are billed monthly according to contractual rates.

Existing meters are checked on a regular basis for leakage and accuracy. Cal Water keeps an inventory of all meters in the Domestic Water System as well as a schedule of meter testing and repair by size, type, and customer class. Meters are repaired or replaced as needed to maintain accuracy within the recommended range appropriate for the meter type.

9.01.3 Conservation Pricing (Domestic Water System)

Customers within the Domestic Water System service area are billed a monthly service charge based on meter size and a quantity charge for water usage according to meter readings. A copy of the City's current rate schedule for the Domestic Water System is provided in **Appendix J**. The City's water rate structure meets the definition for conservation pricing since customers are charged a volumetric rate.

9.01.4 Public Education and Outreach

The City has implemented public education and outreach measures including the following:

- Providing water conservation information and links on the City's website.
- Providing funding for bill stuffers to educate and remind customers to conserve water.
- Providing water use summaries on customer bills and providing access to detailed water use information through Cal Water's website.
- Partnering with Cal Water to offer water conservation kits, rebates, and vouchers to encourage customers to implement conservation measures. Information and links are provided on the City's website.
- Distributing press releases regarding water resource issues and the need for water conservation.
- Participating in water conservation media campaigns with other local purveyors.
- Participating in "Water Awareness Month" each year in conjunction with the Water Association of Kern County and the American Water Works Association.
- Participating with KCWA ID4 in school education programs including classroom education, water facility tours, and media campaigns. Funding from these programs come from general tax revenues collected from throughout the metropolitan Bakersfield area.

9.01.5 Programs to Assess and Manage Distribution System Real Loss (Domestic Water System)

The City's Domestic Water System conducts the required annual water audits for the Domestic Water System using the AWWA Water Audit software. Water production and consumption are monitored to identify possible areas of leakage. Customer billing records are monitored for unusually high water use. A leak detection and repair program is implemented through Cal Water, which provides maintenance of the Domestic Water System under contract and makes repairs as needed.

The City partners with Cal Water to provide water efficiency inspections and landscape water surveys as requested by customers to identify problems and recommend repairs or improvements. Large City owned landscaped areas include master control systems that monitor the irrigation system and alert staff to potential water line leaks or sprinkler head breaks.

The City's Domestic Water System losses over the last five years have averaged approximately 4 percent per year as shown on the AWWA Water Loss Audit reports in **Appendix H**.

9.01.6 Water Conservation Program Coordination and Staffing Support

The City partners with Cal Water for the implementation of its Water Conservation Program. Cal Water maintains a Water Conservation Program Coordinator that oversees the water conservation programs available to the City's Domestic Water System service area customers. The Wholesale Water System does not have a water conservation program coordinator.

9.01.7 Other Demand Management Measures

The City has implemented other demand management measures including the following:

- Using recycled water for irrigation of the Kaiser Permanente Sports Village.
- Installing “smart” irrigation controllers in all City parks.
- Closing City spray parks during drought conditions.
- Reducing the time and frequency of irrigation for City parks and landscape areas during drought conditions.
- Installing artificial turf at various City facilities and within street medians throughout the City.
- Prohibiting natural lawn within newly constructed City medians.
- Reducing the frequency that City vehicles are washed.
- Replaced bathroom fixtures with water efficient fixtures at the Mechanics Bank Arena, Theater, and Convention Center, and the San Joaquin Community Ice Center of Bakersfield.
- Reducing the frequency and duration of fire apparatus testing operations.
- Update of landscape standards to reflect the current State Model Water Efficient Landscape Ordinance.
- Adopting, by reference, the California Green Code sections relating to installation of low water use plumbing fixtures in new construction.

9.01.8 Asset Management (Wholesale Water System)

The Wholesale Water system actively manages its infrastructure. Water system facilities are inspected regularly, and repairs are made as required. Maintenance operations are scheduled as appropriate for each facility.

9.01.9 Wholesale Supplier Assistance Programs

The Wholesale Water System does not have assistance programs beyond those described in other sections of this UWMP.

9.01.10 Implementation over the Past Five Years

California Water Code

(Provide) a narrative description of that addresses the nature and extent of each water demand management measure implemented over the past five years (10631(f)(1)(A)).

A narrative description of the nature of demand management measures implemented over the past five years is provided in previous sections. Cal Water provided information regarding the extent of the implementation of demand management efforts over the past five years within the Domestic Water System service area which is summarized as follows:

- High-Efficiency Washer Rebates – 430
- Non-Premium High-Efficiency Toilet Rebates – 185
- Premium High-Efficiency Toilet Rebates – 55
- Smart Irrigation Controller Rebates – 482

- Conservation Kits – 370
- Rotating Nozzles – 843.

9.01.11 Implementation to Achieve Water Use Targets (Domestic Water System)

California Water Code

The narrative shall describe the water demand management measure that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20 (10631(f)(1)(A)).

While the Domestic Water System has achieved its water use reduction targets, it will continue with the implementation of its existing DMMs and look for ways to improve water use efficiency.

Section 10: Plan Adoption, Submittal, and Implementation

10.01 Public Notice

California Water Code

> *Every urban water supplier required to prepare a plan shall…at least 60 days prior to the public hearing on the plan…notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan (10621(b)).*
>
> *…The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area (10642).*
>
> *…Prior to adopting either [the plan or water shortage contingency plan], the urban water supplier shall make both of the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies.*
>
> *Government Code section 6066 - Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day (10642).*

The efforts the City has taken to involve appropriate agencies and the general public in the planning process are summarized below. Copies of notices are included in **Appendix A**.

For the 2020 Plan update and Water Shortage Contingency Plan, the public hearing was held on November 10, 2021. Accordingly, notice was provided as follows:

- Notice to County on April 7, 2021 (at least 60 days prior to hearing),
- Letter to Interested Parties (see **Section 2.02**) on April 7, 2021,
- Notice to County and Interested Parties on October 27, 2021 with date and time of hearing,
- Notice in local newspaper on October 27, 2021 and November 3, 2021 (per Gov. Code 6066 – 2 weeks in advance of hearing),
- Posted Draft 2020 UWMP and Water Shortage Contingency Plan on City of Bakersfield Water Resources Department's website and Department's office on October 27, 2021 (2 weeks prior to hearing), and
- Drafts of the documents were provided to the entities that requested such drafts.

10.02 Plan Adoption, Submittal, and Implementation

California Water Code

After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing (10642).

Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021… (10621(e)).

The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan (10635(c)).

The plan, or amendments to the plan, submitted to the department … shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department (10644(a)(2)).

An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption (10644(a)(1).

Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours. (10645(a)).

An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings (10621(c)).

The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640) (10621(d)).

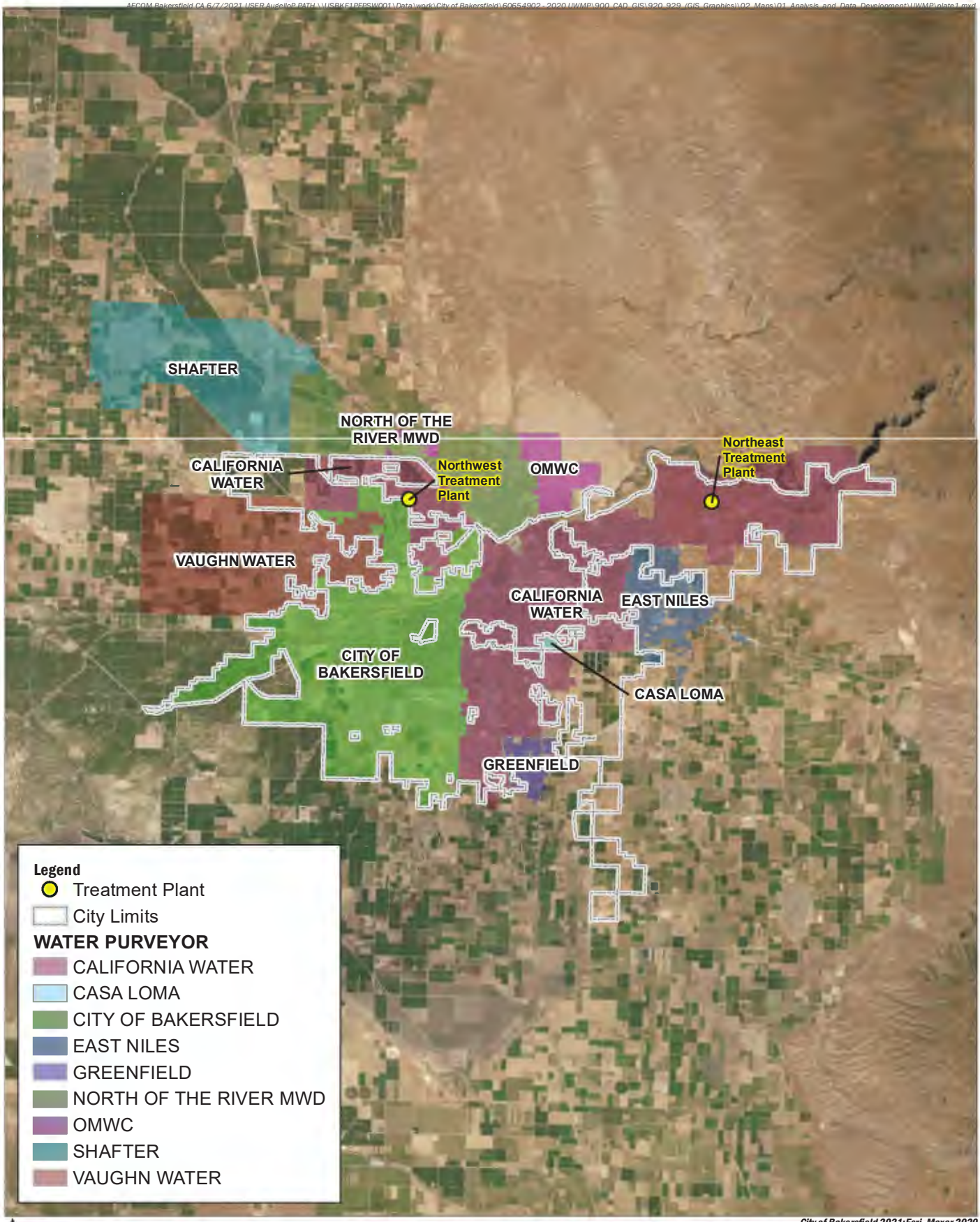
Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption (10644(a)(1)).

The 2020 RUWMP update and Water Shortage Contingency Plan were adopted by the City at the Regular Meeting of the City Council on December 15, 2021. A public hearing was held on November 10, 2021. The intent of the Public Hearing was to gather input from the public that is served by the City as well as other interested entities. Written and verbal comments received during the public hearing process have been addressed as appropriate in the final Plan documents. A copy of the resolution adopting the 2020 UWMP update and Water Shortage Contingency Plan is included in **Appendix B**.

The 2020 UWMP update and Water Shortage Contingency Plan will be submitted to the California Department of Water Resources, the California State Library, and the County within 30 days of adoption.

Commencing no later than 30 days after adoption, the City will have a copy of the 2020 UWMP and Water Shortage Contingency Plan available for public review at City Hall during normal business hours. The 2020 UWMP and Water Shortage Contingency Plan will also be posted on the City's website.

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City of Bakersfield 2021;Esri, Maxar 2020

AECOM
City of Bakersfield

PLATE 1
WATER PURVEYORS IN THE VICINITY OF THE CITY OF BAKERSFIELD

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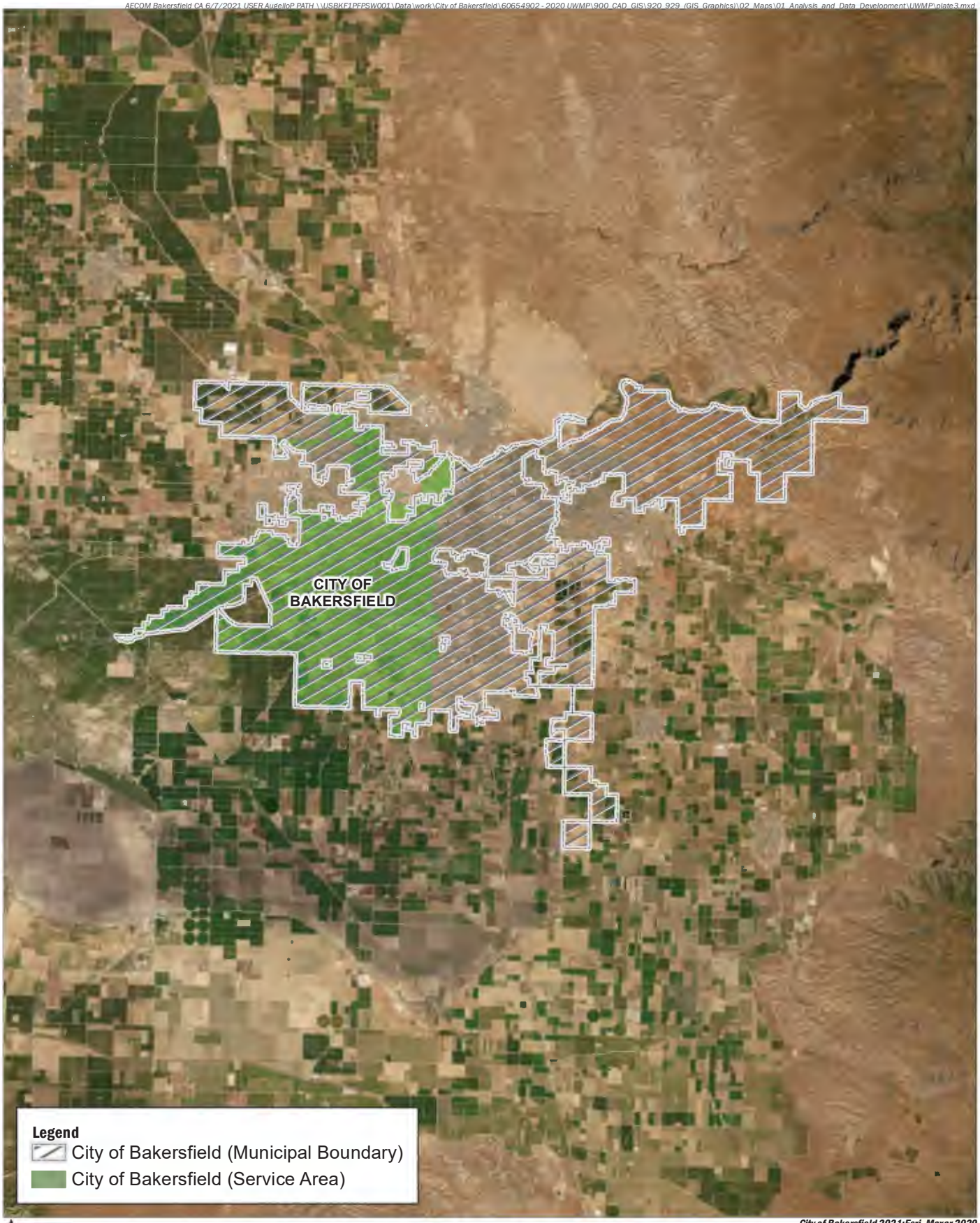


City of Bakersfield 2021;Esri, Maxar 2020

AECOM
City of Bakersfield

PLATE 2
CITY OF BAKERSFIELD DOMESTIC WATER SYSTEM'S SERVICE AREA

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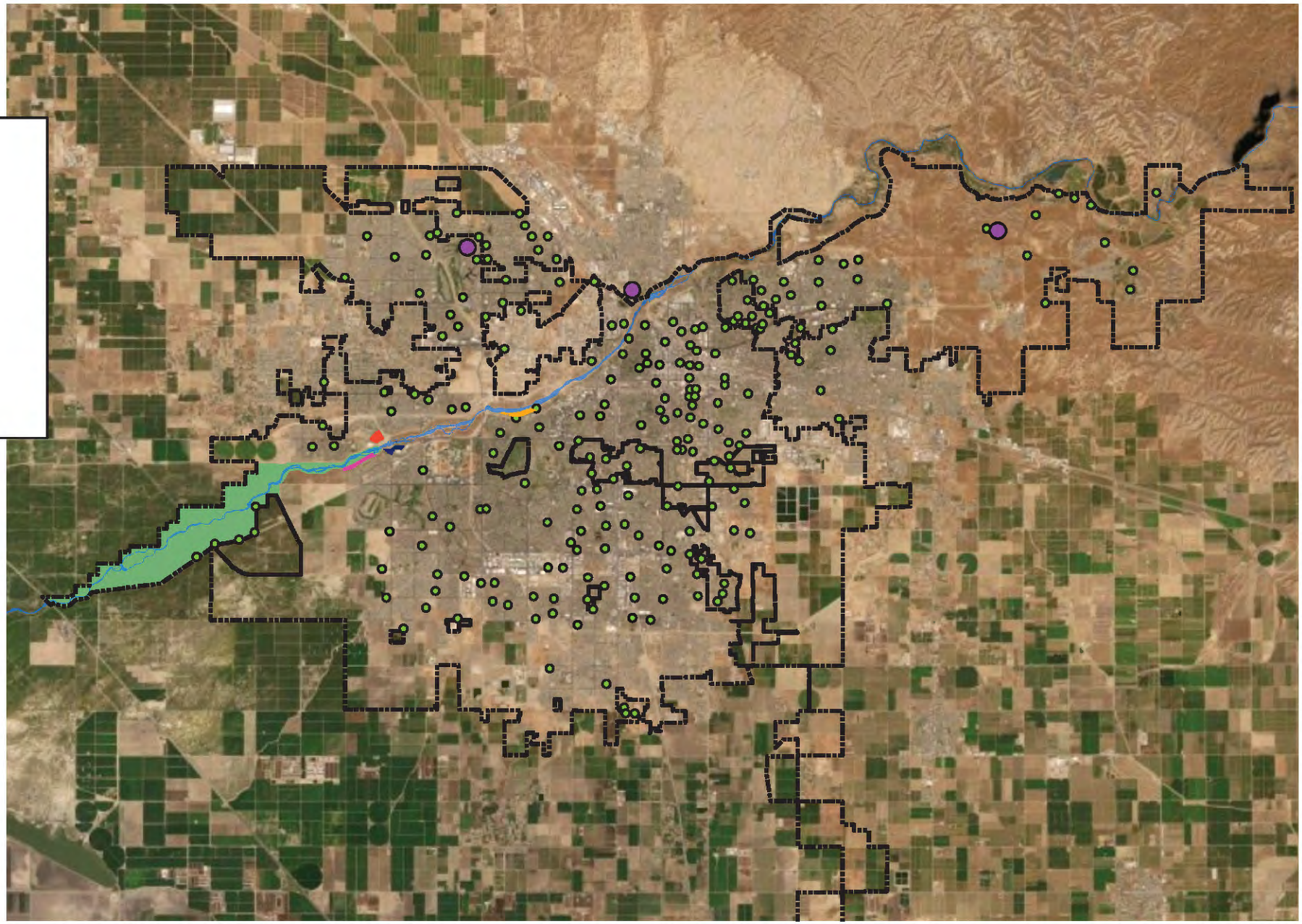


City of Bakersfield 2021;Esri, Maxar 2020

AECOM
City of Bakersfield

PLATE 3
CITY OF BAKERSFIELD WATER SYSTEM BOUNDARY AND MUNICIPAL BOUNDARY

City of Bakersfield Water Facilities



LEGEND

- Kern River
- Treatment Plant
- Domestic Well
- City Limits

City Recharge Areas

- 2800 Acre Water Bank
- Aera Park
- The Park at River Walk
- Wilson Ditch
- Truxtun Lakes

N

0 1.5 3 6 9 12 Miles

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

PLATE 4

Date: 7/31/2020

Disclaimer: Treatment Plant locations identified on this map are approximate based on best available information and should be used for reference only.

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Appendix A:

Notices:

- Notice of UWMP Preparation
- Notice of Public Hearing
- Proof of Publication

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BAKERSFIELD

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April 7, 2021

EAST NILES COMMUNITY SERVICES DISTRICT
P.O.BOX 6038
Bakersfield, CA 93386

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

In accordance with the California Water Code Sections 10620 and 10621, you are being notified that the City of Bakersfield is reviewing its Urban Water Management Plan (UWMP) and considering amendments or changes to the Plan. The City's 2020 UWMP Update is being prepared in accordance with the Urban Water Management Planning Act and current California Water Code requirements.

This letter provides the required 60-day notice of the Public Hearing and Adoption Meeting for the City's 2020 UWMP Update which is planned to be held in June or July 2021. Information regarding the time and location of the public hearing will be sent at a later date. An electronic file with the draft UWMP is anticipated to be provided during June 2021. After adoption by the City, the UWMP will be submitted to the California Department of Water Resources.

The City welcomes your input regarding the preparation of the 2020 UWMP. If you have any comments regarding the City's 2020 UWMP Update, please provide them to the City Water Resources Department at your earliest convenience.

Very truly yours,
Art Chianello, Water Resources Manager

By: S. Blue

Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

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April 7, 2021

GREENFIELD COUNTY WATER DISTRICT
551 Taft Highway
Bakersfield, CA 93307

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

In accordance with the California Water Code Sections 10620 and 10621, you are being notified that the City of Bakersfield is reviewing its Urban Water Management Plan (UWMP) and considering amendments or changes to the Plan. The City's 2020 UWMP Update is being prepared in accordance with the Urban Water Management Planning Act and current California Water Code requirements.

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Very truly yours,
Art Chianello, Water Resources Manager

By: S. Blue

Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

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April 7, 2021

KERN COUNTY PLANNING AND NATURAL RESOURCES
Attn: Lorelei Oviatt, Director
2700 M Street, Suite 100
Bakersfield, CA 93301

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

In accordance with the California Water Code Sections 10620 and 10621, you are being notified that the City of Bakersfield is reviewing its Urban Water Management Plan (UWMP) and considering amendments or changes to the Plan. The City's 2020 UWMP Update is being prepared in accordance with the Urban Water Management Planning Act and current California Water Code requirements.

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Art Chianello, Water Resources Manager

By: S. Blue
Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

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April 7, 2021

KERN COUNTY WATER AGENCY ID4
P.O.BOX 58
Bakersfield, CA 93302

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

In accordance with the California Water Code Sections 10620 and 10621, you are being notified that the City of Bakersfield is reviewing its Urban Water Management Plan (UWMP) and considering amendments or changes to the Plan. The City's 2020 UWMP Update is being prepared in accordance with the Urban Water Management Planning Act and current California Water Code requirements.

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Very truly yours,
Art Chianello, Water Resources Manager

By: S. Blue

Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

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April 7, 2021

NORTH OF THE RIVER MUNICIPAL WATER DISTRICT
4000 Rio Del Norte Street
Bakersfield, CA 93308

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

In accordance with the California Water Code Sections 10620 and 10621, you are being notified that the City of Bakersfield is reviewing its Urban Water Management Plan (UWMP) and considering amendments or changes to the Plan. The City's 2020 UWMP Update is being prepared in accordance with the Urban Water Management Planning Act and current California Water Code requirements.

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Very truly yours,
Art Chianello, Water Resources Manager

By: S. Blue

Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

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April 7, 2021

OILDALE MUTUAL WATER COMPANY
P.O. BOX 5638
Bakersfield, CA 93308-5638

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

In accordance with the California Water Code Sections 10620 and 10621, you are being notified that the City of Bakersfield is reviewing its Urban Water Management Plan (UWMP) and considering amendments or changes to the Plan. The City's 2020 UWMP Update is being prepared in accordance with the Urban Water Management Planning Act and current California Water Code requirements.

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By: S. Blue

Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

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April 7, 2021

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
849 ALLEN ROAD
Bakersfield, CA 93314

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

In accordance with the California Water Code Sections 10620 and 10621, you are being notified that the City of Bakersfield is reviewing its Urban Water Management Plan (UWMP) and considering amendments or changes to the Plan. The City's 2020 UWMP Update is being prepared in accordance with the Urban Water Management Planning Act and current California Water Code requirements.

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By: S. Blue

Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

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April 7, 2021

VAUGHN WATER COMPANY
10014 GLENN STREET
Bakersfield, CA 93312

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

THE SOUND OF Something Better

April 7, 2021

CALIFORNIA WATER SERVICE
3725 H Street
Bakersfield, CA 93304

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

In accordance with the California Water Code Sections 10620 and 10621, you are being notified that the City of Bakersfield is reviewing its Urban Water Management Plan (UWMP) and considering amendments or changes to the Plan. The City's 2020 UWMP Update is being prepared in accordance with the Urban Water Management Planning Act and current California Water Code requirements.

This letter provides the required 60-day notice of the Public Hearing and Adoption Meeting for the City's 2020 UWMP Update which is planned to be held in June or July 2021. Information regarding the time and location of the public hearing will be sent at a later date. An electronic file with the draft UWMP is anticipated to be provided during June 2021. After adoption by the City, the UWMP will be submitted to the California Department of Water Resources.

The City welcomes your input regarding the preparation of the 2020 UWMP. If you have any comments regarding the City's 2020 UWMP Update, please provide them to the City Water Resources Department at your earliest convenience.

Very truly yours,
Art Chianello, Water Resources Manager

By: S. Blue

Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

THE SOUND OF Something Better

April 7, 2021

CASA LOMA WATER COMPANY
1016 Lomita Drive
Bakersfield, CA 93307

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

In accordance with the California Water Code Sections 10620 and 10621, you are being notified that the City of Bakersfield is reviewing its Urban Water Management Plan (UWMP) and considering amendments or changes to the Plan. The City's 2020 UWMP Update is being prepared in accordance with the Urban Water Management Planning Act and current California Water Code requirements.

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Samuel Blue, P.E.
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1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

BAKERSFIELD

THE SOUND OF *Something Better*

April 7, 2021

CITY OF BAKERSFIELD
Attn: City Clerk
1600 Truxtun Avenue
Bakersfield, CA 93301

SUBJECT: **60-Day Notice - Preparation of 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Samuel Blue, P.E.
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661-326-3715 FAX: 661-852-2127

BAKERSFIELD

THE SOUND OF Something Better

April 7, 2021

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By: S. Blue
Samuel Blue, P.E.
Civil Engineer III, Water Resources

Water Resources Department
1000 Buena Vista Road, Bakersfield, CA 93311
661-326-3715 FAX: 661-852-2127

NOTICE OF PUBLIC HEARING

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The PUBLIC HEARING will be held during the City of Bakersfield Water Board meeting at 12:00 PM on Wednesday, November 10, 2021 at the Water Resources Department, 1000 Buena Vista Road, Bakersfield, CA 93311.

The City invites all interested parties to attend and present their comments. The draft 2020 UWMP and WSCP are available for review at the City's office and on its website. Please submit written comments by 5:00 PM on Monday November 8th to the City Water Resources Department at 1000 Buena Vista Road, Bakersfield, CA 93311.

BAKERSFIELD
THE SOUND OF Something Better

October 27, 2021

CITY OF BAKERSFIELD
Attn: City Clerk
1600 Truxtun Avenue
Bakersfield, CA 93301

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD
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October 27, 2021

COUNTY OF KERN
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Bakersfield, CA 93301

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD
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October 27, 2021

CALIFORNIA WATER SERVICE
3725 H Street
Bakersfield, CA 93304

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD

THE SOUND OF Something Better

October 27, 2021

CASA LOMA WATER COMPANY
1016 Lomita Drive
Bakersfield, CA 93307

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD
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October 27, 2021

EAST NILES COMMUNITY SERVICES DISTRICT
P.O.BOX 6038
Bakersfield, CA 93386

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Time: 12:00 PM
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1000 Buena Vista Road
Bakersfield, CA 93311

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD

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October 27, 2021

GREENFIELD COUNTY WATER DISTRICT
551 Taft Highway
Bakersfield, CA 93307

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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1000 Buena Vista Road
Bakersfield, CA 93311

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD
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October 27, 2021

KERN COUNTY PLANNING AND NATURAL RESOURCES
Attn: Lorelei Oviatt, Director
2700 M Street, Suite 100
Bakersfield, CA 93301

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD
THE SOUND OF Something Better

October 27, 2021

KERN COUNTY WATER AGENCY ID4
P.O.BOX 58
Bakersfield, CA 93302

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Bakersfield, CA 93311

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD

THE SOUND OF Something Better

October 27, 2021

NORTH OF THE RIVER MUNICIPAL WATER DISTRICT
4000 Rio Del Norte Street
Bakersfield, CA 93308

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Bakersfield, CA 93311

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD
THE SOUND OF Something Better

October 27, 2021

OILDALE MUTUAL WATER COMPANY
P.O. BOX 5638
Bakersfield, CA 93308-5638

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD

THE SOUND OF Something Better

October 27, 2021

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
849 ALLEN ROAD
Bakersfield, CA 93314

SUBJECT: **Notice of Public Hearing on 2020 Update to the City of Bakersfield Urban Water Management Plan**

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Art Chianello

Art Chianello, P.E.
Water Resources Manager

BAKERSFIELD

THE SOUND OF Something Better

October 27, 2021

VAUGHN WATER COMPANY
10014 GLENN STREET
Bakersfield, CA 93312

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Sincerely,

Art Chianello

Art Chianello, P.E.
Water Resources Manager

THE BAKERSFIELD CALIFORNIAN
3700 PEGASUS DR
BAKERSFIELD CA 93308-6803
(661)395-7207

ORDER CONFIRMATION

Salesperson: LEGALS | Printed at 10/25/21 14:25 by asanc-bk

Acct #: 88751 | Ad #: 52130 | Status: New WHOLD

CITY OF BAKERSFIELD/LEGALS ONL
1600 TRUXTUN 2ND FLOOR AVE
BAKERSFIELD CA 93301

Start: 10/27/2021 Stop: 11/03/2021
Times Ord: 2 Times Run: ***
1LGL 2.00 X 24.00 Words: 209
Total 1LGL 48.00
Class: B0520 LEGAL NOTICES
Rate: LL Cost: 435.26
Affidavits: 1

Contact:
Phone: (661)326-3742
Fax#: (661)852-2100
Email: accountspayable@bakersfieldc
Agency:

Ad Descrpt: NOTICE OF PUBLIC HEARING
Given by: *
P.O. #:
Created: asanc 10/25/21 14:23
Last Changed: asanc 10/25/21 14:25

PUB	ZONE	EDT	TP	RUN DATES
CALC	A	95	S	10/27 11/03
CWEB	A	93	S	10/27 11/03

AUTHORIZATION

Under this agreement rates are subject to change with 30 days notice. In the event of a cancellation before schedule completion, I understand that the rate charged will be based upon the rate for the number of insertions used.

_____ _____
Name (print or type) Name (signature)

.

NOTICE OF PUBLIC HEARING

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October 27, November 3, 2021
52130

Appendix B:

Resolution Adopting 2020 UWMP Update

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RESOLUTION NO. 216-2021

A RESOLUTION OF THE COUNCIL OF THE CITY OF BAKERSFIELD ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN AND THE 2020 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the California Legislature enacted Assembly Bill 797 (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act) during the 1983-1984 Regular Session, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre foot of water annually, prepare an Urban Water Management Plan (UWMP), the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, the City of Bakersfield is an urban supplier of water providing water to a population of over 160,000; and

WHEREAS, the UWMP shall be periodically reviewed at least once every five years in years ending in five or zero, and that the City shall make any amendments or changes to its plan which are indicated by the review; and

WHEREAS, the Water Shortage Contingency Plan (WSCP) provides an action plan during periods of drought and/or water supply issues; and

WHEREAS, the WSCP is considered a standalone document and is included as an appendix to the UWMP; and

WHEREAS, the UWMP and the WSCP must be adopted after public review and hearing, and filed with the California Department of Water Resources; and

WHEREAS, the City has, therefore, prepared and circulated for public review a final draft UWMP and WSCP, and a properly noticed public hearing regarding said plans was held by the City of Bakersfield Water Resources Department on November 10, 2021; and

WHEREAS, on November 10, 2021, the City Water Board unanimously recommended that the City Council approve a resolution to adopt the 2020 UWMP and 2020 WSCP; and

NOW, THEREFORE, BE IT RESOLVED, by the Council of the City of Bakersfield as follows:

CITY OF BAKERSFIELD ORIGINAL

1. The 2020 Urban Water Management Plan and the 2020 Water Shortage Contingency Plan are hereby adopted and ordered filed with the Clerk of the City Council;

2. The Water Resources Manager is hereby authorized and directed to implement the Water Conservation Programs as set forth in the 2020 Urban Water Management Plan and 2020 Water Shortage Contingency Plan, which includes water shortage contingency analysis and recommendations to the City of Bakersfield Water Board regarding necessary procedures, rules, and regulations to carry out effective and equitable water conservation and water recycling programs.

3. In a water shortage, the Water Board is hereby authorized to declare a Water Shortage Emergency according to the Water Shortage Stages and Triggers indicated in the WSCP and implement necessary elements of the WSCP.

--------o0o--------

CITY OF BAKERSFIELD
ORIGINAL

I HEREBY CERTIFY that the foregoing Resolution was passed and adopted by the Council of the City of Bakersfield at a regular meeting thereof held on DEC 15 2021, by the following vote:

(AYES:)	COUNCIL MEMBER	✓ ARIAS, ✓ GONZALES, ✓ WEIR, ✓ SMITH, ✓ FREEMAN, ✓ GRAY, ✓ PARLIER
NOES:	COUNCIL MEMBER	_____
ABSTAIN:	COUNCIL MEMBER	_____
ABSENT:	COUNCIL MEMBER	_____

Julie Drimakis

JULIE DRIMAKIS, MMC
CITY CLERK and Ex Officio Clerk of
the Council of the City of Bakersfield

APPROVED DEC 15 2021

By _____
KAREN GOH
Mayor

APPROVED AS TO FORM:
VIRGINIA GENNARO
City Attorney

By _____
VIRGINIA GENNARO
City Attorney

CITY OF BAKERSFIELD ORIGINAL

BAKERSFIELD

THE SOUND OF *Something Better*

MINUTES OF THE REGULAR MEETING OF THE WATER BOARD - CITY OF BAKERSFIELD

Wednesday, November 10, 2021 - 12:00 p.m.
Water Resources Conference Room
1000 Buena Vista Rd., Bakersfield, CA 93311

I. **CALL TO ORDER**

Chairman Smith called the meeting to order at 12:02 p.m.

2. **ROLL CALL**

Present: Chairman Smith, Member Freeman, Member Parlier
Absent: None

3. **PUBLIC STATEMENTS** - None

4. **MINUTES**

A. Approval of the Minutes of the Special Meeting of June 21, 2021.

Motion by Member Freeman to approve the Minutes of June 21, 2021. UNANIMOUSLY APPROVED.

5. **KERN RIVER LEVEE DISTRICT - None**

6. **REPORTS**

A. City's response to Governor's Drought Proclamation and Executive Order

Daniel Maldonado, Water Resources Planner, presented an overview of the Governor's Proclamation and the City of Bakersfield's Domestic Water Conservation plan. The Governor's Proclamation on October 19, 2021, states: "To preserve the State's surface and groundwater supplies and better prepare for the potential for continued dry conditions next year, local water suppliers are directed to execute their urban Water Shortage Contingency Plans at a level appropriate to local conditions that takes into

account the possibility of a third consecutive dry year". Current shortage level for City of Bakersfield is Level 2 – multi year drought. The Governor's Executive Order on July 8, 2021, asks all Californians to reduce water usage by 15% from 2020 water usage. Mr. Maldonado provided current water usage and conservation data. The City of Bakersfield (COB) Domestic Water System observed an 8% reduction per capita in July 2021 and a 3% reduction per capita in August 2021. September and October 2021 observed an increase per capita water usage. Mandatory requirements for COB Domestic Water System Service Area include prohibit the use of potable water for washing down hard-surfaced areas such as sidewalks, driveways, buildings, patios, parking lots, etc. Require shut-off nozzles on hoses for vehicle washing with potable water. Limit outdoor landscape and turf water usage to three days per week, during the watering times reflected in the Municipal Code. Odd number addresses water on Tuesday, Thursday, and Saturday, even number addresses water on Wednesday, Friday, and Sunday with no watering on Monday. Prohibit outdoor water usage during and 48 hours after a rain event resulting in measurable precipitation. The COB provided a public information campaign and newsletter/bill insert to notify customers of water shortage level, encourage water conservation and information regarding implementation of water use restrictions. In addition, Mr. Maldonado reminded all that Water Conservation Rebates and Kits are available to the public via Cal Water's Website as well as City of Bakersfield's Website and the City of Bakersfield's Mobile App. *Bakersfield Mobile* is available to report a Service Request allowing residents to submit Service Request regarding Water Waste.

Motion by Member Freeman to Receive and File Report
UNANIMOUSLY APPROVED

7. **HEARINGS**

A. Public Hearing to consider adoption of City's 2020 Urban Water Management Plan (UWMP)

Samuel Blue, Engineer III, presented an overview of the City's 2020 Urban Water Management Plan (UWMP). The UWMP was prepared in accordance with the California Urban Water Management Planning Act and the 2020 UWMP Guidebook provided by Department of Water Resources. Each urban water supplier providing over 3,000 acre-feet of water or serving 3,000 customers or more is required to prepare an UWMP. The City's 2020 UWMP combines both retail, which is the City's domestic water system, and wholesale, which is the City's Kern River supplies designated for urban use. A new requirement for the 2020 UWMP is that a Water Shortage Contingency Plan (WSCP) must be prepared as a separate document that can be modified and adopted more frequently than the UWMP. This hearing addresses both the UWMP and the WSCP. Mr. Blue explained the UWMP consists of 10 chapters with Chapter 8 providing a summary of the Water Shortage Contingency Plan, which is included as an appendix to the UWMP which can be updated and adopted more frequently than the UWMP. The City has coordinated with other local water purveyors in preparing this Plan and has also made the final draft

publicly available for review and comment. Staff recommends the Water Board approve and recommend both the UWMP and the WSCP for formal adoption at the December 15, 2021 City Council meeting via resolution.
Upon conclusion of Mr. Blue's report, Kimberly Aleman, Water Board Secretary opened the public hearing. After receiving no person requesting to speak in favor or in opposition of the item. Ms. Aleman closed the public hearing and returned the item to the Water Board for comment and action.

Motion by Member Freeman to recommend adoption of the City's 2020 Urban Water Management Plan (UWMP) to City Council via resolution. UNANIMOUSLY APPROVED

8. **NEW BUSINESS**

A. Proposed 2022 Water Board Meeting Calendar

Motion by Member Freeman to approve 2022 Water Board Meeting Calendar
UNANIMOUSLY APPROVED

9. **WATER BOARD STATEMENTS** - None

10. **CLOSED SESSION** - None

11. **CLOSED SESSION ACTION** - None

12. **ADJOURNMENT**

Chairman Smith adjourned the meeting at 12:27 p.m.

Bob Smith, Chairman
City of Bakersfield Water Board

Kimberly Aleman, Secretary
City of Bakersfield Water Board

Appendix C:

Climate Change Information from Kern River GSA GSP

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KRGSA agencies have various rights associated with storing water in Lake Isabella. The City can use up to 34% of the total conservation storage space in the reservoir. KDWD is also allowed to store water within and as a part of the City's 34% conservation space with storage rights varying from month to month based on a rule curve (KDWD, 2015). KDWD can store a maximum of 44,000 AFY in Lake Isabella with a maximum carryover amount of 7,000 AFY (KDWD, 2015). The Kern County Water Agency also has the right to store water in Lake Isabella during years when Kern River flows are approximately 125% of the long-term average or greater. As mentioned previously, KCWA has Kern River rights for the Lower River and allocates a portion of this to ID4.

The ability to store water in Lake Isabella for subsequent use and the ability to carry-over storage to the following year are important water management tools for securing long-term sustainability in the KRGSA Plan Area. Primary sustainability benefits of conserving water in Lake Isabella are summarized below:

- Regulates the timing of surface water deliveries to better match demands by storing winter and spring runoff for use in the summer. This practice provides water managers with more flexibility to satisfy demands while also optimizing groundwater recharge.
- Allows Carry-Over of stored water from one year to the next, which can be especially valuable when the following year is dry. Reliance on the stored water in dry years allows groundwater pumping to be reduced when water levels are likely declining, while still meeting water demands.
- Optimizes capture and management of runoff for beneficial use when climate change results in less snowpack and earlier snow melt runoff.

4.7 PROJECTED WATER BUDGETS

Although the historical water budgets provide useful water budget deficits representing average hydrologic conditions, changes in projected water supplies are anticipated to impact future water budgets. To better understand potential future deficits, the C2VSimFG-Kern local model was modified to simulate baseline and GSP conditions over a 50-year Planning and Implementation horizon incorporating 50 years of hydrologic data in the Subbasin. Model set-up and baseline development is described in **Attachment 1** and summarized below with an emphasis on conditions in the KRGSA.

4.7.1 Baseline Development

The 50-year planning and implementation horizon begins in WY 2021 after GSP submittal and review and extends through WY 2070. This 50-year sequence was developed using actual hydrologic data and water management practices documented in the 20-year historical Study Period WY 1995 – WY 2014, which represents average hydrologic conditions. These years were re-combined/repeated into a 50-year sequence, which also represented average hydrologic conditions in terms of average precipitation and the long-term mean flow on the Kern River. In addition, the intervening years between the last year of water budget data (Current Condition Study Period of WY 2015) and the beginning of GSP implementation (2021) had to be "bridged" to represent WY 2016 through 2020.

The sequence of the 20 years from the historical Study Period was re-ordered slightly to prevent the sequence from ending in the drought of record and to equal 50 years of average hydrologic data. The model set-up of the 50-year sequence based on historical data is summarized in **Table 4-13**.

Table 4-13: C2VSimFG-Kern Model Set-Up for the Planning and Implementation Horizon

Planning and Implementation Horizon (Water Year)	Based on Historical Study Period (Water Year)
2021 - 2032	2003 - 2014
2033 - 2052	1995 - 2014
2053 - 2070	1995 - 2012

Using this sequencing, three separate 50-year baselines were developed as described below.

1. **Baseline Conditions**: represented by current land use and projected water supply and demand. For current land use, conditions from WY 2013 were selected. Land use for the more recent years of WY 2014 and 2015 contained abnormal conditions associated with the drought of record including agricultural land fallowing and mandatory conservation measures. As such, these recent years would likely under-estimate projected future demands. Increases in urban demand for the KRGSA were simulated using projections of population and per capita water use from local KRGSA UWMPs including the City of Bakersfield, Cal Water, NORMWD/OMWC, Vaughn WC, Lamont PUD, and ENCSD. Using data from the UWMPs and County population projections, an area-weighted average population growth rate of 1.17 percent annually through 2040 and a 0.8 percent increase for subsequent years was incorporated into the model. Using targets of per capita water use from the UWMPs, a weighted average of 248 gallons per capita per day (gpcd) was developed and applied over the entire Planning and Implementation horizon. Reductions in SWP availability provided by KCWA/DWR for ID4 and KDWD were incorporated into the analysis.

2. **2030 Climate Change Conditions**: represented by reductions in water supply and increases in water demand using DWR climate change factors and guidance. For the KRGSA, further reductions in SWP water availability provided by KCWA/DWR (2070 climate change tables) for ID4 and KDWD were incorporated. Increases in urban demand were estimated using the same methodology as applied in baseline conditions (see description above). Agricultural demand was increased by an average of about four percent based on decreases in effective precipitation and higher estimates of potential ET as provided by DWR. DWR climate change guidance also includes a change in the timing of Kern River flows, with more winter/early spring flows and less summer flows. However, the total volume of the Kern River does not change.

3. **2070 Climate Change Conditions:** represented by further reductions to the 2030 Climate Change conditions for water supply and additional increases in water demand using DWR climate change factors and guidance. For the KRGSA, reductions in SWP amounts for ID4 and

KDWD were incorporated from KCWA/DWR 2070 SWP availability data as summarized and distributed by KGA (Erlwine, 2019). Increases in urban demand were estimated using the same methodology as applied in baseline conditions. Increases in agricultural demand of approximately seven percent were based on DWR guidance for 2070 conditions of precipitation and potential ET.

4.7.2 Projected Water Budget Deficits

Based on the increases in demand and decreases in water supplies, additional water budget deficits are projected for future conditions. The primary changes to the checkbook water budget are summarized in **Table 4-14** for planning purposes. A more detailed assessment of projected water budgets has been developed for both the Subbasin and the KRGSA using the C2VSimFG-Kern local model. These Subbasin-wide analyses are described in **Attachment 1** and summarized for the KRGSA in **Section 4.7.3**.

Table 4-14: Projected Water Budget Components and Potential Deficits (Checkbook Method)

Water Budget Component	Historical Average Annual Amounts (AFY)	Baseline Conditions (AFY)	2030 Climate Change Conditions (AFY)	2070 Climate Change Conditions (AFY)
SWP[1] – ID4	74,035	52,758	51,182	48,759
SWP - KDWD	18,655	15,765	15,294	14,537
TOTAL SWP	92,690	68,523	66,476	63,296
Net decrease in SWP from historical:		**24,167**	**26,214**	**29,394**
Agriculture Demand	261,019	261,019	271,460	281,460
Urban Demand[2]	167,970	182,290	178,115	254,117
TOTAL DEMAND	428,989	443,309	449,575	535,577
Net increase in demand from historical:		**14,320**	**20,586**	**106,588**
Potential Future Water Budget Deficits[3]:		-38,487	-46,800	-135,982
Deficit from Historical Water Budget[4]:		-29,153	-29,153	-29,153
Combined Future Water Budget Deficits:		**-67,640**	**-75,953**	**-165,135**

[1] Table A Allocation and Article 21 water

[2] Baseline Conditions urban demand from WY 2013. Urban demand for 2030 based on area-weighted population growth (average 1.1% annually) and per capita water demand estimates from UWMPs (average 248 gpcd). Population growth rates for the County (0.8% annually) used for years 2040 through 2070.

[3] Sum of net decrease in SWP and net increase in demand from data in upper table.

*[4] Remaining average annual deficits from adjusted checkbook method of the historical water budget; see **Table 4-5**.*

As shown in **Table 4-14**, SWP water availability is projected to decline under baseline and both climate change conditions. Agricultural demand increases under climate change conditions as a result of higher potential evaporation and lower precipitation (i.e., hotter and drier conditions). Urban demand is projected to increase based on an increase in population and changes in per capita water demand, as documented in the individual UWMPs of the primary water purveyors. A decline in urban demand from baseline to 2030 conditions is due to a decrease in per capita water demand for future conditions as indicated in the UWMPs. Collectively, these projected supplies indicate potential water budget deficits of -38,487 AFY (Baseline), -46,800 AFY (2030 Climate Change), and -135,982 AFY (2070 Climate Change).

The methodology used to develop the projected increases in demand is conservative in that current land use is unchanged. The increases in urban demand listed in **Table 4-14** are controlled by population growth projections for the future. A portion of the City's growth could convert agricultural lands to urban use, resulting in a double-counting of demands in **Table 4-14**. Based on recent trends of urbanization, conversion of about 10,000 acres of agricultural lands (about 10 percent of total agriculture in the KRGSA) to urban use is estimated to occur over the planning horizon, providing an agricultural demand reduction. To account for this land use conversion in the projected water budgets, a decrease in agricultural demand of about 27,000 AFY (i.e., 2.7 AF/acre) is included as a project in this GSP (see **Section 7.1.4**). Accordingly, no changes for this demand reduction are made for purposes of the climate change baseline analyses.

Also, as shown on **Table 4-14**, previously-identified checkbook deficits from the historical water budget are added to the future projected water budgets. Specifically, a deficit of about -29,153 AFY was estimated for an adjusted checkbook analysis that removed banking, recharge, and other activities in the KRGSA Plan Area that were attributable to others from the historical water budget (see **Section 4.4.2** and **Table 4-5**). This historical water budget deficit is added to the projected baseline deficits (38,487 AFY) and the 2030 and 2070 Climate Change deficits (-46,800 AFY and -135,982 AFY in **Table 4-14)**, resulting in combined potential future water budget deficits of -67,640, -75,953 AFY and -165,135 AFY for the three baseline conditions. Again, these deficit estimates are computed on a checkbook basis and do not account for subsurface flows or banking in the KRGSA conducted by others. Nonetheless, they represent maximum estimated future deficits for planning purposes.

Kern River supply is not included in **Table 4-14** because it is not associated with a significant future deficit. Although there are projected changes in the monthly timing and flows for the Kern River under both 2030 and 2070 Climate Change conditions, the total average annual flows in the River are not expected to decline significantly. Specifically, GEI consultants analyzed projected future changes in the monthly unregulated River flows at First Point to assist with setting up the climate change analysis in the C2VSimFG-Kern model. GEI used DWR monthly and annual runoff change factors for the contributing watersheds and re-calculated local runoff. These estimates predict a significant decrease in summer flows between April and September and a corresponding projected increase in flows from October through March. However, overall projected changes in the total annual flow volumes are less than one percent (99.6 percent for 2030 condition and 99.4 percent for 2070 conditions). Further, the change in timing of flows can be managed by KRGSA diverters for optimal Kern River use.

The potential decreases in supply and increases in demand in **Table 4-14** are used to develop appropriate projects and management actions that target a sustainable water budget. Projects and management actions are described in **Section 7** of this GSP.

The potential deficits projected in **Table 4-14** for the 2030 Climate Change conditions occur only 10 years after GSP implementation in 2020 and are within the window for achieving sustainability. Accordingly, those conditions are the focus of the priority GSP projects. It is recognized that the 2070 Climate Change conditions are less certain, given the long-term 50-year implementation and planning horizon. As part of the GSP, future Annual Reports and five-year GSP evaluations will be used to update these potential projected deficits when more detailed information from the KRGSA water budgets will be available. During those re-evaluations, the GSP will be adapted as needed to maintain sustainable groundwater management.

4.7.3 Projected Water Budget Results for the KRGSA Plan Area

Projected water budgets were analyzed based on the conditions described above for baseline, 2030 Climate Change, and 2070 Climate Change scenarios. Based on the checkbook estimate of water budget deficits described above, three GSP water supply projects and one demand reduction project were developed to erase those deficits. Those four projects – the KDWD Water Allocation Plan, the City Kern River Conjunctive Use Optimization, the City Expansion of Recycled Water Use and Urbanization of Agricultural Lands – are all scheduled to begin implementation in Phase One (by 2025) with benefits realized by 2030; projects are described in more detail in **Sections 7.1.1**, **7.1.2**, **7.1.3**, and 7.1.4, respectively. As documented in **Section 7.1**, these four projects are sufficient to eliminate potential future deficits for both baseline and the 2030 Climate Change scenarios using the checkbook water budget methodology. Projects were demonstrated to meet all estimated future deficits when analyzed with the C2vSimFG-Kern model, as described in the sections below.

4.7.3.1 Projected Water Budget Change in Groundwater in Storage

Model input files were developed for the Phase One GSP projects affecting water supply or demand and simulated with the C2VSimFG-Kern model for each of the three baseline/climate change scenarios. Model results demonstrate the ability for GSP projects to offset deficits, avoid future overdraft conditions, and prevent undesirable results. In total, six model simulations were developed, one for each of the three baselines/climate change scenarios with and without projects. Model results over the Planning Horizon WY2041 through WY2070 are summarized in **Table 4-15**; annual model results are presented in **Appendix H** for the entire 50-year Implementation and Planning horizon. Model results in **Appendix H** include three simulations that impose GSP projects on each of the three baseline conditions. The change in groundwater in storage for each of the three simulations in **Appendix H** are summarized in the second column of **Table 4-15**.

Table 4-15: Future Projected Water Budget Model Results

Water Budget Scenario	Change in Groundwater in Storage*	Adjustments for Model Limitations		Adjusted Change in Groundwater in Storage
		Excess Kern River Outflow from Model	Banking Obligations for Export from Subbasin**	
AFY	AFY	AFY	AFY	AFY
Baseline	-13,395	0	-6,714	-20,109
Baseline with Projects	47,404	12,629	-6,714	53,319
2030 Climate Change	-16,309	4,680	-6,548	-18,177
2030 with Projects	45,183	21,476	-6,548	60,111
2070 Climate Change	-33,421	9,371	-6,217	-30,267
2070 with Projects	29,111	27,854	-6,217	50,748

**Model results with projects demonstrate sustainability over the Planning Horizon WY2041 through WY2070.*
*** Only water banked for export from the Subbasin is included in this adjustment to preserve the overall Subbasin water budget simulated in the model. As explained in **Section 4.4.2**, additional banking obligations, as well as credits, are applicable for adjustments in the KRGSA using the checkbook method.*

The change in groundwater in storage for each model run in the second column of **Table 4-15**, requires adjustments due to model limitations. Specifically, the model is not optimized to simulate Kern River management and cannot account for all of the recharge from the Kern River; that is, the model indicates baseflow beneath the western banking projects (west of the KRGSA) where no baseflow occurs. This excess Kern River outflow from the model requires manual adjustment for the amount of recharge that is not captured by the model; those amounts are tabulated and summarized in the third column of **Table 4-15**.

An additional adjustment is made in the fourth column of **Table 4-15** involving a correction for the banking obligations in the KRGSA that are dedicated for subsequent export out of the Subbasin. Such obligations will add to water budget deficits when exported. This adjustment has to be made outside of the model to preserve the physical inflows and outflows to the groundwater system. By adjusting for only the banked water that will be exported from the Subbasin, the overall Subbasin water budget is preserved. (As indicated by the footnote below **Table 4-15**, this banking adjustment does not account for all of the banking complexities within the KRGSA; these are discussed in more detail below).

The resulting adjusted change in groundwater in storage is provided in the last column of **Table 4-15**. Adjusted model results are shown graphically on **Figure 4-7** for the 70-year implementation and planning horizon. Changes of groundwater in storage are illustrated on a cumulative basis for the six model runs summarized on **Table 4-15** (note that the units on **Figure 4-7** are in thousands of AF). Results in **Table 4-15** and **Figure 4-7** demonstrate the ability of the GSP projects to achieve sustainability within the KRGSA during the implementation period and to maintain sustainability throughout the planning horizon.

As shown in **Table 4-15**, the baseline/climate change deficits indicated from the modeling (i.e., -20,109 AFY, -18,177 AFY, and -30,267 AFY) are smaller than estimated previously in **Table 4-14** by the checkbook method. This is due to the differences between a numerical model method (**Table 4-15**) and a checkbook method (**Table 4-14**). First, subsurface flows occur dynamically in the groundwater model and are not included in the checkbook approach. Second, banking recharge conducted within the KRGSA by others is included in the model but not in the checkbook. This is appropriate because the model represents the physical groundwater system, yet this inclusion of others' banked water in the checkbook could over-estimate water available to the KRGSA.

Notwithstanding these subsurface flows and banking complications, GSP projects clearly provide sufficient increased water supply and decreased demand to eliminate both checkbook and adjusted model deficits and fully mitigate potential future overdraft. Volumes of water associated with Phase One GSP projects to address deficits from baseline and 2030 climate change conditions are summarized on **Table 7-1** and documented in **Sections 7.1.1**, **7.1.2, 73.1.3**, and **7.1.4**.

4.7.3.2 Future Projected Model Hydrographs

Model results also indicate that GSP projects are sufficient to eliminate undesirable results during the implementation period and avoid them throughout the planning horizon. This was tested by the model using preliminary representative monitoring well locations as shown on **Figure 4-8**. Initial sustainable management criteria (including minimum thresholds and measurable objectives[26]) were selected for these wells (as described in **Section 5**). As described in more detail in **Attachment 1**, the model was set up to simulate water level response to GSP projects at these wells and predict whether levels could be maintained above the selected minimum thresholds[27]. These hydrographs were constructed using the principle of superposition and began with observed water levels in Spring 2015.

Eight model hydrographs were selected to illustrate how water levels are predicted to respond to GSP projects; four hydrographs were selected in the northern KRGSA Plan Area and four in the southern KRGSA Plan area as highlighted on **Figure 4-8**. Remaining superposition hydrographs for the GSP monitoring wells on **Figure 4-8** are included with more detailed model results in **Appendix H**.

Hydrographs from the northern and southern Plan Area are presented on **Figures 4-9** and **4-10**, respectively. Dark blue and black lines are used for the three baseline scenarios without projects (i.e., Baseline and the 2030 and 2070 Climate Change scenarios); magenta (solid and dashed) and yellow lines represent the three baseline scenarios with Projects. The initial minimum threshold is shown as a red line and labeled on each hydrograph; the measurable objective is shown in green.

Hydrographs from the northern Plan Area on **Figure 4-9** includes a northern well in agricultural areas (**Figure 4-9a**), two wells near the municipal wellfields of north-central Plan Area (**Figures 4-9b** and **4-9d**),

[26] These thresholds are defined and discussed in detail in **Section 5**.

[27] Some minimum thresholds have been adjusted slightly since modeling was completed but adjustments are not sufficient to change the conclusions of the model results.

and a well in the banking area (**Figure 4-9c**) (see locations on **Figure 4-8**). With the exception of the banking area hydrograph (**Figure 4-9c**), all hydrographs show the overall declining trend in the baseline/climate change scenarios and an overall positive trend when the GSP projects are simulated. The banking area hydrograph doesn't illustrate these trends because of the banking operations whereby recharge occurs in wet years followed by pumping of an equal or lesser amount in dry years. Given this operation, local KRGSA banking projects do not contribute to overdraft. Although water levels fluctuate more significantly in response to these operations, model results indicate that water levels can be maintained above the minimum threshold to avoid undesirable results. In the southern KRGSA Plan Area, four wells (**Figures 4-10a** through **4-10d**) also illustrate the declining trends of the projected baselines and the rising water levels associated with GSP projects.

Collectively, these model scenarios indicate that the KRGSA projects described in **Section 7** are sufficient to address future water budget deficits and to meet GSP minimum thresholds as described in **Section 5**.

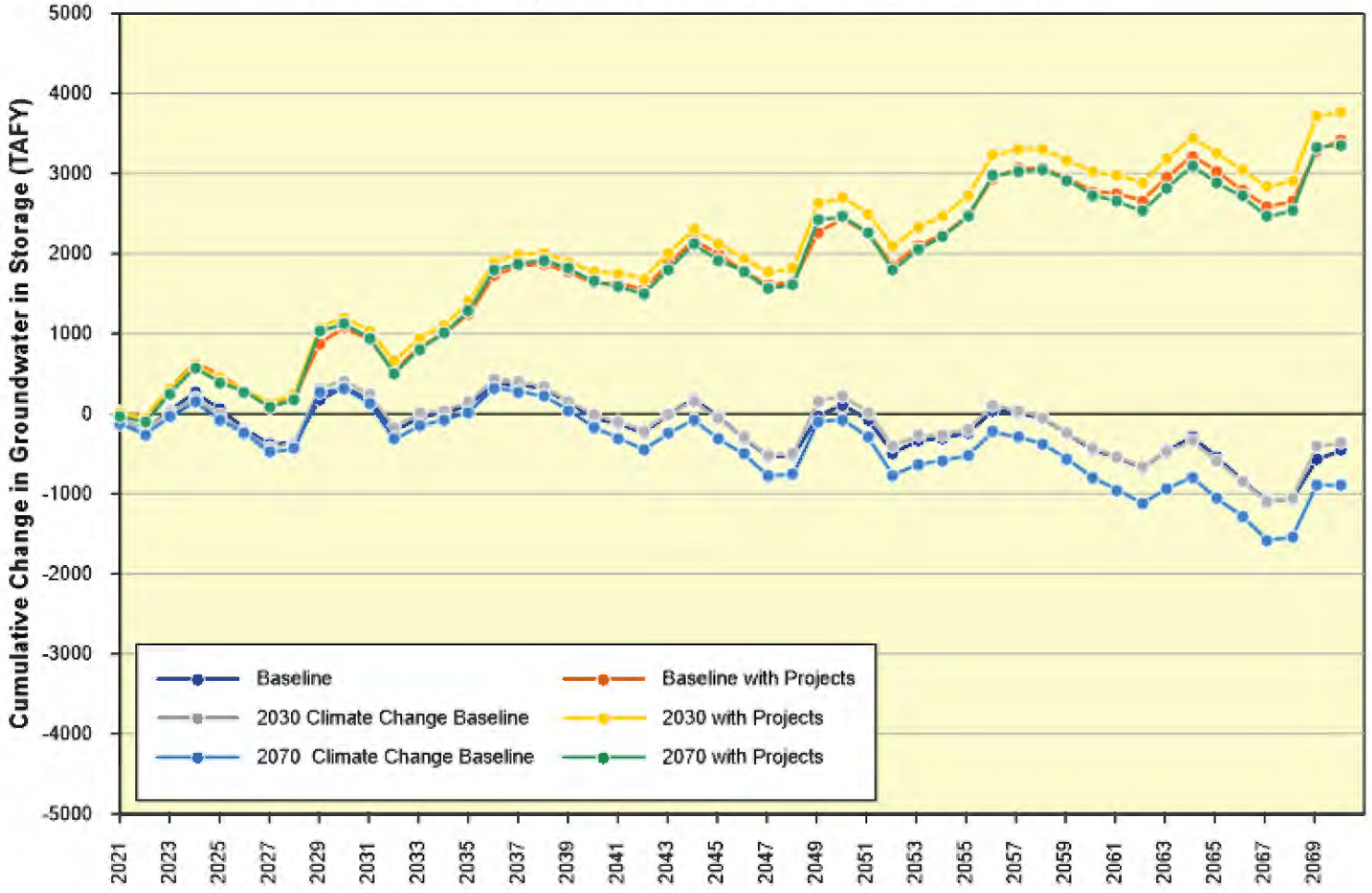
4.8 Data and Knowledge Gaps for the Water Budget Analysis

As described above, surface water and groundwater components of the water budget analysis represent measured, estimated, and/or inferred amounts of water, each associated with an increasing level of uncertainty. Some uncertainty associated with missing or incomplete historical data cannot be addressed simply due to an absence of information; however, these missing data may not represent significant levels of "uncertainty" or a "data gap" as defined by SGMA. Both of these terms are defined in the regulations as representing significant unknowns that would affect the ability to assess whether a basin is being sustainably managed. For the water budget, the data gap analysis focuses on the larger water budget components that would likely affect the efficacy of Plan implementation or the ability to assess future sustainable management.

Surface water inflows represent mostly measured and well-documented values including Kern River flow, diversions, and deliveries, importation of SWP water, and wastewater deliveries. Groundwater banking amounts are also based on measured deliveries.

Municipal pumping, including several small water systems, is also measured via well meters. Although some estimates were required to fill incomplete historical data, these estimates are considered reasonable because they are based on other relatively accurate datasets such as population, water demands, and metered data covering similar time intervals. Pumping totals within the ID4 service area represent both metered and estimated data but are reported and recorded semi-annually by a public agency; accordingly, these data are considered reasonably accurate for the purposes of the water budget. The largest pumpers in ID4 have metered data, as do some smaller industrial pumpers and other water users. Most of the private and domestic pumping in the northern Plan Area is estimated, however, amounts are relatively small and would not significantly affect the water budget analysis.

Evaporative loss along the River is estimated based on measured reference evapotranspiration and observed vegetative conditions and considered sufficient for the water budget purposes. Estimates of

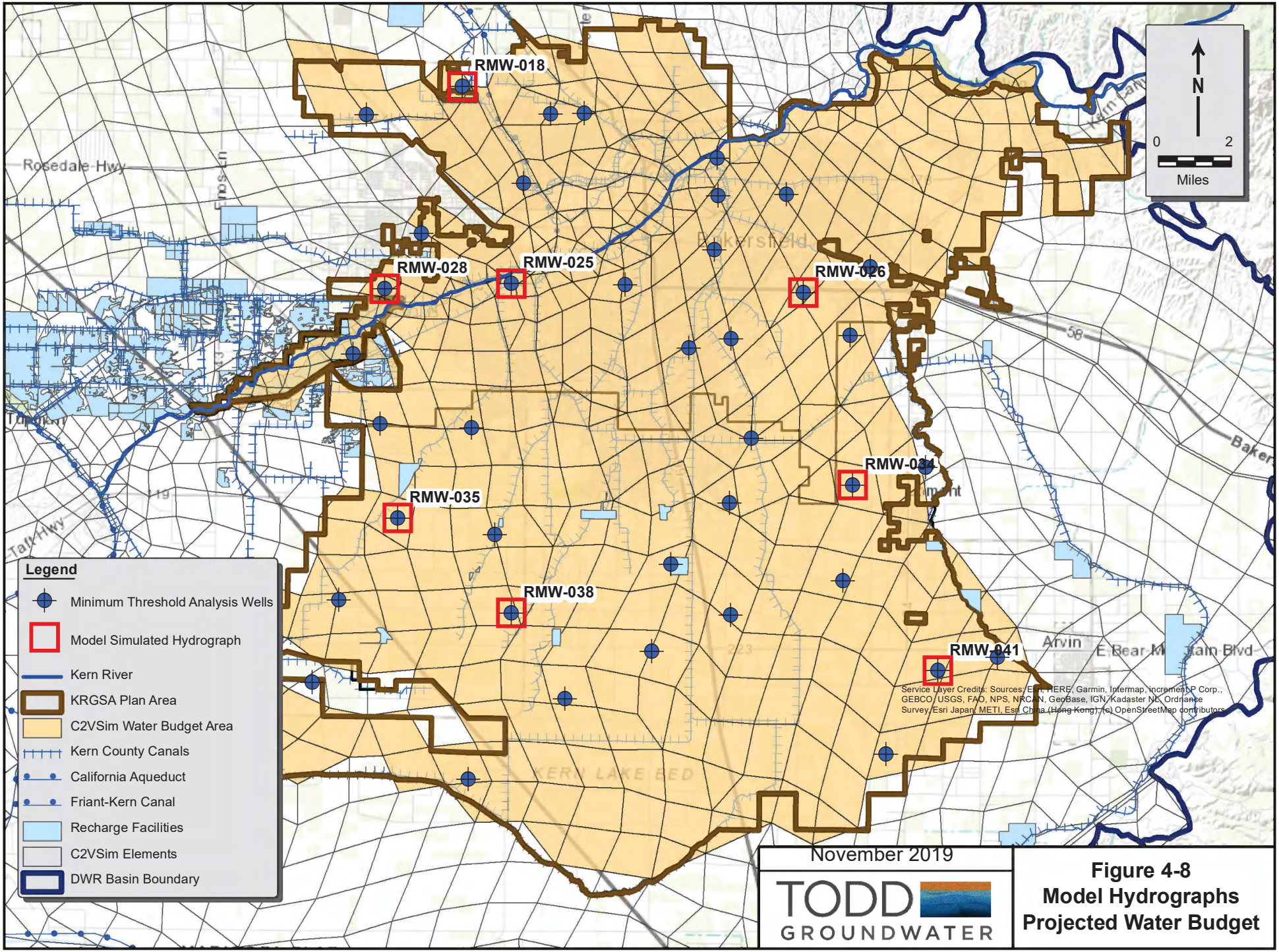


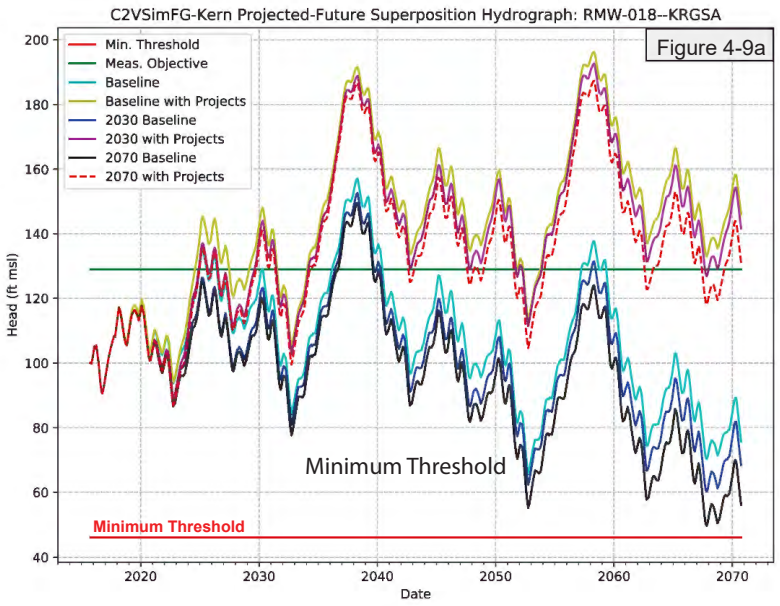
Future Projected Water Budget as simulated with C2VSimFG-Kern model and adjusted for excess model outflow and banking obligations for Subbasin export.

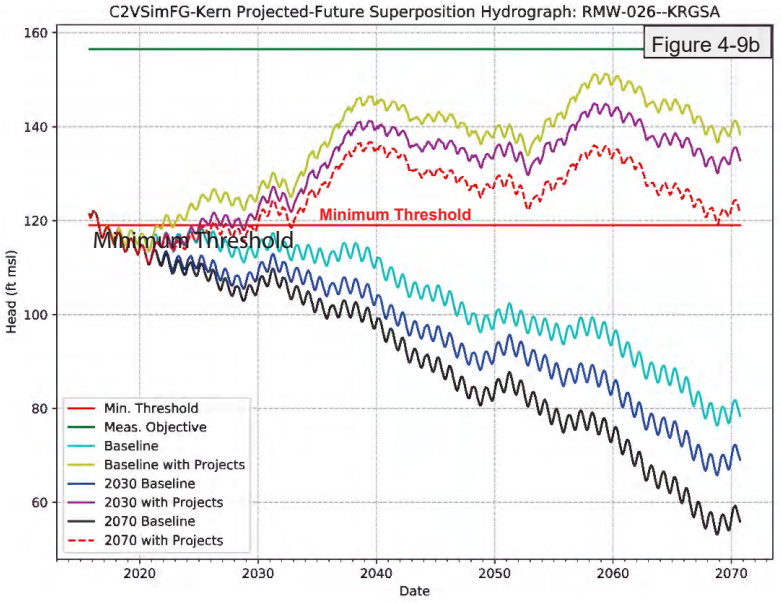
November 2019

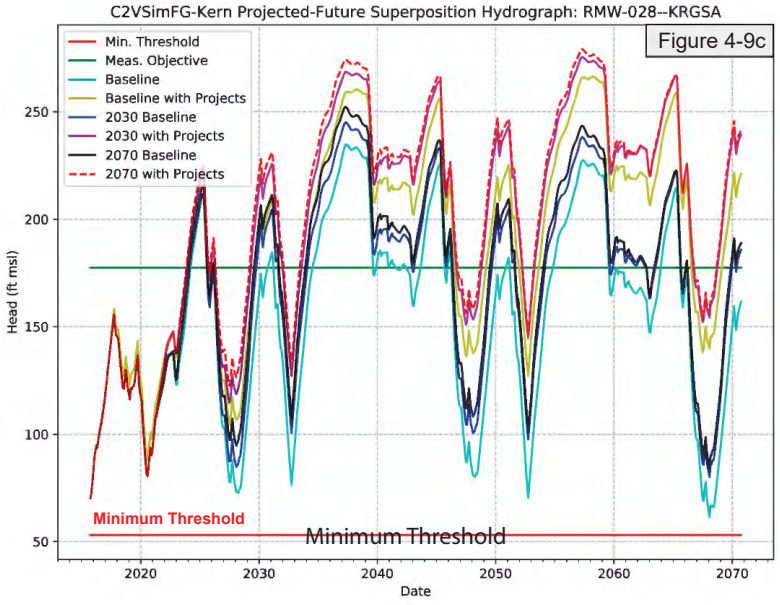
TODD GROUNDWATER

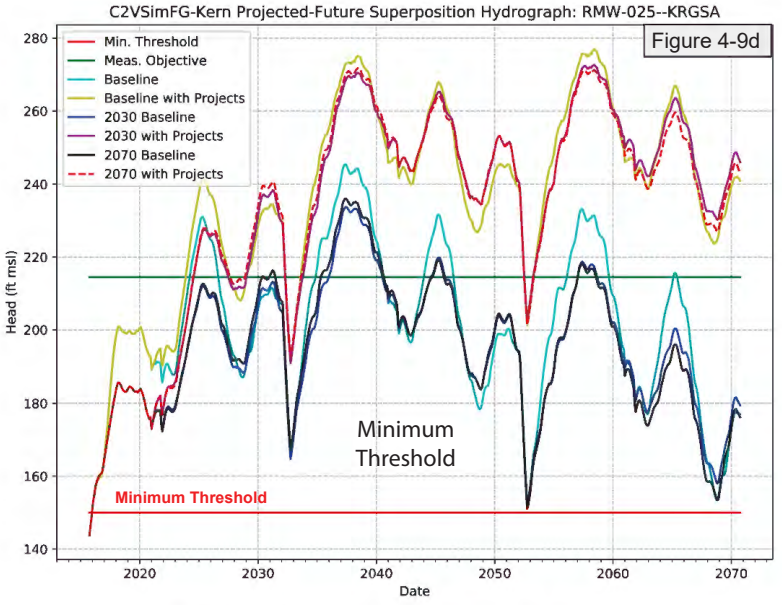
Figure 4-7
Future Projected Change in Groundwater in Storage


RMW-018
RMW-028
RMW-025
RMW-026
RMW-034
RMW-035
RMW-038
RMW-041
Rosedale Hwy
Bakersfield
Arvin
N
0
2
Miles
Legend
Minimum Threshold Analysis Wells
Model Simulated Hydrograph
Kern River
KRGSA Plan Area
C2VSim Water Budget Area
Kern County Canals
California Aqueduct
Friant-Kern Canal
Recharge Facilities
C2VSim Elements
DWR Basin Boundary
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors
November 2019
TODD GROUNDWATER
Figure 4-8
Model Hydrographs
Projected Water Budget





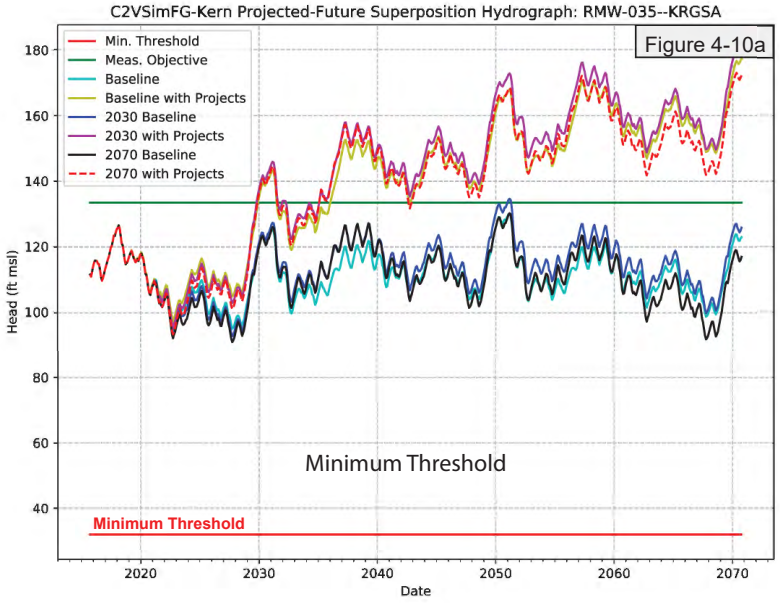


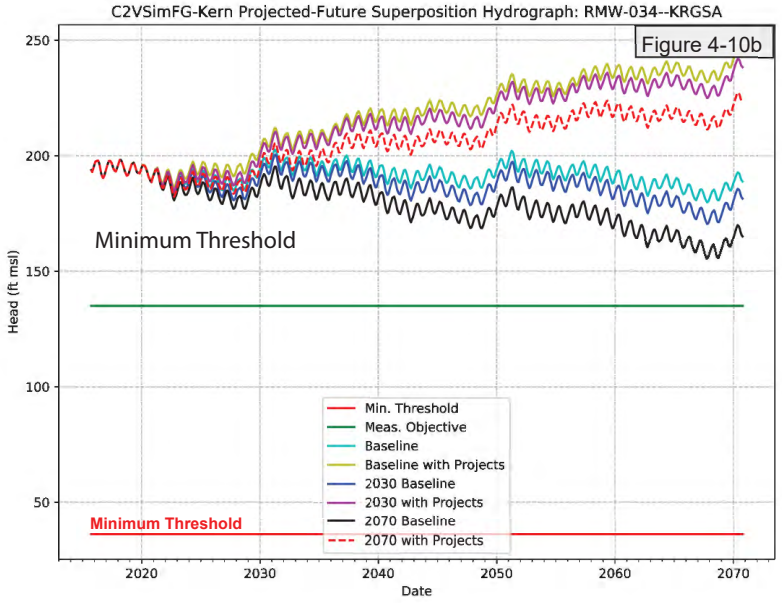


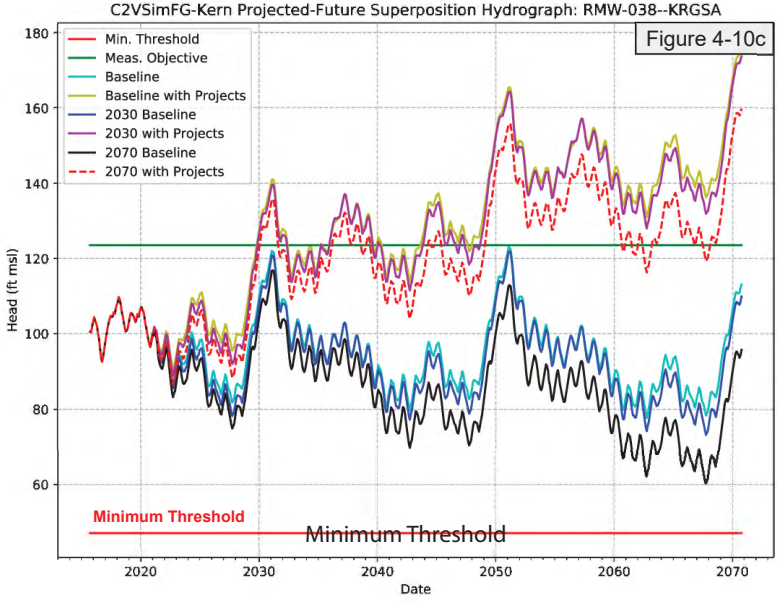
November 2019

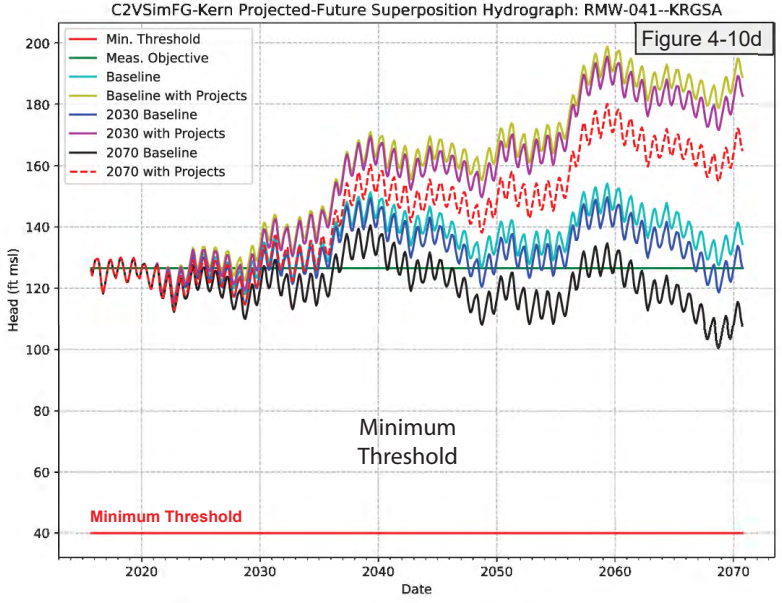
TODD GROUNDWATER

Figure 4-9
Projected Water Levels
Northern Plan Area









November 2019

TODD GROUNDWATER

Figure 4-10
Projected Water Levels
Southern Plan Area

Appendix D:

Table 2-2 from Kern River Flow and Municipal Water Program EIR

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Table 2-2. City of Bakersfield Current Minimum Obligations and Kern River Yields

	Quantity (TAF)												Total Annual (TAF)
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	
City Water Obligations													
Water Treatment Plants	0.5	1.7	1.5	1.3	1.6	2	2.1	2.1	2	1.6	1.4	1	19
Kern River Canal & Irrigating Company (KRC&I)	0.05	0.15	0.45	0.8	1.05	1.10	1.10	1.10	0.73	0.30	0.15	0.03	7
Olcese Water District	0.02	0.05	0.08	0.10	0.12	0.13	0.13	0.13	0.13	0.08	0.03	0.02	1
City Water Feature Amenities [c]	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	5
Miller-Haggin Obligations + Isabella Evaporation Losses, and Preexisting Delivery Obligations [b]	0	0	3.3	3.3	3.3	3.3	3.3	3.3	0	0	0	0	20
Long-Term Sale to Rosedale-Rio Bravo Water Storage District	3.4	3.3	3.3	0	0	0	0	0	0	0	0	0	10
Current Minimum Obligations	4.4	5.6	9.1	5.9	6.5	7.0	7.1	7.1	3.3	2.4	2.0	1.5	62
Kern River Water Yield (1954–2010)													
City Historic Rights [a]													
Median Year	1.1	1.1	16.1	18.4	22.5	20.1	9.9	0.7	0	0	0.1	0.4	90
Average Year (mean)	1.5	1.7	17.1	19.7	28.3	25.2	14.2	5.9	0.4	0.3	0.4	1.1	116
Dry Year (25th percentile)	0.3	0.8	8.0	13.6	16.3	11.3	1.8	0	0	0	0	0	52
Wet Year (75th percentile)	1.4	1.3	24	24.8	36.4	31.9	19.9	11.4	0.9	0.7	0.8	1.1	155
Kern River Canal & Irrigating Company (KRC&I) Laterals													
Median Year	0	0	0	0.8	3.5	2.5	0	0	0	0	0	0	7
Average Year (mean)	1.2	1.3	0.5	2	4.7	3.7	1.1	0.3	0.2	0	0.2	1	16
Dry Year (25th percentile)	0	0	0	0.1	1.3	0.4	0	0	0	0	0	0	2
Wet Year (75th percentile)	0.7	0.5	0.8	3.4	7.2	5.8	1.6	0	0	0	0	0	20
Old South Fork Right													
Median Year	0.5	0.5	0	0.2	0.3	0.2	0.1	0	0	0	0.1	0.2	2
Average Year (mean)	0.4	0.4	0.1	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.3	3
Dry Year (25th percentile)	0.1	0.4	0	0.1	0.2	0.1	0	0	0	0	0	0	1
Wet Year (75th percentile)	0.6	0.6	0.1	0.3	0.3	0.3	0.2	0.1	0.5	0.3	0.4	0.6	4
Total Historic City Water Yield: *Sum of City Base, KRC&I Laterals, and Old South Fork Deliveries*													
Median Year	1.6	1.6	16.2	19.4	26.4	22.8	10	0.7	0.1	0	0.2	0.5	99
Average Year (mean)	3	3.5	17.7	21.9	33.3	29.2	15.5	6.4	0.8	0.5	0.8	2.4	135
Dry Year (25th percentile)	0.4	1.2	8	13.8	17.8	11.8	1.8	0	0	0	0	0.1	55
Wet Year (75th percentile)	2.7	2.3	24.9	28.5	44	38	21.7	11.6	1.4	1	1.2	1.7	179

Table 2-2. *(continued)* City of Bakersfield Current Minimum Obligations and Kern River Yields

	Quantity (TAF)												Total Annual (TAF)
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	

Notes: TAF = thousand acre-feet
(a) Water deliveries do not include water released by other rights holders or the City of Bakersfield.
(b) Miller-Haggin Obligations include river channel and canal recharge to make deliveries to first point canals below the Kern Island right and to deliver second point water and lower River water to second point undiminished during the March-August period. Preexisting delivery obligations are from agreements assumed by the City upon the City's purchase of Kern River water rights. These include agreements with Kern County for Isabella Recreation Pool, Lake Ming, and Hart Park. Other year to year miscellaneous water sales are not included in the City Existing Water Obligations.
(c) City Water Feature Amenities = Truxtun Lakes, The Park at RiverWalk, Aera Park Pond, Wilson Ponds, etc.
Note: This table is reproduced in Chapter 3, Section 3.7 "Water Supply and Groundwater Resources" as Table 3.7-1

Appendix E:

City of Bakersfield Municipal Code Chapters:

- Chapter 12.28 – Water in Gutters or Sidewalks
- Chapter 14.02 – Water Use Regulations
- Chapter 14.04 – City Domestic Water Service Area

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Chapter 12.28
WATER IN GUTTERS OR SIDEWALKS

Sections:

12.28.010 Hose or water pipe on public way unlawful.
12.28.020 Water on sidewalks unlawful—Exception.
12.28.030 Allowing irrigation water to overflow into gutters unlawful.
12.28.040 Duty to turn off water before it overflows into gutters.

12.28.010 Hose or water pipe on public way unlawful.

Any person leaving or permitting to be left any hose or water pipe upon or across any sidewalk, sidewalk space or any public passageway, within the city, between the hours of nine p.m. and six a.m., shall be punished as set forth in general penalty provision Section 1.40.010. (Ord. 3434 § 1, 1996; prior code § 10.07.090)

12.28.020 Water on sidewalks unlawful—Exception.

Any person owning or having in his possession any water pipe, drain or hose and who permits the water therefrom to run across any sidewalk, public street or alleyway, so as to injure the same or obstruct or interfere with the free travel thereon, or who permits said water to run into or upon the surface of the street, shall be punished as set forth in general penalty provision Section 1.40.010, excepting, however, that it is not unlawful to use a reasonable amount of water to clean any sidewalk or portion thereof within the city. (Ord. 3434 § 2, 1996; prior code § 10.07.070)

12.28.030 Allowing irrigation water to overflow into gutters unlawful.

It is unlawful for the owner, agent or tenant of any dwelling house, apartment house, flat building or any building or premises in the city where water is used to irrigate or sprinkle the lawn or plants on or about said premises to allow the water so being used to run, or for such person to sprinkle said premises until the water floods the parking space between the sidewalk and the curb and overflows into the gutter and street. (Prior code § 8.56.010)

12.28.040 Duty to turn off water before it overflows into gutters.

It shall be the duty of all owners, agents or tenants of dwelling houses, apartment houses, flat buildings and all such premises where water is used to irrigate or sprinkle the lawn and plants on or about said premises, to shut or turn off all water before the same runs over the curb in front of said premises and into the gutter and street. (Prior code § 8.56.020)

The Bakersfield Municipal Code is current through Ordinance 5051, passed May 19, 2021.

Disclaimer: The city clerk has the official version of the Bakersfield Municipal Code. Users should contact the city clerk for ordinances passed subsequent to the ordinance cited above.

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Chapter 14.02
WATER USE REGULATIONS

Sections:

14.02.010 Outside irrigation restrictions.
14.02.020 Penalty.
14.02.030 Administrative citation.
14.02.035 Administrative fines.
14.02.040 Administrative citation review process.
14.02.045 Administrative hearing officer.

14.02.010 Outside irrigation restrictions.

A. Outside irrigation of ornamental landscapes or turf with potable water is allowed in accordance with the rules and regulations promulgated by the State Water Resources Control Board relative to water usage.

B. Outside irrigation in a manner that causes water to flow onto adjacent property, nonirrigated areas, sidewalks, and/or gutters is strictly prohibited.

C. Outside irrigation is advised to be done after six p.m. and before nine a.m. for optimal efficiency.

D. In addition to the above, commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, shall immediately implement water efficiency measures to reduce potable water usage in an amount consistent with the reduction targets of the State Water Resources Control Board as amended from time to time.

E. All irrigation and landscaping projects shall adhere to that certain Model Water Efficient Landscaping Ordinance known and designated as California Code of Regulations, Title 23, Chapter 2.7 as adopted by the state and as pursuant to Chapter 17.61 of this code, Landscape Standards. (Ord. 5035 § 1, 2020; Ord. 4915 § 1, 2017; Ord. 4830 § 1, 2015; Ord. 4804 § 2, 2015)

14.02.020 Penalty.

Failure to comply with these regulations may be punishable as an infraction, or misdemeanor pursuant to Bakersfield Municipal Code Section 1.40.010, an administrative citation pursuant to Bakersfield Municipal Code Section 14.02.030, or any other available remedies allowed by law. (Ord. 4830 § 1, 2015; Ord. 4804 § 2, 2015)

14.02.030 Administrative citation.

A. Whenever an enforcement officer charged with the enforcement of this chapter determines that a violation of a provision has occurred, the enforcement officer shall have the authority to issue an administrative citation to any person responsible for the violation. Said enforcement officer shall be a trained employee from the city's water department.

B. Each administrative citation shall contain the following information:

1. The date of the violation or, if the date of the violation is unknown, then the date the violation is identified;

2. The address or a definite description of the location where the violation occurred;

3. The section of the code violated and a description of the violation;

4. The amount of the fine and how to pay it;

5. A description of the administrative citation review process;

6. An order prohibiting the continuation or repeated occurrence of the code violation described in the administrative citation; and

7. The name and signature of the citing enforcement officer.

C. The fine shall be paid to the city within thirty days from the date of the administrative citation; payment of a fine under this section shall not excuse or discharge any continuation or repeated occurrence of the code violation that is the subject of the administrative citation.

D. The city may collect any past due administrative citation fine by use of all available legal means. (Ord. 4830 § 1, 2015)

14.02.035 Administrative fines.

A. The fines for violation of this chapter shall be as follows:

1. Fifty dollars for the first offense, one hundred fifty dollars for the second offense, and two hundred fifty dollars to one thousand dollars for each subsequent offense in a calendar year.

B. Any administrative citation fine paid pursuant to subsection A shall be refunded if it is determined, after a hearing, that the person charged in the administrative citation was not responsible for the violation or that there was no violation as charged in the administrative citation. (Ord. 4830 § 1, 2015)

14.02.040 Administrative citation review process.

Any recipient of an administrative citation may appeal the citation by completing a request for hearing form and returning it to the city within thirty days from the date of the administrative citation, together with an advance deposit of the fine.

A. No appeal hearing to contest an administrative citation shall be held unless the fine has been deposited in advance.

B. An appeal hearing shall be set for a date that is not less than fifteen days and not more than sixty days from the date that the request for hearing is filed.

C. The appellant shall be notified of the time and place set for the hearing at least ten calendar days prior to the date of the hearing.

D. At the hearing, the appellant shall have the opportunity to testify and to present evidence concerning the administrative citation.

E. The failure of the appellant to appear at the appeal hearing shall constitute a forfeiture of the fine and a failure to exhaust their administrative remedies.

F. The administrative citation and any additional report submitted by the enforcement officer shall constitute prima facie evidence of the respective facts contained in those documents.

G. The hearing officer may continue the hearing and/or request additional information from the enforcement officer or the recipient of the administrative citation prior to issuing a written decision.

H. Any person aggrieved by an administrative decision of a hearing officer on an administrative citation appeal may obtain review of the administrative decision by filing a petition for review with the Kern County Superior Court in accordance with the timelines and provisions set forth in California Government Code Section 53069.4. (Ord. 4830 § 1, 2015)

14.02.045 Administrative hearing officer.

The city manager shall designate the hearing officer for the appeal hearing.

A. After considering all of the testimony and evidence submitted at the appeal hearing, the hearing officer shall issue a written decision to uphold or dismiss the administrative citation and shall list in the decision the reasons for that decision. The decision of the hearing officer shall be final.

B. If the hearing officer determines that the administrative citation should be upheld, the hearing officer may increase or decrease the fine amount. The appellant must pay the city any increased amount within thirty days of receiving the decision of the hearing officer.

C. If the hearing officer determines that the administrative citation should be dismissed or the fine reduced, the city shall refund the appropriate amount of the deposited fine within thirty days.

D. The employment, performance evaluation, compensation and benefits of the hearing officer shall not be directly or indirectly conditioned upon the amount of administrative citation fines upheld by the hearing officer. (Ord. 4830 § 1, 2015)

The Bakersfield Municipal Code is current through Ordinance 5051, passed May 19, 2021.

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Chapter 14.04
CITY DOMESTIC WATER SERVICE AREA

Sections:

14.04.010 Definitions.
14.04.011 Establishment of city domestic water service area.
14.04.020 Description of service.
14.04.030 Application for service.
14.04.040 Contracts.
14.04.050 Special information on forms.
14.04.060 Establishment and reestablishment of credit.
14.04.070 Deposits required.
14.04.080 Notices.
14.04.090 Rendering and payment of bills.
14.04.100 Disputed bills.
14.04.110 Conditions for discontinuance—Restoration of service—Fees.
14.04.120 Rates and fees.
14.04.130 Temporary service.
14.04.140 Main extensions—General provisions—Applicability.
14.04.150 Main extensions—General provisions—Definitions.
14.04.160 Main extensions—General provisions—Ownership, design and construction of facilities.
14.04.170 Main extensions—General provisions—Estimates, plans, and specifications.
14.04.180 Main extensions—General provisions—Timing and adjustment of advances.
14.04.190 Main extensions—General provisions—Assignment of main extension contracts.
14.04.200 Main extensions—Serving subdivisions, tracts, housing projects, industrial developments or organized commercial districts—Advances.
14.04.210 Main extensions—Serving subdivisions, tracts, housing projects, industrial developments or organized commercial districts—Refunds.
14.04.220 Main extensions—Serving subdivisions, tracts, housing projects, industrial developments or organized commercial districts—Termination of contracts.
14.04.230 Main extensions—Serving subdivisions, tracts, housing projects, industrial developments or organized commercial districts—Extensions including fire protection.
14.04.240 Service connections, meters and customers' facilities—Installation.
14.04.250 Service connections, meters and customers' facilities—Ownership.
14.04.260 Service connections, meters and customers' facilities—Installation and maintenance responsibility.
14.04.270 Service connections, meters and customers' facilities—Right of access to customers' premises.
14.04.280 Service connections, meters and customers' facilities—Compensation to city's employees.
14.04.290 Service connections, meters and customers' facilities—Responsibility for loss or damage.

14.04.300 Service connections, meters and customers' facilities—Water wastage.
14.04.310 Service connections, meters and customers' facilities—Customers' responsibilities precedent to receiving service.
14.04.320 Service connections, meters and customers' facilities—Ground wire attachments.
14.04.330 Meter tests and adjustment of bills.
14.04.340 Service to separate premises and multiple units—Resale of water.

14.04.010 Definitions.

For the purposes of this chapter, the following words shall have the meanings as set forth in this section:

A. "Applicant" means the person, corporation, partnership or other agency applying for water service.

B. "Business service" means provision of water for use in connection with commercial premises devoted primarily to operations for profit including offices, stores, markets, apartments, hotels, motels, automobile trailer parks or courts, service stations and the like.

C. "City" means the city and department of water, or California Water Service Company, agent.

D. "Customer" means any person, association, corporation, partnership or other agency of record supplied with water service from the city.

E. "Date of presentation" means the date upon which a bill or notice is mailed or delivered by the city to the customer.

F. "Industrial service" means provision of water to industrial premises where the water is used primarily in manufacturing or processing activities.

G. "Irrigation service" means provision of water for commercial agriculture, floracultural or horticultural use and billed under distinct irrigation rates.

H. "Main extensions" means the extension of water distribution mains beyond existing facilities in accordance with the provisions of the rule applicable to main extensions filed as part of these tariff schedules.

I. "Metered service" means service for which the charges are computed on the basis of measured quantities of water.

J. "Premises" means the integral property or area, including improvements thereon, to which water service is, or is to be, provided.

K. "Rates" means the rate or charge for water use.

L. "Residential service" means provision of water for household purposes, including water used on the premises for sprinkling lawns, gardens and shrubbery; washing vehicles; and other similar and customary purposes pertaining to single-family or multiple-family dwelling.

M. "Service connection" means service pipe and meter (where applicable) from the distribution pipeline to the nearest curb or property line adjacent to a dedicated public street or to a public utility easement available for use by the city.

N. "Service pipe" means the connection between the city's mains and the service connection, including all of the pipe, fittings and valves necessary to make the connection. (Prior code § 1.46.010)

14.04.011 Establishment of city domestic water service area.

There is established the city domestic water service area, the boundaries and service area of which shall be determined by the council by resolution, which resolution may be amended from time to time. (Ord. 4750 § 2, 2013; Ord. 2997 § 1, 1985)

14.04.020 Description of service.

A. *Quantities.* The city will endeavor to supply water dependably and safely in adequate quantities to meet the reasonable needs and requirements of customers.

B. *Pressures.* The city will endeavor to maintain normal operating pressures of not less than forty pounds per square inch nor more than one hundred twenty-five pounds per square inch at the service connection, except that during periods of hourly maximum demand the pressure at the time of peak seasonal loads may not be less than thirty pounds per square inch and that during periods of hourly minimum demand the pressure may not be more than one hundred fifty pounds per square inch. Variations in pressure under normal operation will not exceed fifty percent of the average operating pressure. (The average operating pressure will be determined by computing the arithmetical average of at least twenty-four consecutive hourly pressure readings.)

C. *Quality.* Whenever furnished for human consumption or for domestic uses, the city will endeavor to provide water that is wholesome, potable, in no way harmful or dangerous to health, and, insofar as practicable, free from objectionable odors, taste, color and turbidity.

D. *Nonliability.* The city shall not be liable for injury or damage to either persons or property resulting from failure to supply either adequate quantity, quality or pressure of the water supplied pursuant to these rules or pursuant to any contract hereunder. Acceptance of service by any customer shall constitute waiver of such liability. (Ord. 2660 § 2, 1981; prior code § 1.46.020)

14.04.030 Application for service.

A. *Application for Service.*

1. All persons, corporations, partnerships, agencies or entities of every type or kind shall make an application for water service on form provided by the city.

2. The application is merely a written request for service and does not bind the applicant to take service for a period of time longer than that upon which the rates and minimum charge of the applicable rate schedule are based; neither does it bind the city to serve, except under reasonable conditions.

B. *Individual Liability for Joint Service.* Two or more parties who join in one application for service shall be jointly and severally liable for payment of bills and shall be billed by means of single periodic bills.

C. *Change in Customer's Equipment.* Customers making any material change in the size, character or extent of the utilizing equipment or operations for which the city is supplying water service shall immediately give the city written notice of the extent and nature of the change.

D. *Use of Water Without Application for Service Having Been Made.* Any person or firm taking possession of and using water without having made application to the city for service shall be held liable for the full amount of the service rendered.

E. No application for water connection to the city-owned system shall be approved for an unincorporated area after the effective date of the ordinance codified in this section. (Ord. 5036 § 1, 2020; Ord. 4084 §§ 3, 4, 2002; Ord. 3560 § 1, 1993; Ord. 3504 § 1, 1992; prior code § 1.46.030)

14.04.040 Contracts.

A contract, as a condition precedent to receiving service from the city, will be required under any of the following circumstances:

A. Where required by provisions in a filed rate schedule;

B. When a main extension to be made under the provisions of Sections 14.04.140 through 14.04.230 requires an advance for construction;

C. For temporary service supplied under the provisions of Section 14.04.130;

D. For standby service or service requiring the payment of an availability fee;

E. For any service to be furnished at rates or under conditions other than the rates set by the city;

F. Under any circumstances where a contract would benefit the city and is directed to be prepared by the director of water resources. (Ord. 3504 § 2, 1992; prior code § 1.46.040)

14.04.050 Special information on forms.

A. *Contracts.* Each contract for water service will contain substantially the following provisions:

This contract shall at all times be subject to such changes or modifications by the City of Bakersfield as said city may, from time to time, direct in the exercise of its jurisdiction.

B. *Bill for Service.* On each bill for service there will be printed substantially the following language:

If this bill is not paid within fifteen (15) days after presentation, service may be liable to discontinuance. A cash deposit and a reconnection fee may be required to reestablish service.

Should the amount of this bill be questioned, an explanation should be requested from the city. If an explanation satisfactory to the customer is not made by the city and the bill is still questioned, the customer may deposit with the City of Bakersfield, City Treasurer, 1600 Truxtun Avenue, Bakersfield, California 93301, the amount of the bill to avoid discontinuance of service. Make remittance payable to City of Bakersfield and attach the bill and a statement setting forth the basis for the dispute of the amount of the bill. The Water Department will review the basis of the billed amount and disburse the deposit in accordance with its findings.

C. *Customer's Deposit Receipt.* Each receipt for cash deposit to establish or reestablish credit for service will contain the following statements:

1. Upon discontinuance of service, the city will refund the customer's deposit or the balance thereof in excess of unpaid bills for that service.

2. After the customer has, during the period of time the deposit is held or for twelve consecutive months, paid all bills for service, within fifteen days after presentation, the city will refund the deposit.

3. Should the customer establish credit initially by deposit and subsequently by other means in accordance with Section 14.04.060 and then request the return of his or her deposit, the city will return the deposit. (Ord. 4564 § 1, 2009; Ord. 2585 § 1, 1980; prior code § 1.46.050)

14.04.060 Establishment and reestablishment of credit.

A. *Establishment of Credit.* Each applicant for metered service will be required to establish credit, which will be deemed established upon qualifying under any one of the following:

1. Applicant is the owner of the premises upon which service is requested, or of other real estate within the city's service area;

2. Applicant makes a cash deposit to secure payment of his water bills as prescribed in subsection A of Section 14.04.070 under "Amount to Establish Credit;"

3. Applicant furnishes a guarantor satisfactory to the city to secure payment of his or her water bills;

4. Applicant has been a customer of the city within the two-year period immediately preceding the date of the applicant's new application for service and during the last twelve consecutive months of that prior service has paid all water bills without disconnection for nonpayment thereof.

B. *Reestablishment of Credit.*

1. An applicant who previously has been a customer of the city and during the last twelve months of that prior service has had service discontinued for nonpayment of bills will be required to pay any unpaid balance due the city and may be required to reestablish credit by making the deposit prescribed in subsection B of Section 14.04.070 under "Amount to Reestablish Credit."

2. A customer whose service has been discontinued for nonpayment of bills will be required to pay any unpaid balance due the city and may be required to pay a reconnection charge as prescribed in subsection G of Section 14.04.110 under "Restoration—Reconnection Charge" and to reestablish credit by making the deposit prescribed in subsection B of Section 14.04.070 under "Amount to Reestablish Credit" before service is restored. (Prior code § 1.46.060)

14.04.070 Deposits required.

A. *Amount to Establish Credit.* To establish credit by deposit, the amount will not exceed twice the estimated average monthly bills.

B. *Amount to Reestablish Credit.*

1. *Former Customers.* For an applicant who is a former customer and whose service was discontinued during the last twelve months of his former service for nonpayment of bills, an amount equal to twice the estimated average monthly bill for the service desired;

2. *Present Customers.* For a customer whose service has been discontinued for nonpayment of bills, an amount equal to twice his or her average monthly bill for that service.

C. *Applicability to Unpaid Accounts.* Deposits prescribed in this section are applicable to unpaid bills for water service when such service has been discontinued.

D. *Return of Deposits.*

1. Upon discontinuance of service, the city will refund the customer's deposit or the balance thereof in excess of unpaid bills for that service.

2. After the customer has, during the period of time the deposit is held or for twelve consecutive months, paid all bills for service, within fifteen days after presentation, the city will refund the deposit.

3. Should the customer establish credit initially by deposit and subsequently by other means in accordance with Section 14.04.060 and then request the return of his or her deposit, the city will return the deposit. (Prior code § 1.46.070)

14.04.080 Notices.

A. *Notices to Customers.* Notices from the city to a customer normally will be given in writing, either delivered to him or her, mailed to his last-known address, or by leaving such notice in a conspicuous place at the customer's premises. Where conditions warrant and in emergencies, the city may resort to verbal notices given by telephone or in person.

B. *Notices from Customers.* Notices from a customer to the city may be given by him or her or his or her authorized representative verbally or in writing at the city's operating office or to an employee of the city or its agent duly authorized to receive notices or complaints, or may be sent by mail to the city's operating office. (Prior code § 1.46.080)

14.04.090 Rendering and payment of bills.

A. *Rendering of Bills.*

1. *Billing Period.* Bills for water service will be rendered monthly unless otherwise provided in the rate schedules.

2. *Metered Service.* Meters will be read at regular intervals for the preparation of regular bills and as required for the preparation of opening bills, closing bills, and special bills. Each meter on a customer's premises will be considered separately, and the readings of two or more meters will not be combined except where combination of meter reading is specifically provided for in a rate schedule, or where the city's operating convenience or necessity may require the use of more than one meter, or a battery of meters. In this case, the monthly minimum charge will be computed upon the resultant diameter of the total combined discharge areas of such meters.

B. *Payment of Bills.*

1. Regular monthly bills are due and payable on presentation, and payment may be made at the city's office or to an authorized collector.

2. Closing bills, where service is to be discontinued, will be due and payable on presentation, and collection will be made at the time of presentation. (Prior code § 1.46.090)

14.04.100 Disputed bills.

A. *Correctness of Bill.* Should the amount of any bill for service be questioned, an explanation should be promptly requested from the city.

B. *Notice of Deposit to Avoid Discontinuance.* If an explanation satisfactory to the customer is not made by the city and the bill is not paid within fifteen days after its presentation, the city will notify the customer in writing substantially as follows:

1. To avoid discontinuance of service, in lieu of paying the bill in question, the customer may deposit with the city of Bakersfield, 1600 Truxtun Avenue, Bakersfield, California 93301, the amount of the bill claimed by the city to be due.

2. The remittance for this purpose should be made payable to the city and should be accompanied with the bill in question and a statement setting forth the basis for the dispute of the amount of the bill.

C. *Failure to Make Deposit.* Failure of the customer to deposit the amount of any bill in question within fifteen days after the date upon which the notice mentioned in subsection B of this section is given by the city will warrant discontinuance of service without further notice. (Ord. 4564 § 2, 2009; prior code § 1.46.100)

14.04.110 Conditions for discontinuance—Restoration of service—Fees.

A. *Nonpayment of Bills.*

1. A customer's water service may be discontinued for nonpayment of a bill for water service furnished if the bill is not paid within fifteen days after presentation. A customer's service, however, will not be discontinued until the amount of the deposit made to establish credit for that service has been fully absorbed.

2. A customer's water service may be discontinued for nonpayment of bill for water service furnished at a previous or different location served by the city if the bill is not paid within thirty days after presentation at the new location. Residential service will not, however, be discontinued for nonpayment of bills for separate nonresidential service.

3. No service will be discontinued under this section until after at least five days' written notice to the customer of the city's intention.

B. *Unsafe Apparatus.* The city may discontinue service, without notice, to any premises where apparatus, appliances or equipment using water is, in the opinion of the city or Department of Public Health, found to be dangerous or unsafe. The city shall notify the customer promptly of the reasons for the discontinuance and the corrective action to be taken by the customer before service can be restored.

C. *Service Detrimental to Other Customers.* The city may discontinue service without notice to any premises where the use of water thereon by apparatus, appliances, equipment or otherwise is found by the city to be detrimental or injurious to the water service furnished to other customers. Notification to the customer shall be made as provided in subsection B of this section.

D. *Fraud and Abuse.* The city may discontinue water service without notice to any customer when it is discovered the customer has obtained water service by fraudulent means, or has diverted the water service for unauthorized use. The city shall not restore service until the customer has complied with all filed rules and requirements of the city and the city has been reimbursed for the full amount of the service rendered and the actual cost to the city incurred by reason of such fraudulent use.

E. *Noncompliance.* The city may, unless otherwise provided, discontinue water service to a customer for noncompliance with any of the sections of this chapter if the customer fails to comply therewith, within five days after receiving written notice of intention to discontinue service.

F. *Customer's Request for Service Discontinuance.* A customer may have his or her water service discontinued by giving notice to the city or one of its authorized agents of his or her desire, not less than two days before its effective date. He or she will be required to pay all water charges until the effective date stated in such notice. Where such notice is not given, the customer will be required to pay for water service until two days after the city has knowledge that the customer has vacated the premises or otherwise has discontinued water service.

G. *Restoration-Reconnection Charge.* When water service has been discontinued for noncompliance with a section of this code, a restoration-reconnection fee will be assessed as set by the city council. (Ord. 3939 § 5, 1999; Ord. 3783 § 4, 1997; Ord. 3604 § 1, 1994; prior code § 1.46.110)

14.04.120 Rates and fees.

A. *Monthly Rates and Fees.* The city water board, with concurrence of the city council, shall establish monthly rates and fees for water usage. The monthly fee consists of two components: the "readiness to serve fee" which is a flat rate for all customers based on the size of connection and a "quantity unit rates" based on the quantity of water used. A complete schedule of all rates and fees authorized to be charged for water service shall be kept in the city's local offices where they will be available for public inspection.

B. *Availability Fees.* The city water board, with concurrence of the city council, shall establish availability fees for water service facilities required to enable development of all areas served by the city water system except those described in Exhibit C-1 of the City Agreement No. 76-36. Such fees are declared to be necessary to compensate the city for the expense incurred in furnishing source, storage, and water distribution facilities, and related capital project expenses, including, but not limited to, costs of acquisition and financing and necessary costs of operation, maintenance, replacement, improvement and extension of the water system.

Each fiscal year, the water department shall submit to the water board a proposed availability fee schedule. The availability fee shall be adjusted annually by the Construction Cost Index defined in Bakersfield Municipal Code Section 15.84.030. Also, the fee schedule shall be further adjusted to reflect all city expenses incurred as set forth in the previous paragraph. The fee shall be adopted by resolution of the city council following a noticed public hearing.

C. All applicants for service where availability fees are to be paid shall sign a domestic water service contract. The required fee must be paid at the first occurrence of either the issuance of a building permit or the recordation of a final map. No final map allowing construction shall be recorded nor any building permit issued prior to payment of proper fees for water service. (Ord. 4732 § 1, 2013; Ord. 4344 § 1, 2006; Ord. 3504 § 3, 1992; Ord. 2660 § 3, 1981; prior code § 1.46.120)

14.04.130 Temporary service.

"Temporary service" is defined to refer to service for use considered by the city to be nonpermanent or of limited duration, or to be a use by a venture or enterprise of speculative character or of questionable permanency.

A. *Establishment of Temporary Service.* The city will, if in its opinion no undue hardship to its existing customers will result therefrom, furnish temporary service under the following conditions:

1. The applicant will be required to pay to the city, in advance, the estimated net cost of installing and removing the facilities necessary to furnish the service.

2. Where the duration of service is to be less than one month, the applicant may also be required to deposit a sum of money equal to the estimated bill, subject to adjustment and refund or repayment in accordance with the actual bill due upon discontinuance of service.

3. Where the duration of service is to exceed one month, the applicant may also be required to establish his or her credit in the manner prescribed for permanent service.

B. *Change to Permanent Status.* In the event a temporary service becomes permanent, the city will refund to the temporary customer the amount paid for service installation. If the customer continues for thirty-six months, where a main extension is involved, and his or her operations at the end of that time appear

permanent, the payment made under subdivision 1 of subsection A of this section will be adjusted to the terms of the extension rule applicable to permanent service. (Prior code § 1.46.130)

14.04.140 Main extensions—General provisions—Applicability.

A. All extensions of distribution mains, from the city's basic production and transmission system or existing distribution system, to serve new customers, except for those specifically excluded in subsections B or C of this section, shall be made under the provisions of this section through Section 14.04.230 unless specific authority is first obtained from the city to deviate therefrom. A main extension contract shall be executed by the city and the applicant or applicants for the main extension before the city commences construction work on the extensions or, if constructed by the applicant or applicants, before the facilities comprising the main extension are transferred to the city.

B. Extension solely for fire hydrant, private fire protection, resale, temporary, standby, or supplemental service shall not be made under this section through Section 14.04.230.

C. The city may, but will not be required to, make extensions under this section through Section 14.04.230, in easements or rights-of-way where final grades have not been established, or where street grades have not been brought to those established by public authority. If extensions are made when grades have not been established and there is a reasonable probability that the existing grade will be changed, the city shall require that the applicant or applicants for the main extension deposit, at the time of execution of the main extension agreement, the estimated net cost of relocating, raising or lowering facilities upon establishment of final grades. Adjustment of any difference between the amount so deposited and the actual cost of relocating, raising or lowering facilities shall be made within ten days after the city has ascertained such actual cost. The net deposit representing actual cost is not subject to refund. The entire deposit related to the proposed relocation, raising or lowering shall be refunded when such displacements are determined by proper authority not to be required. (Prior code § 1.46.140(a)(1))

14.04.150 Main extensions—General provisions—Definitions.

For the purposes of Sections 14.04.140 through 14.04.230, the following words shall have the meanings as set forth in this section:

A. "Bona fide customer" is a customer (excluding any customer formerly served at the same location) who has given satisfactory evidence that service will be reasonably permanent to the property which has been improved with a building of a permanent nature, and to which service has commenced. The provision of service to a real estate developer or builder, during the construction or development period, shall not establish him as a bona fide customer.

B. "Real estate developer" or "builder" includes any individual, association of individuals, partnership, or corporation that divides a parcel of land into two or more portions.

C. "Adjusted construction cost" is reasonable and does not exceed the costs recorded in conformity with generally accepted water utility accounting practices, and as specifically defined in the Uniform System of Accounts for Water Utilities prescribed by the public utilities commission, of installing facilities of adequate capacity for the service requested. If the city, at its option, should install facilities with a larger capacity or resulting in a greater footage of extension than required for the service requested, the "adjusted construction cost" shall be determined by the application of an adjustment factor to actual construction cost of facilities installed. This factor shall be the ratio of estimated cost of required facilities to estimated cost of actual facilities installed. (Prior code § 1.46.140(a)(2))

14.04.160 Main extensions—General provisions—Ownership, design and construction of facilities.

A. Any facilities installed under this section shall be the sole property of the city.

B. The size, type, quality of materials, and their location shall be specified by the city, and the actual construction shall be done by the city or by a constructing agency acceptable to it.

C. Where the property of an applicant is located adjacent to a right-of-way, exceeding seventy feet in width, for a street, highway, or other public purpose, regardless of the width of the traveled way or pavement, or a freeway, waterway, or railroad right-of-way, the city may elect to install a main extension on the same side thereof as the property of the applicant, and the estimated and adjusted construction costs in such case shall be based upon such an extension.

D. When an extension must comply with an ordinance, regulation, or specification of a public authority, the estimated and adjusted construction costs of the extension shall be based upon the facilities required to comply therewith. (Prior code § 1.46.140(a)(3))

14.04.170 Main extensions—General provisions—Estimates, plans, and specifications.

A. Upon request by a potential applicant for a main extension, the city shall prepare a preliminary sketch and rough estimates of the cost of installation to be advanced by the applicant.

B. Any applicant for a main extension requesting the city to prepare detailed plans, specifications and cost estimates shall be required to deposit with the city an amount equal to the estimated cost of preparation of such

material. The city shall, upon request, make available within forty-five days after receipt of the deposit referred to above in this subsection, such plans, specifications and cost estimates of the proposed main extension. If the extension is to include oversizing of facilities to be done at the city's expense, appropriate details shall be set forth in the plans, specifications and cost estimates.

C. In the event a main extension contract with the city is executed within one hundred eighty days after the city furnished the detailed plans and specifications, the deposit shall become a part of the advance, and shall be refunded in accordance with the terms of the main extension contract. If such contract is not so executed, the deposit to cover the cost of preparing plans, specifications and cost estimates shall be forfeited by the applicant for the main extension and the amount of the forfeited deposit shall be credited to the account or accounts to which the expense of preparing the material was charged.

D. When detailed plans, specifications and cost estimates are requested, the applicant for a main extension shall furnish a map to a suitable scale showing the street and lot layouts and, when requested by the city, contours or other indication of the relative elevation of the various parts of the area to be developed. If changes are made subsequent to the presentation of this map by the applicant, and these changes require additional expense in revising plans, specifications and cost estimates, this additional expense shall be borne by the applicant, not subject to refund, and the additional expense thus recovered shall be credited to the account or accounts to which the additional expense was charged. (Prior code § 1.46.140(a)(4))

14.04.180 Main extensions—General provisions—Timing and adjustment of advances.

A. Unless the applicant for the main extension elects to arrange for the installation of the extension himself, the full amount of the required advance or an acceptable surety bond must be provided to the city at the time of execution of the main extension agreement.

B. If the applicant for a main extension posts a surety bond in lieu of cash, such surety bond must be replaced with cash not less than ten calendar days before construction is to commence; provided, however, that if special facilities are required primarily for the service requested, the applicant for the extension may be required to deposit sufficient cash to cover the cost of such special facilities before they are ordered by the city.

C. An applicant for a main extension who advances funds shall be provided with a statement of actual construction cost and adjusted construction cost showing in reasonable detail the costs incurred for material, labor, any other direct and indirect costs, overheads, and total costs; or unit costs; or contract costs, whichever are appropriate.

D. Such statement shall be submitted within sixty days after the actual construction costs of the installation have been ascertained by the city. In the event that the actual construction costs for the entire installation have not been determined within one hundred twenty days after completion of construction work, a preliminary

determination of actual and adjusted construction costs shall be submitted, based upon the best available information at that time.

E. Any differences between the adjusted construction costs and the amount advanced shall be shown as a revision of the amount of advance and shall be payable within thirty days of the date of submission of the statement. (Prior code § 1.46.140(a)(5))

14.04.190 Main extensions—General provisions—Assignment of main extension contracts.

A. Any contract entered into under Sections 14.04.200 through 14.04.220, or under similar provisions of former rules, may be assigned, after settlement of adjusted construction costs, after written notice to the city by the holder of the contract as shown by the city's records.

B. Such assignment shall apply only to those refunds which become due more than thirty days after the date of receipt by the city of the notice of assignment.

C. The city shall not be required to make any one refund payment under such contract to more than a single assignee. (Prior code § 1.46.140(a)(6))

14.04.200 Main extensions—Serving subdivisions, tracts, housing projects, industrial developments or organized commercial districts—Advances.

A. Unless the procedure outlined in subsection C of this section is followed, an applicant for a main extension to serve a new subdivision, tract, housing project, industrial development or organized commercial district shall be required to advance to the city, before construction is commenced, the estimated reasonable cost of the extension to be actually installed, from the nearest city facility at least equal in size or capacity to the main required to serve both the new customers and a reasonable estimate of the potential customers who might be served directly from the main extension without additional extension. The costs of the extension shall include necessary service stubs or service pipes, fittings, gates and housing therefor, and meter boxes, but shall not include meters. To this shall be added the cost of fire hydrants when requested by the applicant for the main extension or required by public authority, whenever such hydrants are to become the property of the city.

B. If special facilities consisting of items not covered by subsection A of this section are required for the service requested and, when such facilities to be installed will supply both the main extension and other parts of the city's system, at least fifty percent of the design capacity (in gallons, gpm, or other appropriate units) is required to supply the main extension, the cost of such special facilities may be included in the advance,

subject to refund, as provided in Section 14.04.210, along with refunds of the advance of the cost of the extension facilities described in subsection A of this section.

C. In lieu of providing the advances in accordance with subsections A and B of this section, the applicant for a main extension shall be permitted, if qualified in the judgment of the city, to construct and install the facilities himself, or arrange for their installation pursuant to competitive bidding procedures initiated by him and limited to qualified bidders. The cost, including the cost of inspection and supervision by the city, shall be paid directly by the applicant. The applicant shall provide the city with a statement of actual construction cost in reasonable detail. The amount to be treated as an advance subject to refund shall be the lesser of (1) the actual cost or (2) the price quoted in the city's detailed cost estimate. The installation shall be in accordance with the plans and specifications submitted by the city pursuant to subsection B of Section 14.04.180. (Prior code § 1.46.140(b)(1))

14.04.210 Main extensions—Serving subdivisions, tracts, housing projects, industrial developments or organized commercial districts—Refunds.

A. The amount advanced under subsections A, B and C of Section 14.04.200 shall be subject to refund by the city, in cash, without interest, to the party or parties entitled thereto as set forth in subsections B and C of this section. The total amount so refunded shall not exceed the total of the amount advanced. Except as provided in this section, the refunds shall be made in annual, semiannual or quarterly payments, at the election of the city, and for a period not to exceed twenty years after the date of the contract.

B. Whenever costs of main extensions have been advanced pursuant to subsections A or C of Section 14.04.200, the city shall determine the revenue received from customers, including fire protection agencies, supplied by service pipes connected directly to the extension for which the cost was advanced. The refund shall be twenty-two percent of the revenue so received.

C. Whenever costs of special facilities have been advanced pursuant to subsection B or C of Section 14.04.200, the amount so advanced shall be divided by the number of lots to be served by the special facilities. This advance per lot shall be refunded for each lot on which one or more bona fide customers are served by those facilities.

D. With respect to a contract entered into on and after the effective date of this section, if, at any time during the twenty-year refund period specified in subsection A of this section, eighty percent of the bona fide customers for which the extension or special facilities were designed are being served therefrom, the city shall immediately notify the contract holder of that fact, and at that time shall become obligated to pay, in cash, any balance which may remain unrefunded at the end of the twenty-year period. Such balance shall be refunded in five equal annual installments, payable beginning twenty-one years after the date of the contract.

E. Where a contract has been entered into under a former main extension rule, and where eighty percent of the bona fide customers for which the extension or special facilities were designed are being served therefrom,

the city may negotiate and enter into a new and substitute contract, identical in all respects with the original contract, including the original termination date, except that the substitute contract shall include the following provision:

Notwithstanding any other provisions hereof, any unrefunded balance remaining at the termination date of this contract shall be paid in five equal annual installments beginning one year after said termination date. (Prior code § 1.46.140(b)(2))

14.04.220 Main extensions—Serving subdivisions, tracts, housing projects, industrial developments or organized commercial districts—Termination of contracts.

A. Any contract with refunds based upon percentage of revenues and entered into under Sections 14.04.200 through this section, or under similar provisions of former rules, may be purchased by the city and terminated, provided the payment is not in excess of the estimated revenue refund multiplied by the termination factor in the following table, the terms are otherwise mutually agreed to by the parties or their assignees and subsections B and C of Section 14.04.210 are complied with.

B. The estimated revenue refund is the amount that would otherwise be refunded, at the current level of refunds, over the remainder of the twenty-year contract period, or shorter period that would be required to extinguish the total refund obligation.

C. It shall be determined by multiplying twenty-two percent of the average annual revenue per service for the immediately preceding calendar year by the number of bona fide customers at the proposed termination date, times the number of years or fractions thereof to the end of the twenty-year contract period or shorter period that would be required to refund the remaining contract balance.

Termination Factors

Years Remaining	Factor
1	8929
2	8450
3	8006
4	7593
5	7210
6	6852

Years Remaining	Factor
7	6520
8	6210
9	5920
10	5650
11	5398
12	5162
13	4941
14	4734
15	4541
16	4359
17	4188
18	4028
19	3877

(Prior code § 1.46.140(b)(3))

14.04.230 Main extensions—Serving subdivisions, tracts, housing projects, industrial developments or organized commercial districts—Extensions including fire protection.

A. The cost of distribution mains designed to meet the fire flow requirements of the city are to be advanced by the applicant. The city shall refund this advance as provided in Section 14.04.210.

B. Should distribution mains be designed to meet fire flow requirements in excess of those set forth by the city, the increase in cost of the distribution mains necessary to meet such higher fire flow requirements shall be paid to the city as a contribution in aid of construction.

C. The cost, allocated as appropriate, of facilities other than distribution mains required to provide supply, pressure, or storage primarily for fire protection purposes shall be paid to the city as contribution in aid of construction. (Prior code § 1.46.140(c))

14.04.240 Service connections, meters and customers' facilities—Installation.

A. *Service Connections.*

1. Only contractors duly authorized by the city will be permitted to install a service connection from the city's main to the customer's premises.

B. *Meters.*

1. Meters, where authorized, will be installed by the city at the customer's expense, unless otherwise provided in the rules and schedule of rates.

2. Where a meter and other facilities, including housings and connections, are located on a customer's premises, no rent or other charge will be paid by the city therefor.

3. All meters will be sealed by the city at the time of installation, and no seal shall be altered or broken except by one of its authorized employees or agents.

C. *Dual Water Supply—Protective Devices.* Whenever there is present upon any customer's premises a water supply which has not been approved by the Department of Public Health of the state as safe and potable for human use, or the customer is engaged upon the premises in industrial processes using or producing process water or liquid industrial waste or in the handling of sewage or any other dangerous substance, the city may refuse or discontinue service until there has been installed at the expense of the customer upon the customer's premises a suitable protective device approved by the Department of Public Health to protect against backflow of water from the customer's premises into the city's system. Such protective device shall be installed in a manner approved by the city and in a location in which it is readily available to the city for periodic inspection. It shall be the customer's responsibility at his or her own expense to main such protective device in a reliable and safe operating condition at all times.

D. *Pumps and Boosters.* When a customer receiving service at the city's main or service connection must by means of a pump of any kind elevate or increase the pressure of the water received, the pump shall not be attached to any pipe directly connected to the city's main or service pipe. A customer, whose operation requires the use of a quick-opening or quick-closing valve must operate such device from a tank, cistern, sump or other facility which may be served by but not directly connected with the city's distribution mains or service pipes.

E. *Automatic Valves.* Quick-closing or quick-opening valves shall not be installed on customer's pipes which are directly attached to the city's mains or service pipes. A customer whose operation requires the use of a quick-opening or quick-closing valve must operate such device from a tank, cistern, sump or other facility which may be served by but not directly connected with the city's distribution mains or service pipes.

F. *Corrective Measures.* The city, under Sections 14.04.170 and 14.04.180 where a customer prior to the adoption of this section has installed and is operating the prohibited devices, may install on its own mains or service pipes, adequate regulating or flow control valves or other devices designed to prevent the customer's

facilities from interfering with normal pressures maintained in the city's mains and as a safeguard against contamination of the city's water supply. (Ord. 4750 § 3, 2013; Ord. 4632 § 1, 2010; Ord. 2660 § 4, 1981; prior code § 1.46.150(a))

14.04.250 Service connections, meters and customers' facilities—Ownership.

The service connections, meters, and other facilities furnished by the city at the customer's expense and located wholly or partially upon a customer's premises are and shall remain the property of the city, which has the right to repair, replace and remove upon discontinuance of service. (Ord. 2660 § 5, 1981; prior code § 1.46.150(b))

14.04.260 Service connections, meters and customers' facilities—Installation and maintenance responsibility.

The city will not be responsible for the installation and maintenance of the water pipelines beyond the end of the city's service connection or meter. (Prior code § 1.46.150(c))

14.04.270 Service connections, meters and customers' facilities—Right of access to customers' premises.

A. The city or its duly authorized agents shall at all reasonable times have the right of ingress to and egress from the customer's premises for any purpose properly connected with the service of water to the customer.

B. Any inspection work or recommendations made by the city or its agents in connection with plumbing or appliances or any use of water on the customer's premises, either as a result of a complaint or otherwise, will be made without charge and without assumption of any liability in connection therewith. (Prior code § 1.46.150(d))

14.04.280 Service connections, meters and customers' facilities—Compensation to city's employees.

All inspectors, agents and employees of the city are strictly forbidden to demand or accept any personal compensation from a customer for services rendered. (Prior code § 1.46.150(e))

14.04.290 Service connections, meters and customers' facilities—Responsibility for loss or damage.

A. The city will not be responsible for any loss or damage caused by any negligence or wrongful act of a customer or his authorized representatives in installing, maintaining, operating or using any or all appliances, facilities or equipment for which water service is supplied.

B. The customer will be held responsible for damage to the city's meters and other property resulting from the use or operating of appliances and facilities on the customer's premises, including damage caused by steam, hot water, chemicals, etc., or from an act of the customer. (Prior code § 1.46.150(f))

14.04.300 Service connections, meters and customers' facilities—Water wastage.

Where negligent or wasteful use of water exists on a customer's premises, seriously affecting the general service, the city may discontinue the service if such conditions are not corrected within five days after giving customer written notice of intent to do so. (Prior code § 1.46.150(g))

14.04.310 Service connections, meters and customers' facilities—Customers' responsibilities precedent to receiving service.

The customer, as a condition precedent to receiving service shall:

A. Furnish, install, and maintain in good repair necessary piping and facilities to make the connection from the city's service connection to the place of consumption;

B. Provide a main valve between the city's service connection and the point of use;

C. Consult the city prior to installation and secure its approval of the location on the curbline or property line at which connection to the city's service connection shall be made. (Prior code § 1.46.150(h))

14.04.320 Service connections, meters and customers' facilities—Ground wire attachments.

All persons, firms, or corporations are forbidden to attach any ground wire to any plumbing which is or may be connected to any service connection or main belonging to the city, and the city will hold the customer liable

for any damage to its property occasioned by any such ground wire which is now or may hereafter be attached. (Prior code § 1.46.150(i))

14.04.330 Meter tests and adjustment of bills.

A. *Tests.*

1. *Prior to Installation.* Every meter will be tested prior to being installed and no meter will be placed in service if found to register more than two percent fast or slow.

2. *On Customer Request.* A customer may request a meter test upon payment of the cost to the city of the test.

B. *Adjustment of Bills for Meter Error.*

1. *Fast Meters.* When, upon test, the average meter error is found to be more than two percent fast, the city will refund to the customer the amount of the overcharge based on corrected meter readings for the period the meter was in use but not exceeding three months.

2. *Slow Meters.*

a. When, upon test, a meter used for commercial (residential and business) service is found to be registering more than twenty-five percent slow, the city may bill the customer for the amount of the undercharge based upon corrected meter readings for the period the meter was in service but not exceeding three months.

b. When, upon test, a meter used for other than commercial service is found to be registering more than five percent slow, the city may bill the customer for the amount of the undercharge based upon corrected meter readings for the period the meter was in service but not exceeding three months.

3. *Nonregistering Meters.* The city may bill the customer for water consumed while the meter was nonregistering but for a period not exceeding three months at the minimum monthly meter rate, or upon an estimate of the consumption based upon the customer's prior use during the same season of the year if conditions were unchanged, or upon an estimate based upon a reasonable comparison with the use of other customers during the same period, receiving the same class of service under similar circumstances and conditions.

4. *General.* When it is found that the error in a meter is due to some cause, the date of which can be fixed, the overcharge or the undercharge will be computed back to but not beyond such date. (Prior code § 1.46.160)

14.04.340 Service to separate premises and multiple units—Resale of water.

A. *Number of Services to Separate Premises.* Separate premises under single control or management will be supplied through separate individual service pipes unless the city elects otherwise.

B. *Service to Multiple Units on Same Premises.* Separate houses, buildings, living or business quarters on the same premises or on adjoining premises, under a single control or management, may be served by either of the following methods:

1. Through separate service pipes to each unit; provided, that the piping system from each service is independent of the others and is not interconnected;

2. Through a single service pipe to supply the entire premises, in which case only one minimum or readiness-to-serve charge will be applied. The responsibility for payment of charges for all service furnished to combined units through a single service pipe, in accordance with this chapter, must be assumed by the applicant.

C. *Resale of Water.* Except by special agreement with the city, no customer shall resell any of the water received from the city nor shall such water be delivered to premises other than those specified in such customer's application for service. (Prior code § 1.46.170)

The Bakersfield Municipal Code is current through Ordinance 5041, passed November 4, 2020.

Disclaimer: The city clerk has the official version of the Bakersfield Municipal Code. Users should contact the city clerk for ordinances passed subsequent to the ordinance cited above.

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City Website: www.bakersfieldcity.us
City Telephone: (661) 326-3000
Code Publishing Company

Appendix F:

Water Shortage Contingency Plan

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City of Bakersfield
Water Shortage Contingency Plan
December 2021

Introduction

This Water Shortage Contingency Plan (WSCP) for the City of Bakersfield (City) has been prepared in accordance with current Water Code requirements and outlines a program for responding to water supply limitations. The intent of the water conservation measures and progressive restrictions on water use identified in this WSCP is to provide guidance to the City in managing and mitigating anticipated water supply shortages. The structured steps are designed to allow the City to assess its available water supplies and implement appropriate measures in response to actual conditions so that water shortages can be managed efficiently, predictably, and with accountability.

This WSCP includes the following elements as required by the Water Code:

1. Water Supply Reliability Analysis
2. Annual Water Supply and Demand Assessment Procedures
3. Six Standard Water Shortage Levels
4. Shortage Response Actions
5. Communication Protocols
6. Compliance and Enforcement (Domestic Water System service area only)
7. Legal Authorities
8. Financial Consequences of WSCP
9. Monitoring and Reporting (Domestic Water System service area only)
10. WSCP Refinement Procedures (Domestic Water System service area only)
11. Special Water Feature Distinction (Domestic Water System service area only)
12. Plan Adoption, Submittal and Availability

All of the above elements apply to the Domestic Water System service area. The elements shown as "Domestic Water System service area only" are not applicable to the Wholesale Water System service area.

A water shortage condition is defined as when available water supplies are insufficient to meet the normally expected customer demands. Water shortage conditions may be a result of population growth, climate change, drought, catastrophic events, or other water shortage emergencies declared by either the City, State or Federal government.

The six standard water shortage levels and response actions defined in this WSCP increase restrictions on water use in response to the increasing levels of water shortage conditions. Other than response actions specified as applicable to the Wholesale Water System service area, the implementation of response actions within this WSCP apply directly to the Domestic Water System service area. The retail agencies within the City's Wholesale Water System service area are responsible for the implementation and enforcement of restrictions and prohibitions at the retail level within their respective service areas.

Each of the required elements is addressed in the following sections.

1. Water Supply Reliability Analysis

The City's 2020 Urban Water Management Plan (2020 UWMP) update includes a water supply reliability analysis and drought risk assessment which are summarized herein. The City's Wholesale Water System replenishes its Kern River supplies to the groundwater basin for the benefit of retail water suppliers providing service to City areas through their respective groundwater wells. The KRGSA GSP includes implementation of projects and management actions including the City's conjunctive use optimization project and proposed expansion of its recycled water use which are anticipated to provide additional water supplies for the benefit of the groundwater basin. The Domestic Water System and other retail water suppliers within the Wholesale Water System service area are able to increase use of their groundwater wells during years of reduced Kern River supplies.

The Domestic Water System service area relies significantly on groundwater pumping to meet its demands. With implementation of the projects and management actions identified in the KRGSA GSP, the City's groundwater supplies are anticipated to be sustainable and available to meet the projected demands of its Domestic Water System service area. The KRGSA GSP identifies sustainable management criteria for water levels based on the historic low water levels experienced in 2015-2016. Maintaining water levels above the Minimum Threshold levels identified in the KRGSA GSP is anticipated to allow the City's wells to meet the demands of the Domestic Water System while minimizing undesirable results such as declining pump capacity, well inefficiency, water levels falling below pump intakes and pump screens, and degraded water quality.

As population and water demands increase with the Domestic Water System service area, the City will construct new wells required to meet the increased demands. Groundwater wells will be equipped with wellhead treatment as necessary to remove contaminants such as arsenic and 1,2,3-Trichloropropane that exceed water quality standards. When SWP supplies are not available from KCWA ID4, the City is able to deliver its Kern River water to KCWA ID4 for treatment in place of SWP supplies.

The Drought Risk Assessment in the 2020 UWMP update evaluates the reliability of the Domestic Water System's water supplies to meet drought conditions for 2021 and a subsequent five period. The Drought Risk Assessment indicates that although the Domestic Water System's water supplies are anticipated to be adequate to meet drought conditions during this period, it is assumed that water supplies and water demands are reduced by 10 percent in the second dry year and by 15 percent in the third through fifth dry years as a result of water conservation measures expected to be implemented during an extended drought period. The reduction in demands will be accomplished by implementation of the appropriate Shortage Level and associated response actions in this WSCP.

A catastrophic event may result in a significant loss of City water supplies for a temporary period lasting from a day to a week or more. Examples of catastrophic events include earthquake, widespread power outage or other disaster. The WSCP shortage levels and response actions are intended to be implemented as appropriate to any future water shortage condition.

2. Annual Water Supply and Demand Assessment Procedures

The City Water Resources Manager will conduct an annual assessment of the City's water supplies and demands and prepare an Annual Water Shortage Assessment Report (Annual Assessment Report) for both the Domestic Water System and Wholesale Water System considering the following:

- Current year unconstrained demand (considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable),

- Current year available supply (considering hydrological and regulatory conditions in the current year and one dry year),
- Existing infrastructure capabilities and plausible constraints,
- A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment, and
- A description and quantification of each source of water supply.

The Annual Assessment Reports will be completed and submitted to DWR prior to July 1 of each year (beginning in 2022) per Water Code requirements.

If water shortage conditions requiring declaration of a Water Shortage Level 2 or higher are anticipated, the Annual Assessment Reports shall be submitted to the City Council for approval. The Annual Assessment Report for Water Shortage Level 2 or higher water shortage conditions will set for the criteria for determining when the particular Water Shortage Level is to be implemented and terminated as well as the appropriate shortage response actions, compliance and enforcement actions, and communications protocols consistent with the WSCP.

3. Six Standard Water Shortage Levels

As the water purveyor, the City must provide the minimum health and safety water needs of the Domestic Water System service area at all times. Implementation of this WSCP prioritizes water use as follows:

1. Health and safety – interior residential water use and fire suppression.
2. Commercial, Industrial, and Governmental – jobs and economic base.
3. Landscaping – residential, business/commercial, parks.
4. New Demand – all projects.

The six standard water shortage levels are defined by the State to allow for increasing levels of water conservation measures in response increasing severity of water shortage.

The applicable water shortage Level and response actions will depend on the causes, severity, and anticipated duration of the water supply shortage. The Six Standard Water Shortage Levels for both the Domestic Water System and the Wholesale Water System are summarized in **Table 1**.

Table 1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Narrative Description**
1	Up to 10%	Variations in precipitation and mild droughts that may only last a year or two.
2	Up to 20%	Prolonged water shortages of moderate severity such as those caused by a multi-year drought.
3	Up to 30%	Most severe multi-year droughts, major failures in water production and distribution facilities.
4	Up to 40%	An exceptional crisis that could be caused only by the most severe multi-year drought, natural disaster, or catastrophic failure of major water supply infrastructure. Impacts to public health and safety would be significant.
5	Up to 50%	
6	>50%	
NOTES:		

4. Shortage Response Actions

The City has established the following shortage response actions within the Domestic Water System service area for the six standard water shortage levels defined above. The City will expand its public information campaign to encourage water conservation to achieve the appropriate decrease in demand for each shortage level. Water meter data will be monitored to determine the effectiveness of the shortage response actions in achieving the desired water demand reduction.

The Demand Reduction Actions to be implemented at each Shortage Level and the associated reduction in the shortage gap anticipated to be achieved due to implementation are summarized in **Table 2**.

Table 2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
All Shortage Levels	Expand Public Information Campaign	Depends on Shortage Level. See Notes.	Implemented at all stages as appropriate to meet demand reduction targets	No
All Shortage Levels	Offer Water Use Surveys	Depends on Shortage Level. See Notes.	Implemented at all stages	No
All Shortage Levels	Provide Rebates on Plumbing Fixtures and Devices	Depends on Shortage Level. See Notes.	Implemented at all stages	No

Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
All Shortage Levels	Provide Rebates for Landscape Irrigation Efficiency	Depends on Shortage Level. See Notes.	Implemented at all stages	No
All Shortage Levels	Landscape - Restrict or prohibit runoff from landscape irrigation	Depends on Shortage Level. See Notes.	Implemented at all stages	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	Landscape - Limit landscape irrigation to specific times	Depends on Shortage Level. See Notes.	Advise irrigation to be done after 6 pm and before 9 am for optimal efficiency	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	CII - Other CII restriction or prohibition	Depends on Shortage Level. See Notes.	Implement water efficiency measures to reduce potable water usage consistent with reduction targets	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	Landscape - Other landscape restriction or prohibition	Depends on Shortage Level. See Notes.	All irrigation and landscape projects shall adhere to the State's Model Water Efficient Landscape Ordinance	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Depends on Shortage Level. See Notes.	Implemented at all stages	No for Level 1, Yes for Levels 2 and Higher
All Shortage Levels	Other - Require automatic shut off of hoses	Depends on Shortage Level. See Notes.	Require shut-off nozzles on hoses for vehicle washing with potable water	No for Level 1, Yes for Levels 2 and Higher
1	Decrease Line Flushing	Up to 10% (See Note 1)	Implemented as appropriate to meet demand reduction targets	No
1	Landscape - Limit landscape irrigation to specific times	Up to 10% (See Note 1)	Every other day, three days per week	No for Level 1, Yes for Levels 2 and Higher
2	Other - Prohibit use of potable water for washing hard surfaces	Up to 20% (See Note 2)		Yes
2	CII - Other CII restriction or prohibition	Up to 20% (See Note 2)	Must reduce water usage consistent with reduction targets	Yes
3	Increase Water Waste Patrols	Up to 30% (See Note 3)		No

Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
3	Reduce System Water Loss	Up to 30% (See Note 3)		No
3	Water Features - Restrict water use for decorative water features, such as fountains	Up to 30% (See Note 3)	Prohibit water use for decorative water features that do not recirculate water	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Up to 30% (See Note 3)		Yes
3	Other - Prohibit use of potable water for construction and dust control	Up to 30% (See Note 3)		No
3	Other	Up to 30% (See Note 3)	Implement mandatory customer reductions	Yes
3	Other	Up to 30% (See Note 3)	Implement drought ordinance	Yes
4	Increase Frequency of Meter Reading	Up to 40% (See Note 4)	Monitor water use for compliance reduction targets	No
4	Landscape - Prohibit all landscape irrigation	Up to 40% (See Note 4)	Prohibit all landscape irrigation with potable water	Yes
4	Other water feature or swimming pool restriction	Up to 40% (See Note 4)	Prohibit use of water for recreational purposes such as water parks and filling of pools	No
4	Other	Up to 40% (See Note 4)	Promote/expand use of recycled water	No
5	Pools and Spas - Require covers for pools and spas	Up to 50% (See Note 5)		No
5	Moratorium or Net Zero Demand Increase on New Connections	Up to 50% (See Note 5)	Require net zero demand increase on new water service connections	No
6	Landscape - Prohibit all landscape irrigation	Greater than 50% (See Note 6)		Yes

Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
6	Moratorium or Net Zero Demand Increase on New Connections	Greater than 50% (See Note 6)	Moratorium on new water service connections	No

NOTES:

1. Target demand reduction for all measures for Shortage Level 1 is up to 10%.
2. Target demand reduction for all measures for Shortage Level 2 is up to 20%.
3. Target demand reduction for all measures for Shortage Level 3 is up to 30%.
4. Target demand reduction for all measures for Shortage Level 4 is up to 40%.
5. Target demand reduction for all measures for Shortage Level 5 is up to 50%.
6. Target demand reduction for all measures through Shortage Level 6 is greater than 50% up to the anticipated shortage gap.

The City Council shall have the authority to take any other action available to further reduce demands within the Domestic Water System service area to meet available supplies.

The Wholesale Water System will communicate with its retail water system customers regarding the anticipated shortage level and corresponding reductions in available water supplies. The Wholesale Water System will participate in public awareness campaigns and may implement measures to increase available supplies such as short-term water purchases or exchanges depending on the anticipated shortage gap.

Catastrophic Events:

Catastrophic events shall be evaluated as to their impact on the respective City Water System's ability to deliver water supplies so that the appropriate water shortage level can be identified. The City Water Resources Manager may immediately implement the appropriate shortage response actions due to a catastrophic event.

A seismic risk analysis was completed as a part of the Kern County Multi-Jurisdiction Hazard Mitigation Plan. Earthquake hazard was determined to be a high priority issue county wide. An earthquake can impact water delivery systems through damage to canal systems, water mains, and other water system facilities.

In the event of an earthquake or other catastrophic event, the City will implement its Emergency Response Plan. The City will coordinate with the Kern County Emergency Operations Center in accordance with the Kern County Emergency Operations Plan.

5. Communication Protocols

Table 3 provides the anticipated communication protocols for the various water shortage levels. The degree of communication increases with the water shortage level.

Table 3 – Communication Protocol by Shortage Level	
Shortage Level	**Description**
1	• Public information campaign to encourage water conservation due to water shortage level. • Communication with Wholesale Water System customers regarding anticipated shortage conditions.
2	• Continue with Shortage Level 1 actions as appropriate for Shortage Level 2 conditions. • Newsletter or bill insert to notify customers of declared water shortage level and implementation of mandatory water use restrictions in the Domestic Water System service area.
3 through 6	• Continue with Shortage Level 2 actions as appropriate for the declared Shortage Level condition. • Press release notifying the public of declared water shortage level and implementation of mandatory water use restrictions and enforcement actions in the Domestic Water System service area.
Emergency Conditions	• Coordination with Kern County Emergency Operations Center. • Communication with Wholesale Water System customers regarding anticipated shortage conditions. • Notifications per Emergency Response Plan. • Public information campaign to notify customers and public of declared water shortage emergency and implementation of mandatory water use restrictions in the Domestic Water System service area.

6. Compliance and Enforcement (Domestic Water System Service Area)

As required by Water Code Section 366, excessive water use by metered single-family residential customers and customers in multiunit housing complexes in which each unit is individually metered or submetered is prohibited during water shortage conditions of Level 3 or higher. Customers with excessive water use will be identified through meter data in comparison to the declared water shortage condition and reasonable water use based on factors such as the full-time occupancy of the household, amount of landscaped area, seasonal weather conditions, and the rate of evapotranspiration. The City will establish procedures to monitor compliance with the water use restrictions defined in this WSCP.

Enforcement of the WSCP shall be in accordance with Bakersfield Municipal Code Chapter 14.02 Water Use Regulations which addresses water use restrictions (14.02.010), penalties (14.02.020), administrative citations (14.02.030), administrative fines (14.02.035), administrative citation review process (14.02.040), and administrative hearing officer (14.02.045).

7. Legal Authorities

The City has the legal authority to declare water shortages through adoption of resolutions or ordinances. The City shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1 general provision regarding water shortage emergencies in the California Water Code. The City shall coordinate with Kern County for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

Per Bakersfield Municipal Code Section 14.02.020, failure to comply with water use regulations may be punishable as an infraction, or misdemeanor pursuant to Bakersfield Municipal Code Section 1.40.010, an administrative citation pursuant to Bakersfield Municipal Code Section 14.02.030, or any other available remedies allowed by law.

8. Financial Consequences of WSCP

The City reviews and revises its water rates for its Wholesale Water System and its Domestic Water System on a periodic basis. The projected costs of compliance with declared shortage levels will be considered as contingencies within future rate studies so that adequate reserves will be available to cover the additional expenses and shortfalls in revenue caused by periodic water shortages. The City may also defer planned maintenance or capital improvements until revenues recover. If expenses are found to exceed revenues, the City may implement other measures such as drought rate surcharges or increases in water rates to its customers.

9. Monitoring and Reporting (Domestic Water System Service Area)

The City's Domestic Water System is operated under a service contract with Cal Water. Under normal circumstances, water production is monitored daily. Total water production is reported monthly to the City's Water Resources Department and incorporated into the water supply report.

During a Level 1 through Level 2 water shortage, monthly production figures will be compared to the target monthly production to verify if the water use reduction goal is being met. If reduction goals are not being met, the City Water Resources Manager will be notified so that corrective action can be taken.

During a Level 3 through Level 6 water shortage, the procedure listed above will be followed, with the addition of a weekly production report to the City Water Resources Manager. During emergency shortages, production figures will be reported to the City Water Resources Manager daily.

10. WSCP Refinement Procedures (Domestic Water System Service Area)

The response actions and other considerations in this WSCP shall be reviewed on a periodic basis to determine the effectiveness of the implementation of the various measures to achieve the desired water demand reductions. Proposed revisions to the WSCP will be submitted to the City Council for adoption.

11. Special Water Feature Distinction (Domestic Water System Service Area)

Special water features are defined as ponds, lakes, waterfall, fountains, or other water features that may be able to use recycled water or other non-potable supplies. The City may adopt measures that are specific to special water features that do not rely on potable water as a source of supply.

12. Plan Adoption, Submittal, and Availability

This WSCP was adopted by the City as a part of the adoption process for the 2020 UWMP at the Regular Meeting of the City Council on December 15, 2021. A public hearing was held on November 10, 2021.

The intent of the Public Hearing was to gather input from the public that is served by the City's Domestic and Wholesale Water Systems as well as other interested entities. Written and verbal comments received during the public hearing process have been addressed as appropriate in the final WSCP document. A copy of the resolution adopting the WSCP is attached as **Exhibit A**.

The 2020 UWMP update and WSCP will be submitted to the California Department of Water Resources, the California State Library, and Kern County within 30 days of adoption by the City.

Commencing no later than 30 days after adoption, the City will have a copy of the 2020 UWMP update and WSCP available for public review at City Hall and posted on the City's website.

For updates to the WSCP outside of the UMWP update cycle, the City shall make the revised WSCP available as follows:

- To its customers and Kern County no later than 30 days after adoption,
- To Department of Water Resources in accordance with protocols for submission and using electronic reporting tools no later than 30 days after adoption,
- For public review during normal business not later than 30 days after filing a copy of the WSCP with the Department of Water Resources.

Appendix G:

SB X7-7 Compliance and Verification Forms:

- 2020 Compliance Form
- Verification and Compliance Tables from 2015 UWMP

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SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☑	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	161,980
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use

Compliance Year 2020	2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	2020 Deductions					2020 Gross Water Use
		Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use*	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	45,649			-		-	**45,649**

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)

2020 Gross Water *Fm SB X7-7 Table 4*	2020 Population *Fm SB X7-7 Table 3*	2020 GPCD
45,649	161,980	**252**

NOTES:

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD (Enter "0" if Adjustment Not Used)			TOTAL Adjustments[1]	Adjusted 2020 GPCD[1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD[1, 2]	Did Supplier Achieve Targeted Reduction for 2020?
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
252	-	-	-	-	252	253	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

SB X7-7 Verification and Compliance Tables from 2015 UWMP

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	47,346	Acre Feet
	2008 total volume of delivered recycled water	0	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[3]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2006	
	Year ending baseline period range[4]	2010	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

NOTES:

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☐	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☑	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	1995	64,028
Year 2	1996	67,919
Year 3	1997	71,812
Year 4	1998	75,716
Year 5	1999	79,623
Year 6	2000	83,569
Year 7	2001	89,691
Year 8	2002	95,863
Year 9	2003	102,052
Year 10	2004	108,265
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2006	118,051
Year 2	2007	121,614
Year 3	2008	125,188
Year 4	2009	128,774
Year 5	2010	132,434
2015 Compliance Year Population		
2015		146,496
NOTES:		

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	23,271			-		-	23,271
Year 2	1996	24,948			-		-	24,948
Year 3	1997	24,939			-		-	24,939
Year 4	1998	24,361			-		-	24,361
Year 5	1999	30,598			-		-	30,598
Year 6	2000	27,406			-		-	27,406
Year 7	2001	33,629			-		-	33,629
Year 8	2002	33,706			-		-	33,706
Year 9	2003	36,367			-		-	36,367
Year 10	2004	37,287			-		-	37,287
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**29,651**
5 Year Baseline - Gross Water Use								
Year 1	2006	36,713			-		-	36,713
Year 2	2007	42,451			-		-	42,451
Year 3	2008	47,346			-		-	47,346
Year 4	2009	49,586			-		-	49,586
Year 5	2010	43,210			-		-	43,210
5 year baseline average gross water use								**43,861**
2015 Compliance Year - Gross Water Use								
2015		35,221	-		-		-	**35,221**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	Groundwater
This water source is:	
☑	The supplier's own water source
☐	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	23,271		23,271
Year 2	1996	24,948		24,948
Year 3	1997	24,939		24,939
Year 4	1998	24,361		24,361
Year 5	1999	30,598		30,598
Year 6	2000	27,406		27,406
Year 7	2001	33,629		33,629
Year 8	2002	33,706		33,706
Year 9	2003	36,367		36,367
Year 10	2004	37,287		37,287
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2006	36,713		36,713
Year 2	2007	42,451		42,451
Year 3	2008	45,517		45,517
Year 4	2009	45,775		45,775
Year 5	2010	37,976		37,976
2015 Compliance Year - Water into Distribution System				
2015		31,029		31,029

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	Kern River Water			
This water source is:				
☑	The supplier's own water source			
☐	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	0		0
Year 2	1996	0		0
Year 3	1997	0		0
Year 4	1998	0		0
Year 5	1999	0		0
Year 6	2000	0		0
Year 7	2001	0		0
Year 8	2002	0		0
Year 9	2003	0		0
Year 10	2004	0		0
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2006	0		0
Year 2	2007	0		0
Year 3	2008	1829		1,829
Year 4	2009	1845		1,845
Year 5	2010	1788		1,788
2015 Compliance Year - Water into Distribution System				
2015		963		963
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES:				

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	Imported State Water			
This water source is:				
☐	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	0		0
Year 2	1996	0		0
Year 3	1997	0		0
Year 4	1998	0		0
Year 5	1999	0		0
Year 6	2000	0		0
Year 7	2001	0		0
Year 8	2002	0		0
Year 9	2003	0		0
Year 10	2004	0		0
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2006	0		0
Year 2	2007	0		0
Year 3	2008	0		0
Year 4	2009	1966		1,966
Year 5	2010	3446		3,446
2015 Compliance Year - Water into Distribution System				
2015		3,229		3,229
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES:				

SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction *(For use only by agencies that are deducting indirect recycled water)*

Baseline Year *Fm SB X7-7 Table 3*		**Surface Reservoir Augmentation**					**Groundwater Recharge**			**Total Deductible Volume of Indirect Recycled Water Entering the Distribution System**
		Volume Discharged from Reservoir for Distribution System Delivery	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/ Treatment Loss	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility*	Transmission/ Treatment Losses	Recycled Volume Entering Distribution System from Groundwater Recharge	
10-15 Year Baseline - Indirect Recycled Water Use										
Year 1	1995			-		-			-	-
Year 2	1996			-		-			-	-
Year 3	1997			-		-			-	-
Year 4	1998			-		-			-	-
Year 5	1999			-		-			-	-
Year 6	2000			-		-			-	-
Year 7	2001			-		-			-	-
Year 8	2002			-		-			-	-
Year 9	2003			-		-			-	-
Year 10	2004			-		-			-	-
Year 11	0			-		-			-	-
Year 12	0			-		-			-	-
Year 13	0			-		-			-	-
Year 14	0			-		-			-	-
Year 15	0			-		-			-	-
5 Year Baseline - Indirect Recycled Water Use										
Year 1	2006			-		-			-	-
Year 2	2007			-		-			-	-
Year 3	2008			-		-			-	-
Year 4	2009			-		-			-	-
Year 5	2010			-		-			-	-
2015 Compliance - Indirect Recycled Water Use										
2015				-		-			-	-

**Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

NOTES:

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	64,028	23,271	324
Year 2	1996	67,919	24,948	328
Year 3	1997	71,812	24,939	310
Year 4	1998	75,716	24,361	287
Year 5	1999	79,623	30,598	343
Year 6	2000	83,569	27,406	293
Year 7	2001	89,691	33,629	335
Year 8	2002	95,863	33,706	314
Year 9	2003	102,052	36,367	318
Year 10	2004	108,265	37,287	307
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**316**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2006	118,051	36,713	278
Year 2	2007	121,614	42,451	312
Year 3	2008	125,188	47,346	338
Year 4	2009	128,774	49,586	344
Year 5	2010	132,434	43,210	291
5 Year Average Baseline GPCD				**312**
2015 Compliance Year GPCD				
2015		146,496	35,221	**215**
NOTES:				

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	316
5 Year Baseline GPCD	312
2015 Compliance Year GPCD	215
NOTES:	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
316	**253**
NOTES:	

SB X7-7 Table 7-E: Target Method 3				
Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
☐		North Coast	137	130
☐		North Lahontan	173	164
☐		Sacramento River	176	167
☐		San Francisco Bay	131	124
☐		San Joaquin River	174	165
☐		Central Coast	123	117
☐	100%	Tulare Lake	188	179
☐		South Lahontan	170	162
☐		South Coast	149	142
☐		Colorado River	211	200
Target *(If more than one region is selected, this value is calculated.)*				**179**
NOTES:				

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
312	297	253	**253**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

NOTES:

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
253	316	**284**
NOTES:		

SB X7-7 Table 9: 2015 Compliance

Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)* Enter "0" if Adjustment Not Used: Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
215	284	*0*	*0*	*0*	-	215	215	**YES**

NOTES:

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Appendix H:

AWWA Water Audit Reporting Worksheets:

- 2016 through 2020

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AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

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Water Audit Report for: City of Bakersfield (CA1510031)

Reporting Year: 2016 (1/2016 - 12/2016)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

	Grading	Volume		Pcnt:	Value:	
Volume from own sources:	5	30,414.180	acre-ft/yr	0.00%		acre-ft/yr
Water imported:	5	7,404.270	acre-ft/yr	0.00%		acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr			acre-ft/yr

Enter negative % or value for under-registration

Enter positive % or value for over-registration

WATER SUPPLIED: 37,818.450 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: for help using option buttons below

	Grading	Volume		Pcnt:	Value:	
Billed metered:	5	36,544.270	acre-ft/yr			
Billed unmetered:	n/a	0.000	acre-ft/yr			
Unbilled metered:	n/a	0.000	acre-ft/yr			
Unbilled unmetered:	5	94.546	acre-ft/yr	1.25%	94.546	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: 36,638.816 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 1,179.634 acre-ft/yr

Apparent Losses

	Grading	Volume		Pcnt:	Value:	
Unauthorized consumption:		94.546	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	2	745.801	acre-ft/yr	2.00%		acre-ft/yr
Systematic data handling errors:		91.361	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 931.708 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 247.926 acre-ft/yr

WATER LOSSES: 1,179.634 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 1,274.180 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

	Grading		
Length of mains:	8	525.0	miles
Number of active AND inactive service connections:	8	46,397	
Service connection density:		88	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

	Grading		
Average operating pressure:	4	70.0	psi

COST DATA

	Grading			
Total annual cost of operating water system:	10	$27,228,359	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$1.35	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	4	$246.93	$/acre-ft	Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 55 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources

2: Customer metering inaccuracies

3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

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Water Audit Report for: City of Bakersfield (CA1510031)
Reporting Year: 2017 1/2017 - 12/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

			Pcnt:	Value:	
Volume from own sources:	5	30,107.868 acre-ft/yr	0.00%		acre-ft/yr
Water imported:	5	11,638.904 acre-ft/yr	0.00%		acre-ft/yr
Water exported:	n/a	0.000 acre-ft/yr			acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 41,746.772 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	38,884.310 acre-ft/yr			
Billed unmetered:	n/a	0.000 acre-ft/yr			
Unbilled metered:	n/a	0.000 acre-ft/yr			
Unbilled unmetered:	5	104.367 acre-ft/yr	1.25%	104.367	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: 38,988.677 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

2,758.095 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		104.367 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	2	793.557 acre-ft/yr	2.00%		acre-ft/yr
Systematic data handling errors:		97.211 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 995.135 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1,762.960 acre-ft/yr

WATER LOSSES: 2,758.095 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 2,862.462 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	589.0	miles
Number of active AND inactive service connections:	8	46,748	
Service connection density:		79	conn./mile main
Are customer meters typically located at the curbstop or property line?		Yes	
Average length of customer service line:			(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	4	70.0	psi

COST DATA

Total annual cost of operating water system:	10	$35,294,163	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$1.09	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	7	$149.65	$/acre-ft	Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 58 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

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Water Audit Report for: City of Bakersfield (CA1510031)
Reporting Year: 2018 (1/2018 - 12/2018)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

			Pcnt:	Value:	
Volume from own sources:	7	29,757.000	acre-ft/yr	-1.66%	acre-ft/yr
Water imported:	5	9,943.710	acre-ft/yr	0.00%	acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr		acre-ft/yr
WATER SUPPLIED:		**40,201.784**	acre-ft/yr		

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here for help using option buttons

			Pcnt:	Value:	
Billed metered:	5	41,064.990	acre-ft/yr		
Billed unmetered:	n/a	0.000	acre-ft/yr		
Unbilled metered:	n/a	0.000	acre-ft/yr		
Unbilled unmetered:	5	100.504	acre-ft/yr	1.25%	100.504 acre-ft/yr
AUTHORIZED CONSUMPTION:		**41,165.494**	acre-ft/yr		

Use buttons to select percentage of water supplied OR value

Check input values; WATER SUPPLIED should be greater than AUTHORIZED CONSUMPTION

WATER LOSSES (Water Supplied - Authorized Consumption)

-963.711 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		100.504	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	838.061	acre-ft/yr	2.00%	acre-ft/yr
Systematic data handling errors:	5	102.662	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **1,041.228** acre-ft/yr

Check input values; APPARENT LOSSES should be less than WATER LOSSES

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **-2,004.939** acre-ft/yr

WATER LOSSES: **-963.711** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **-863.206** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	594.0	miles
Number of active AND inactive service connections:	9	46,237	
Service connection density:		78	conn./mile main
Are customer meters typically located at the curbstop or property line?		Yes	
Average length of customer service line:			(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	5	70.0	psi

COST DATA

Total annual cost of operating water system:	10	$35,533,073	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$1.09	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	7	$133.16	$/acre-ft	Use Customer Retail Unit Cost to value real

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 65 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

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Water Audit Report for: CITY OF BAKERSFIELD (CA1510031)
Reporting Year: 2019 (1/2019 - 12/2019)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

			Pcnt:	Value:	
Volume from own sources:	5	32,811.720	acre-ft/yr	-1.66%	acre-ft/yr
Water imported:	5	9,041.710	acre-ft/yr	0.00%	acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr		acre-ft/yr
WATER SUPPLIED:		**42,407.299**	acre-ft/yr		

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: for help using option buttons

			Pcnt:	Value:	
Billed metered:	5	40,024.760	acre-ft/yr		
Billed unmetered:	n/a	0.000	acre-ft/yr		
Unbilled metered:	n/a	0.000	acre-ft/yr		
Unbilled unmetered:	5	106.018	acre-ft/yr	1.25%	106.018 acre-ft/yr
AUTHORIZED CONSUMPTION:		**40,130.778**	acre-ft/yr		

Use buttons to select percentage of water supplied OR value

WATER LOSSES (Water Supplied - Authorized Consumption)		**2,276.521**	acre-ft/yr		
Apparent Losses					
Unauthorized consumption:		106.018	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	816.832	acre-ft/yr	2.00%	acre-ft/yr
Systematic data handling errors:	5	100.062	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses:		**1,022.912**	acre-ft/yr
Real Losses (Current Annual Real Losses or CARL)			
Real Losses = Water Losses - Apparent Losses:		**1,253.609**	acre-ft/yr
WATER LOSSES:		**2,276.521**	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER:		**2,382.539**	acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	598.0	miles	
Number of active AND inactive service connections:	9	47,167		
Service connection density:		79	conn./mile main	
Are customer meters typically located at the curbstop or property line?		Yes		
Average length of customer service line:				(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	5	70.0	psi	

COST DATA

Total annual cost of operating water system:	10	$43,655,392	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$1.09	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	7	$143.10	$/acre-ft	Use Customer Retail Unit Cost to value real

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 60 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software: Reporting Worksheet

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American Water Works Association

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Click to add a comment

Water Audit Report for: CITY OF BAKERSFIELD (CA1510031)
Reporting Year: 2020 1/2020 - 12/2020

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

			Pcnt:	Value:	
WATER SUPPLIED					
Volume from own sources:	6	34,106.740 acre-ft/yr	8 0.00%		acre-ft/yr
Water imported:	3	11,541.960 acre-ft/yr	4 0.00%		acre-ft/yr
Water exported:		0.000 acre-ft/yr			acre-ft/yr
WATER SUPPLIED:		**45,648.700** acre-ft/yr	Enter negative % or value for under-registration Enter positive % or value for over-registration		
AUTHORIZED CONSUMPTION					
Billed metered:	8	42,514.010 acre-ft/yr	Click for help using option buttons		
Billed unmetered:		0.000 acre-ft/yr			
Unbilled metered:		0.000 acre-ft/yr	Pcnt:	Value:	
Unbilled unmetered:	5	106.285 acre-ft/yr	1.25%	106.285	acre-ft/yr
AUTHORIZED CONSUMPTION:		**42,620.295** acre-ft/yr	Use buttons to select percentage of water supplied OR value		
WATER LOSSES (Water Supplied - Authorized Consumption)		**3,028.405** acre-ft/yr			
Apparent Losses			Pcnt:	Value:	
Unauthorized consumption:	3	106.285 acre-ft/yr	0.25%	106.285	acre-ft/yr
Customer metering inaccuracies:	2	867.633 acre-ft/yr	2.00%		acre-ft/yr
Systematic data handling errors:	3	106.285 acre-ft/yr	0.25%	106.285	acre-ft/yr
Apparent Losses:		**1,080.203** acre-ft/yr			
Real Losses (Current Annual Real Losses or CARL)					
Real Losses = Water Losses - Apparent Losses:		**1,948.202** acre-ft/yr			
WATER LOSSES:		**3,028.405** acre-ft/yr			
NON-REVENUE WATER					
NON-REVENUE WATER:		**3,134.690** acre-ft/yr			
= Water Losses + Unbilled Metered + Unbilled Unmetered					
SYSTEM DATA					
Length of mains:	10	613.0 miles			
Number of active AND inactive service connections:	8	48,140			
Service connection density:		79 conn./mile main			
Are customer meters typically located at the curbstop or property line?		Yes			
Average length of customer service line:			(length of service line, beyond the property boundary, that is the responsibility of the utility)		
Average length of customer service line has been set to zero and a data grading score of 10 has been applied					
Average operating pressure:	7	70.0 psi			
COST DATA					
Total annual cost of operating water system:	10	$33,878,737 $/Year			
Customer retail unit cost (applied to Apparent Losses):	10	$1.09 $/100 cubic feet (ccf)			
Variable production cost (applied to Real Losses):	9	$148.25 $/acre-ft	Use Customer Retail Unit Cost to value real		

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 64 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Water imported

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Appendix I:

Multi-Jurisdiction Hazard Mitigation Plan:

- City of Bakersfield

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KERN COUNTY

MULTI-JURISDICTION HAZARD MITIGATION PLAN

PARTICIPATING JURISDICTION ANNEX

MUNICIPALITY

CITY OF BAKERSFIELD

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Kern County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF BAKERSFIELD (BK.)

Municipal Participating Jurisdiction Annex

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Adoption Record

To comply with DMA 2000, the County Board of Supervisors and participating jurisdictions have officially adopted this Kern County Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and Volume 2. The adoption of the MJHMP in its entirety recognizes the jurisdictions' commitment to reducing the impacts of natural hazards within the County and Cities. See below record of adoption.

Section 1. City of Bakersfield

1.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Bakersfield. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the City of Bakersfield. This Annex provides additional information specific to the City of Bakersfield, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Point of Contact

Primary Point of Contact

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1.2 Planning Methodology

The City of Bakersfield followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 1-1.

Table 1-1: Planning Committee Members

Planning Committee Members	Department
Chris Huot	Assistant City Manager
Brianna Carrier	Administrative Analyst III
John Frando	Deputy Fire Chief
Kevin Albertson	Fire Marshal
Robert Voyles	Operations Manager
Stuart Patteson, P.E.	Assistant Public Works Director
William Ballard	Deputy Fire Chief



Figure 1-1 City of Bakersfield Location

1.3 What's New

The City of Bakersfield has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions. Some mitigation actions have been completed and are highlighted in Table 1-3 The City determined to cancel some due to reprioritization, lack of funding, or other listed reasons. Table 1-2 lists those cancelled mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 1-12.

Table 1-2 Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Reason Cancelled
ma-FL-BK-203	Flood	Cancelled	2005	City of Bakersfield	Flood and storm damage mitigation by completing improvements recommended in the Downtown Bakersfield Drainage Study.	City of Bakersfield, Public Works Dept.	Some portions were completed (22nd St. Storm Drain) and others are rolled into 2014 ma-FL-BK-73

1.3.1 Mitigation Successes

Table 1-3 displays multiple important mitigation actions that have been completed by the City of Bakersfield. Some of the City's success stories are described in more detail herein.

Table 1-3 Completed Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party
ma-AH-BK-20	All Hazard	Completed	2014	City of Bakersfield	Repair or replace irrigation canal culverts under city streets	City of Bakersfield, Public Works Dept.
ma-FL-BK-21	Flood	Completed	2014	City of Bakersfield	Jewetta north of Stockdale Hwy drainage project	City of Bakersfield
ma-FL-BK-22	Flood	Completed	2014	City of Bakersfield	Panaman Ln @ Golden Gate sump	City of Bakersfield
ma-FL-BK-112	Flood	Completed	2005	City of Bakersfield	Tallisman Sump	City of Bakersfield
ma-FL-BK-113	Flood	Completed	2005	City of Bakersfield	Pump Stations at Beach Park and Pistol Range	City of Bakersfield
ma-FL-BK-116	Flood	Completed	2005	City of Bakersfield	Greenbelt Sump (Monitor Area)	City of Bakersfield Public Works
ma-FL-BK-96	Flood	Completed	2014	City of Bakersfield	Campus Park South Drainage Basin	City of Bakersfield Public Works

Success Story, New Backup Generators for Stormwater Pumps: The City installed two new backup generators for critical stormwater facilities in 2018. The project was funded through FEMA's Hazard Mitigation Grant Program.

Generators were installed at the water pump stations at Beach Park and the police pistol range. These generators are a critical element for flood protection needed to ensure the reliability of two stormwater pump stations that protect portions of the Westchester and downtown areas.



Figure 1-2. Completion Ceremony for New Backup Generator

Success Story, Talisman Sump: The City is nearing completion of replacement of the Talisman Storm Pump Station (ma-FL-BK-112). COVID-19 substantially delayed this project due to availability of submersible and vertical turbine pumps used in high volume storm pump stations. The project is projected to be completed in winter of 2021.

Success Story, Seismic Retrofits: The City has undertaken a comprehensive seismic retrofit program for City-owned bridges. The City is currently completing construction of the final bridge that qualifies under the retrofit program at Manor Street.

1.4 Risk Assessment

The intent of this section is to profile the City of Bakersfield's hazards and assess the City's vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

1.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 1-4. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the City of Bakersfield. Table 1-5 provides a crosswalk of hazards identified in Vol. 1 of this plan, the City of Bakersfield General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the City of Bakersfield and which ones were not. Section 1.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the City of Bakersfield.

Table 1-4. Hazard Prioritization

Hazard Type	Explanation
Climate Change	**High priority county wide, profiled as part of Flood, Wildfire, and Severe Weather hazard.**
Dam failure	**High priority county wide, profiled hazard.**
Drought	**High priority county wide, profiled hazard**
Dust Storms	**High priority county wide; profiled as part of Severe Weather**
Earthquake/ Geologic Hazards	**High priority county wide, profiled hazard**
Extreme Heat	**Profiled as part of Severe Weather hazard**
Extreme Cold	Extreme cold is rare in Kern County and not profiled in this plan
Flood	**High priority county wide, profiled hazard**
Hail	Hail events are rare in Kern County and not profiled in this plan
Fog	While fog events do occur within Kern County, they are rare and are not considered a priority
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this Plan.
High Winds/ Straight Line Winds	**High priority county wide, profiled as part of Severe Weather**
Insect Hazards	While insects including Africanized honey bee and pine bark beetle exist in Kern County, this was not considered a priority and pests are not profiled in this plan
Levee Failure	**High priority county wide, profiled as part of Dam Failure**
Lightning	Lightning was not identified as a priority for this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Radon	This hazard was not identified as a priority
Severe Thunderstorm	Severe thunderstorms are rare in Kern County and not profiled in this plan.
Slope Failure	**High priority county wide, profiled hazard**
Soil Hazards	**High priority county wide, profiled hazard**
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	**High priority county wide, profiled hazard**
Winter Storm / Freeze Events	**Profiled as part of Severe Weather hazard**

Table 1-5 Document Review Crosswalk

Hazards	2014 Kern County MJHMP	2002 Bakersfield General Plan	2009 Kern County General Plan	2018 California State HMP
Agricultural Pests				■
Climate Change	■			■
Dam Failure	■	■	■	■
Drought	■			■
Earthquake	■	■	■	■
Flood	■	■	■	■
Insect Hazards	■			
Landslide	■	■	■	■
Levee Failure	■			■
Manmade Hazards			■	■
Pandemic Disease	■			■
Sea Level Rise				■
Severe Weather	■			■
Soil Hazards	■	■	■	
Terrorism & Tech Hazards				■
Tsunami				■
Volcano	■			■
Wildfire	■		■	■

1.4.2 Hazard Risk Ranking

The City of Bakersfield's Planning Team used the same hazard prioritization process as the Kern County Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 1-3 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the City of Bakersfield's vulnerability to the following hazards:

- flood
- wildfire
- drought
- earthquake
- soil stability

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to address the City of Bakersfield's vulnerability to these specifically-identified hazards.

1.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the City of Bakersfield are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

1.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 1-3 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Kern County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the City of Bakersfield. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics.

1.4.3.2 Snapshot Exposure Maps

The included snapshot maps, displayed below in Figure 1-4 through Figure 1-10, illustrates the City of Bakersfield's vulnerability to specific hazards. Figures include:

- Figure 1-4: City of Bakersfield – FEMA Flood Zone Vulnerability & Exposure Snapshot
- Figure 1-5: City of Bakersfield – EQ S. San Andreas Mojave N. Vulnerability & Exposure Snapshot
- Figure 1-6: City of Bakersfield – Historic Fire Occurrence
- Figure 1-7: City of Bakersfield – Wildfire Return Intervals
- Figure 1-8: City of Bakersfield – Wildfire Vulnerability & Exposure Snapshot
- Figure 1-9: City of Bakersfield – Subsidence Vulnerability & Exposure Snapshot[1]
- Figure 1-10: City of Bakersfield – Drought Severity Timeline – Middle Kern-Upper Tehachapi-Grapevine

Based on the above risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard.

[1] Damage estimations are available on RAMP.

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - **Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Dam Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix or are grey in color, the jurisdictional planning team felt the hazard had a minimal footprint within their planning area and was not ranked.

Hazard Information / Legend:

- CLIMATE CHANGE — Climate change may change the frequency, duration and intensity of hazards within each planning area. If applicable Climate Change impacts are described at the end of each section.
- ALLUVIAL FANS — Alluvial Fan deposits and issues in Kern County. This hazard is profiled and defined under "Slope Failure" in Vol. 1 of this plan.
- SOIL STABILITY — Soil Stability in Kern County includes Land Subsidence and Wind Erosion. Definitions for each are described in Vol. 1. of this plan.
- SOIL STABILITY — If hazard symbol is grey or not present, the jurisdictional planning team did not develop hazard vulnerability information related to the planning areas due to perceived probability and impact described above.

City Of Bakersfield Risk Matrix

PROBABILITY \ IMPACT	Minor	Limited	Critical	Catastrophic
Highly Likely	Medium	DROUGHT	Extreme	Extreme
Likely	Medium	FLOOD, WILDFIRE	EARTHQUAKE	Extreme
Possible	EXTREME WEATHER	Medium	SOIL STABILITY	High
Unlikely	SLOPE FAILURE	Low	Medium	DAM FAILURE

Figure 1-3: City of Bakersfield Risk Assessment

FEMA/Cal OES Submission 05-19-2021

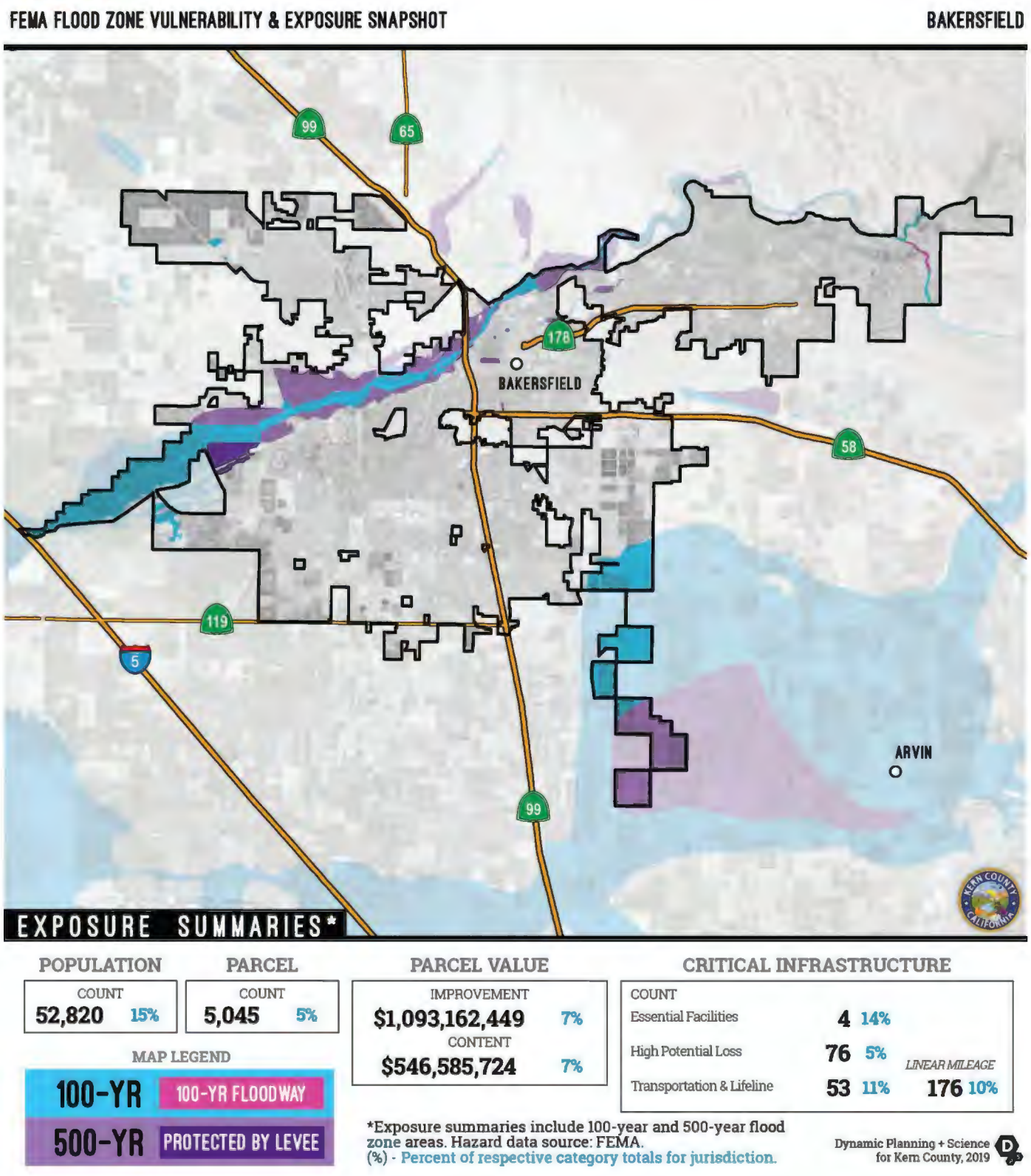


Figure 1-4: City of Bakersfield – FEMA Flood Zone Vulnerability & Exposure Snapshot

FEMA/Cal OES Submission 05-19-2021

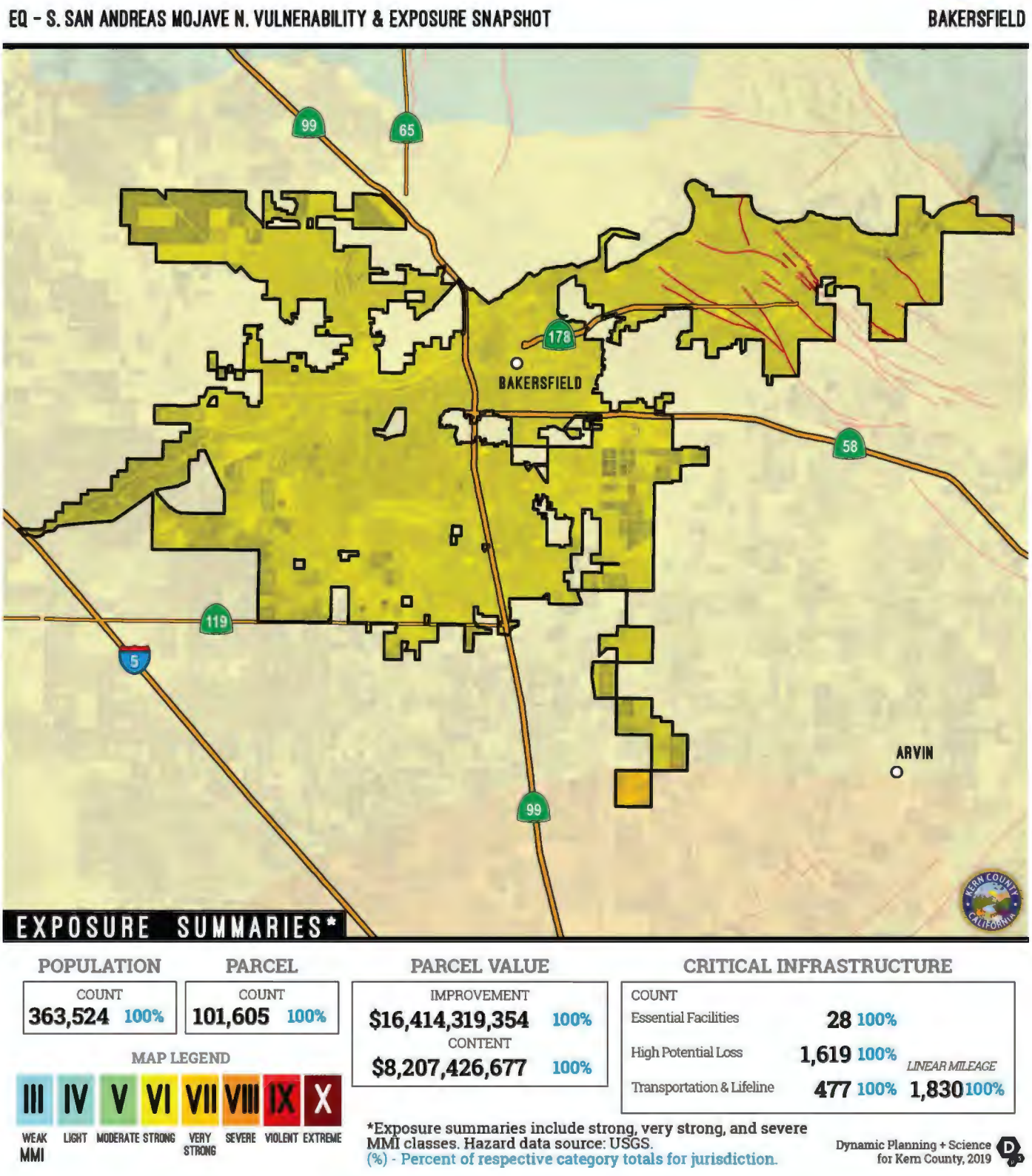


Figure 1-5: City of Bakersfield – EQ S. San Andreas Mojave N. Vulnerability & Exposure Snapshot

FEMA/Cal OES Submission 05-19-2021

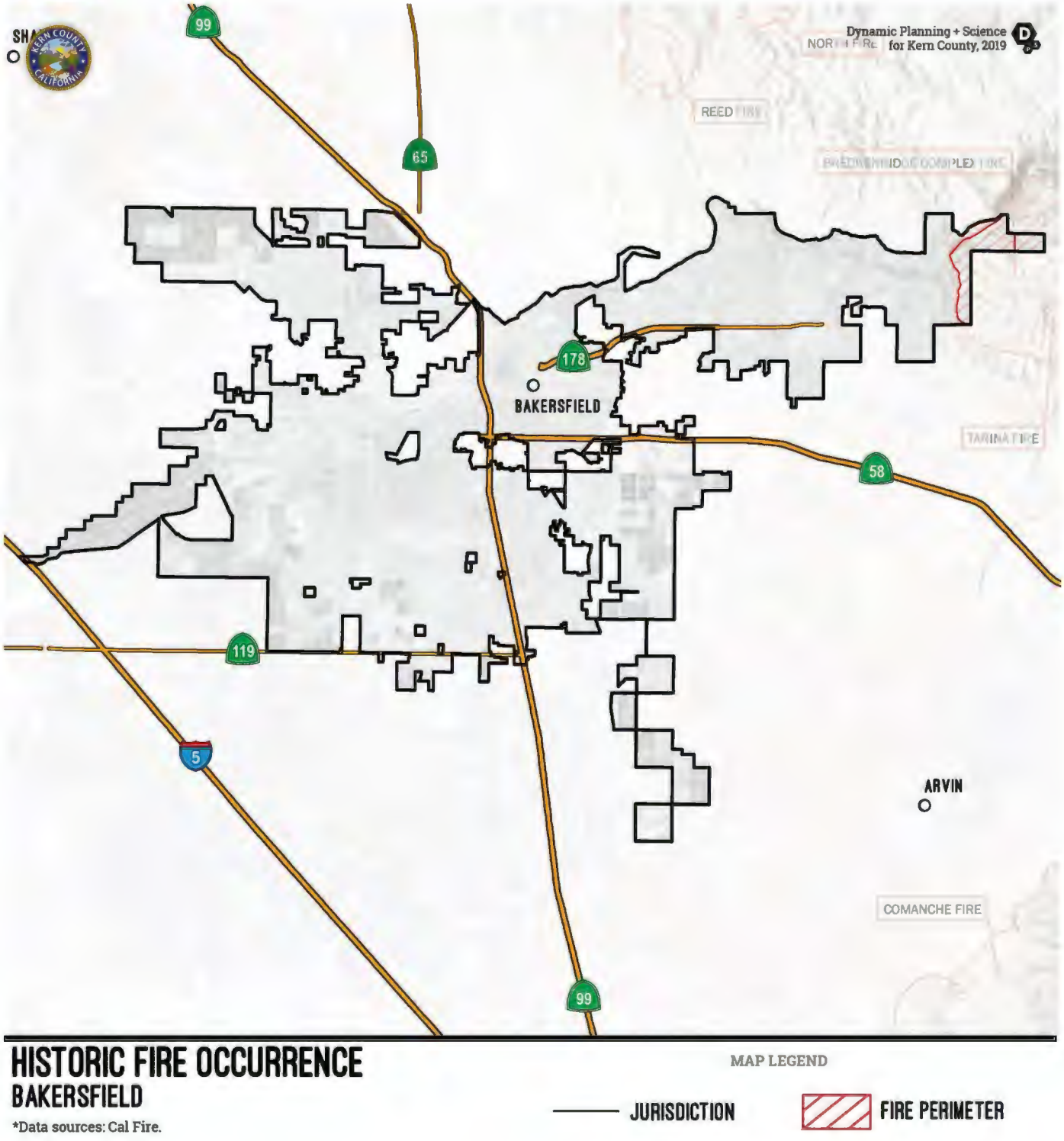


Figure 1-6: City of Bakersfield – Historic Fire Occurrence

FEMA/Cal OES Submission 05-19-2021

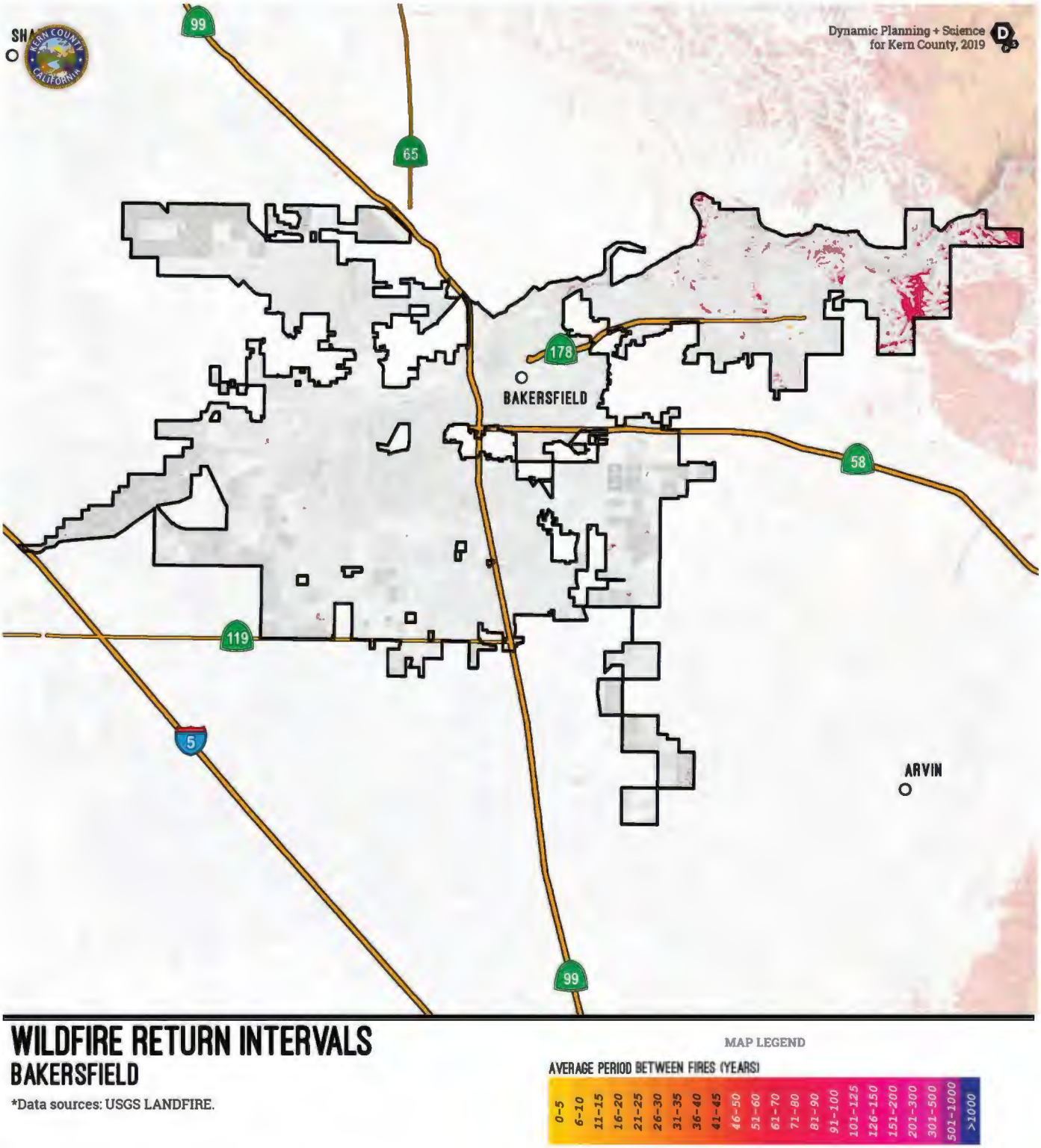


Figure 1-7: City of Bakersfield – Wildfire Return Intervals

FEMA/Cal OES Submission 05-19-2021

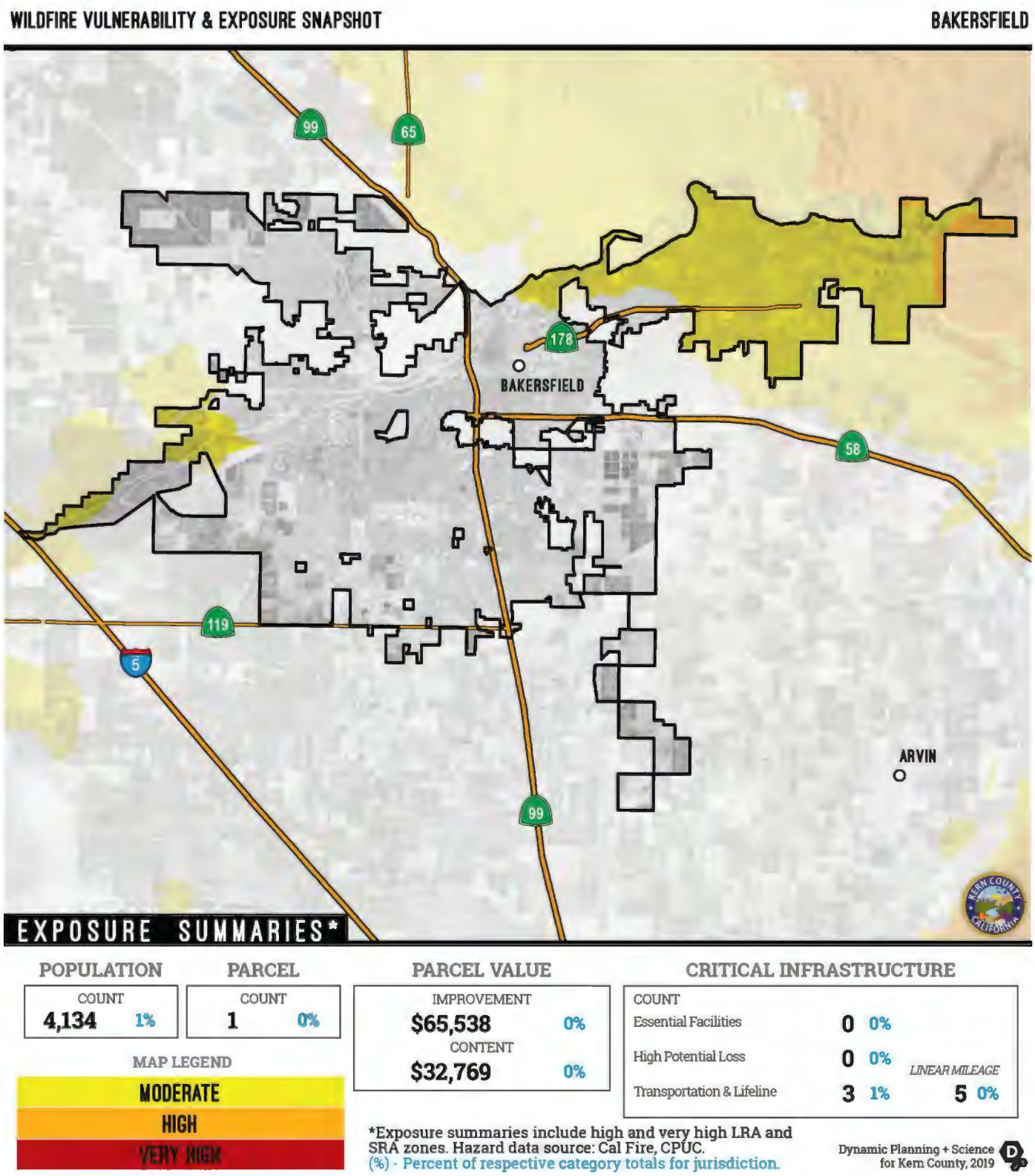


Figure 1-8: City of Bakersfield – Wildfire Vulnerability & Exposure Snapshot

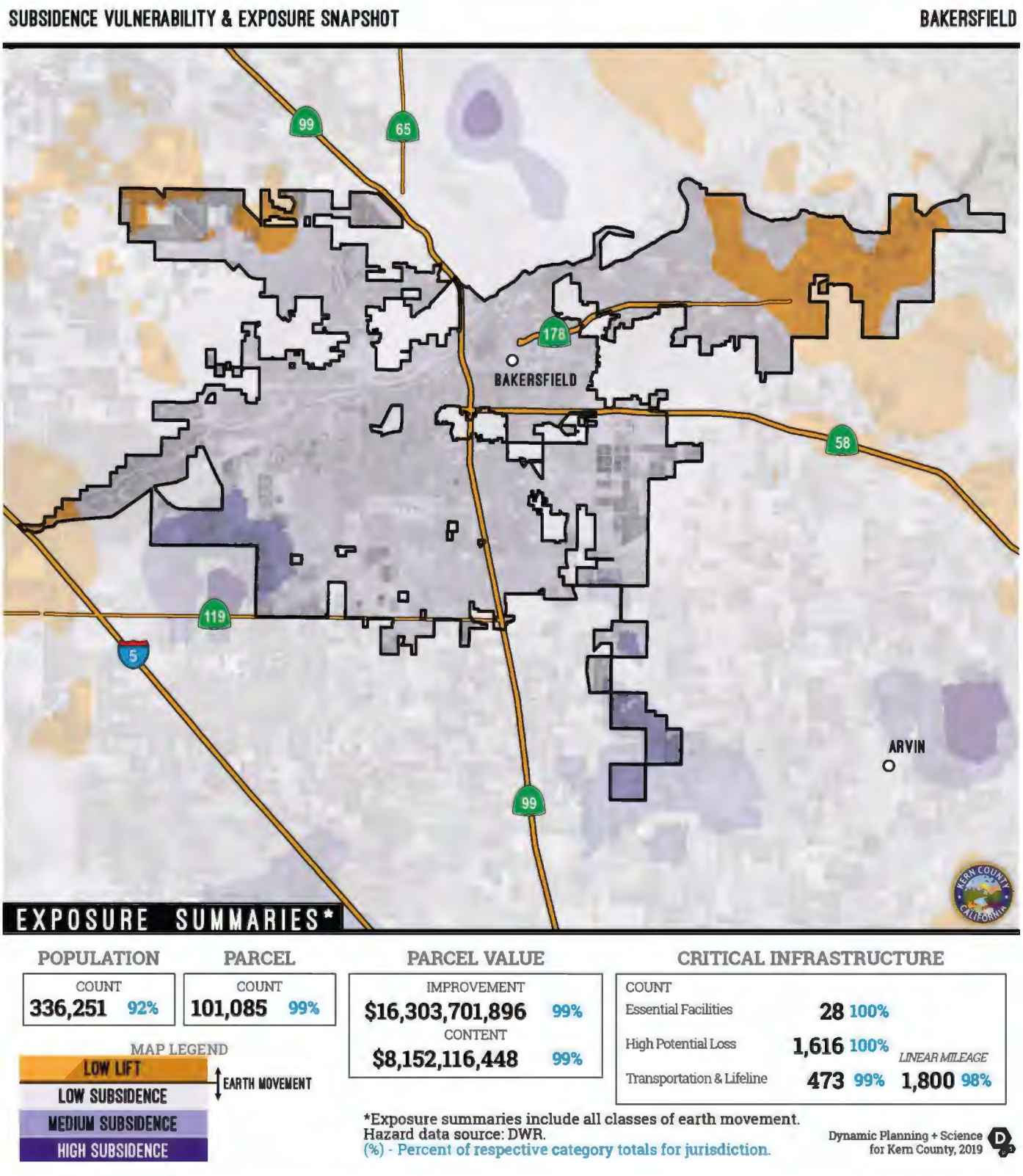


Figure 1-9: City of Bakersfield – Subsidence Vulnerability & Exposure Snapshot

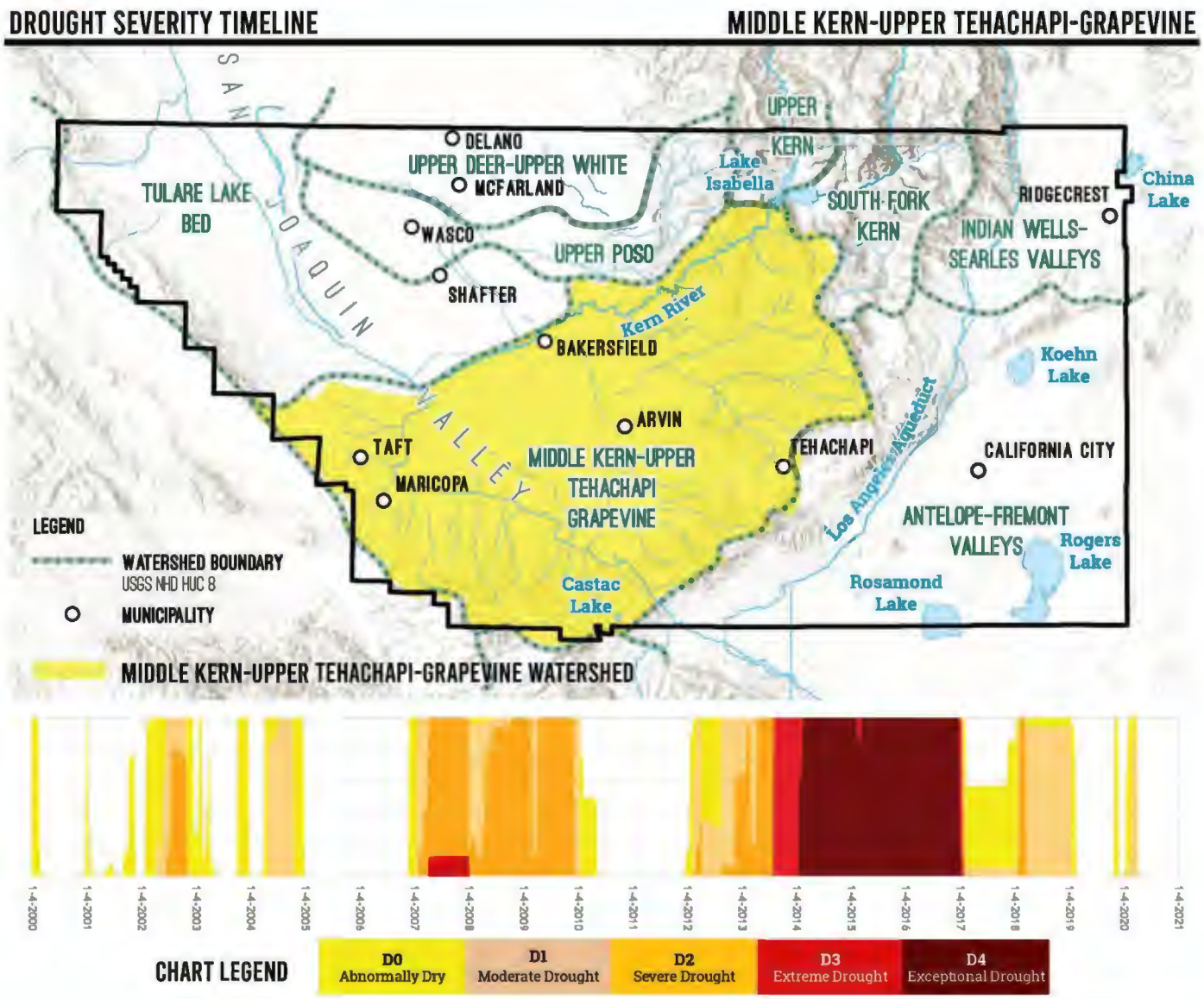


Figure 1-10: City of Bakersfield – Drought Severity Timeline – Middle Kern-Upper Tehachapi-Grapevine

1.4.3.3 Past and Future Development

The City of Bakersfield is a charter city that crafts its own laws related to municipal affairs, including future development. If the City has not regulated, or the issue is not municipal in nature, the City is subject to State law. Future development may be subject to compliance with State of California planning, zoning, subdivision, and architecture laws.

The City of Bakersfield's General Plan (GP) establishes long-range development policies. The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

Development since Previous HMP

The City considered its growth since the last HMP and determined it had completed a central mitigation action and substantially decreased its vulnerability to hazards. The City installed new back-up generators for stormwater pumps, they have also implemented a seismic retrofit program of local bridges. This HMP Annex has been revised to reflect this substantial change in past development and continues to focus on avenues to better mitigate impacts from problematic past development. This is especially important as the District does not regulate future development and instead provides services and infrastructure to such development.

Future Development

City of Bakersfield is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum develop standards, all jurisdictions belong to the NFIP, as such, all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Kern County.

As the General Plan is updated and incorporates information from this HMP, City of Bakersfield staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Bakersfield reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan. See Section 1.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.

The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

The City of Bakersfield's current General Plan was adopted in 2002, with amendments occurring at various points since that time. Since the adoption of the General Plan and its amendments, there have been significant changes in demographics, existing conditions, land use, and economic and social trends in Bakersfield and the larger region. The beginning of a comprehensive update to the General Plan acknowledges the significant changes of the past and plans for the significant changes that will occur in the future. In addition to changes to the existing setting, changes in data gathering and modeling capabilities have dramatically improved in the past 20 years, allowing more accurate analysis of future impacts and to better predict potential hazard impacts on the city. The comprehensive update of the General Plan will strengthen the HCP, acting as a policy tool in identifying hazards and assisting the HCP in providing guidance in hazard mitigation into the future.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Kern County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Bakersfield has participated in the NFIP since 1985. The City of Bakersfield is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 1-6 for more information on the City's policies and historic flood insurance claims.

Table 1-6: NFIP Status Table

NFIP Status	Participating since 5/01/1985
Policies in Force	605
Policies in SFHA	17
Policies in non-SFHA	588
Total Claims Paid	25
Paid Losses	$ 63,276
Repetitive Loss Properties	4
Severe Repetitive Loss Properties	0
Repetitive Loss Payment by NFIP on Building	N/D
Repetitive Loss Payment by NFIP on Contents	N/D

Note: N/D signifies no data.

See Volume 1, Section 4.5 for more information on the NFIP.

1.4.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 1-11. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 1-7.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 1-12 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 1-7 and Table 1-12.

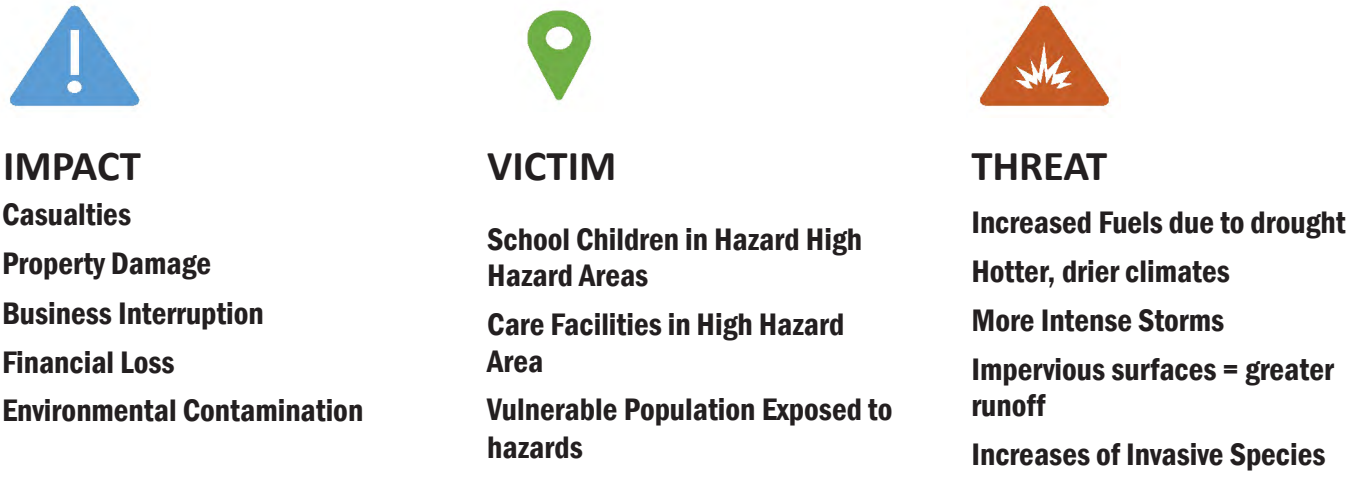


Figure 1-11. Guidance for Problem Statements

Table 1-7 Problem Statements

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-BK-508	All Hazard	Impact	ES - Emergency Services	**City of Bakersfield**	City has generator needs for critical facilities during PSPS events	ma-AH-BK-552
ps-DR-BK-493	Drought	Impact	PRV - Prevention , PPRO - Property Protection	**City of Bakersfield**	Drought can lead to lower groundwater levels and quality and potentially create undesirable result in groundwater sustainability plan	ma-DR-BK-553
ps-DR-BK-494	Drought	Impact	PRV - Prevention , NRP - Natural Resource Protection	**City of Bakersfield**	Drought may increase subsidence and degrade water quality, including increase in arsenic and other harmful chemicals	ma-DR-BK-553
ps-DR-BK-495	Drought	Threat	PRV - Prevention	**City of Bakersfield**	Drought is occurring more often and for longer periods as a result of climate change	ma-DR-BK-553
ps-EQ-BK-496	Earthquake		PRV - Prevention	**City of Bakersfield**	Levee recertifications are ongoing and necessary in event of earthquake; last part of recertification slated between Chester and Manor on N. side of the river	ma-EQ-BK-562
ps-EQ-BK-497	Earthquake	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**City of Bakersfield**	360,000 residents would be subject to strong shaking resulting from a 7.2 magnitude earthquake on the San Andreas fault, while 2,650 residents would be subject to very strong shaking; 288,000 residents would be subject to strong shaking resulting from a 7.2 magnitude earthquake on the White Wolf fault, while 75,000 residents would be subject to very strong shaking.	ma-EQ-BK-554, ma-EQ-BK-555
ps-EQ-BK-498	Earthquake	Victim	PPRO - Property Protection , SP - Structural Projects	**City of Bakersfield**	City has a history of EQ impacts in downtown (1952) with unreinforced masonry, especially with basements under PROW and tunnels	ma-EQ-BK-554, ma-EQ-BK-555
ps-EQ-BK-499	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Bakersfield**	Potential for liquefaction as closer to bike path and river according to soil report – it's a small area	ma-EQ-BK-554

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-FL-BK-500	Flood		PRV - Prevention , PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**City of Bakersfield**	Flooding most often occurs as a result of overflowing retention basins or prolonged rain events where retention basins don't have time to drain down – will then pump to a different basin or send to sewer system. Includes Westchester/downtown (Part Circle culverts) – central Bakersfield from Westchester to Oak (F to Oak); east of Chester; Includes Talisman area, where City is currently constructing a lift station.	ma-FL-BK-73, ma-FL-BK-72, ma-FL-BK-551, ma-FL-BK-550, ma-FL-BK-114, ma-FL-BK-115
ps-FL-BK-501	Flood	Victim	PRV - Prevention , SP - Structural Projects	**City of Bakersfield**	Approximately 29,400 residents living within or near the 100-year floodplain and 23,400 within or near 500-year floodplain. Approximately 129 residents in proximity to floodway.	ma-FL-BK-73, ma-FL-BK-72, ma-FL-BK-550
ps-FL-BK-502	Flood	Impact	PRV - Prevention , PPRO - Property Protection , SP - Structural Projects	**City of Bakersfield**	4 High Potential Loss Facilities within 100-YR Flood Zone (2 Health Care Facilities, 1 Home Care Organization, and 1 Dam)	ma-FL-BK-73, ma-FL-BK-550, ma-FL-BK-551
ps-FL-BK-503	Flood	Impact	PRV - Prevention , PPRO - Property Protection , SP - Structural Projects	**City of Bakersfield**	21 Transportation and Lifeline assets within 100-YR Flood Zone (11 bridges and 10 transmission line towers)	ma-FL-BK-549
ps-FL-BK-614	Flood	Impact	PRV - Prevention , PPRO - Property Protection	**City of Bakersfield**	The City's servers, managed by the Technology Services Department, are currently housed in the basement of City Hall South. In the event of a flooding emergency, City technology infrastructure has the potential to be dangerously compromised.	ma-FL-BK-549

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-SS-BK-504	Soil Stability	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**City of Bakersfield**	Some subsidence in downtown area – streets sinking in somewhat due to soil composition - including areas such as H Street, Fairfax, L, 21st & M. There are a few "minor", sinking or subsidence locations on come City streets. The streets listed are some and most of them have already been repaired including H Street, 21st St, and L St. I would not list it as a Citywide problem. Also to my knowledge we have never had a Geotechnical study done of the soil itself to determine if it is truly a "subsidence" or soil stability problem or possibly poor compaction, former tunnel, or other possible cause	ma-SS-BK-558
ps-WF-BK-505	Wildfire	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Bakersfield**	Property damage resulting from wildfire encroachment at the wildland-urban interface.	ma-WF-BK-559, ma-WF-BK-560
ps-WF-BK-506	Wildfire	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services	**City of Bakersfield**	Approximately 79,000 residents living within moderate wildfire risk areas (mostly in northeastern part of the city) and 4,100 within high risk areas.at the eastern edge of the city. 4 Essential Facilities within moderate wildfire risk areas (2 fire stations, 1 sheriff facility, and 1 emergency operations center); 79 High Potential Loss Facilities within moderate wildfire risk areas, including 29 special needs facilities, 15 childcare centers, 12 schools, and 7 adult care facilities,	ma-WF-BK-560
ps-WF-BK-507	Wildfire	Threat	PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Bakersfield**	SE portion of City requires hazard reduction efforts (most likely through code enforcement and fire prevention efforts in coordination with County)	ma-WF-BK-559, ma-WF-BK-560

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-WF-BK-509	Wildfire	Threat	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Bakersfield**	City is experiencing increased vegetative fuel resulting from climate-related drought.	ma-WF-BK-560, ma-WF-BK-561

1.4.4.1 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through http://mitigatehazards.com/county-of-kern/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction's ability to apply for FEMA's Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.

1.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

1.5.1 Capabilities Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.

1.5.1.1 Planning and Regulatory Capabilities

Table 1-8. Planning and Regulatory Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

	HMP Integration			
Resource	Status	Current Mitigation Use	Future Opportunity	**Notes / Additional Detail**
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				Title 15 of the Bakersfield Municipal Code (BMC) - Buildings and Construction https://bakersfield.municipal.codes/Code/15
BCEGS Rating				
Public Protection (ISO Class)				ISO Rating: Class 2
Hazard Related Development Standards				BMC Title 15 - Buildings and Construction -15.05.070 -Geologic or Flood Hazards -15.40 - Earthquake Hazard Reduction in Existing Unreinforced Masonry Bearing Wall Buildings -15.41 Seismic Safety Administration of Unreinforced Masonry Buildings BMC Chapter 15.74 - Flood Damage Protection
Zoning Ordinance				Title 17 of the BMC - Zoning https://bakersfield.municipal.codes/Code/17
Hazard-Specific Ordinance				BMC Chapter 17.42 - FP-P Floodplain Primary Zone BMC Chapter 17.44 - FP-S Floodplain Secondary Zone BMC Chapter 17.66 - HD (Hillside Development) Combining Zone
Growth Management Ordinance				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				
Erosion/Sediment Control Program				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Hazard-Related Public Outreach Program				See Education and Outreach Resource Capabilities.
Stormwater Management Program (Annual Inspections)				
Seismic Safety Program (Non-structural)				
Earthquake Modernization Plan (Building Safety)				
Hazard Plans				
General Plan Safety Element				
Community Wildfire Protection Plan (CWPP)				Countywide CWPP expected 2021.
Floodplain Management Plan				
Stormwater Management Plan				The City's Stormwater Management Plan is coordinated between Public Works, Water Resources, and Development services City of Bakersfield shares joint National Pollutant Discharge Elimination System (NPDES) with Kern County - last updated 2016. City of Bakersfield submits annual reports to the Central Valley Regional Water Quality Control Board
Emergency Operations Plan				
Climate Action Plan				Will be prepared as part of General Plan update
Ground Water Management Planning / Plans				Sustainble Groundwater Management Act (SGMA) planning; The City of Bakersfield participates in the Kern River Groundwater Sustainability Agency - a subset of KRGSA is the Groundwater Sustainability Plan (GSP)
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				
Flood Insurance Education and Technical Assist.				
Flood Hazard Mapping / Re-Mapping				Re-mapping currently underway
Community Rating System (CRS)				

FEMA/Cal OES Submission 05-19-2021

1.5.1.2 Administrative and Technical Capabilities

Table 1-9. Administrative and technical capabilities summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Planning Director
Civil Engineer				Public Works Director
Building Code Official (Full time or Augmented)				Building Director
Floodplain Administrator				Building Director; with assistance from Water Resources
Fire Marshal				Fire Chief
Dedicated Public Outreach Personnel				Public Information Office - City Manager's Office
GIS Specialist and Capability				GIS capabilities in Development Services and Technology Services Departments
Emergency Manager				City Manager
Full-Time Building Official				Building Director
Grant Manager, Writer, or Specialist				
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				The City has a voluntary mobile application for notifications - Atlas One
Flood				
Wildfire				
Geological Hazards				

1.5.1.3 Financial Capabilities

Table 1-10. Financial capabilities summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				
Utilities Fees				BMC Chapter 3.04.130 - All moneys deposited to the roads program utility franchise fee and surcharge fund shall be used for the purpose of funding capital improvements related to the city's roads program, including, but not limited to, the payment of debt service or other types of payments related to obligations incurred in connection with the financing of such capital improvements
Benefit assessments				
System Development Fee				
General Obligation Bonds to Incur Debt				
Special Tax Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas				
Stormwater Service Fees				Kern River Levee special district under LAFCO. Revenue comes to City Water Resources Department to assist with levee maintenance
Capital Improvement Project Funding				

1.5.1.4 Education and Outreach

Table 1-11. Education and outreach capabilities summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils				
Resource Conservation Districts				Improvement District-4; provides water conversation educational materials. Captures 75% of elementary schools within City.
Other	N/A	N/A	N/A	

1.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction's priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 1-12 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

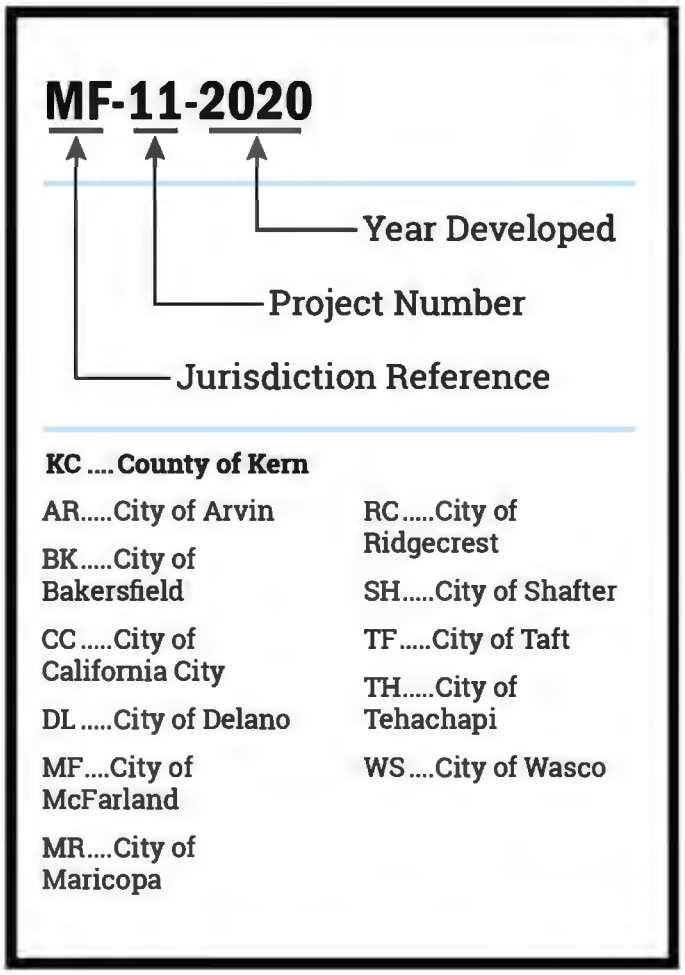


Figure 1-12. Mitigation Action Key

Each participating jurisdiction, including the City of Bakersfield, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the City of Bakersfield has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

Table 1-12 lists each mitigation action for the City of Bakersfield. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 1-12 meets the regulatory requirements of FEMA and DMA 2000.

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Table 1-12. City of Bakersfield Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-BK-552	All Hazard	SP - Structural Projects	Pending	2020	City of Bakersfield	Install emergency backup generators for fire stations where not currently installed, emergency shelters, animal shelter, wastewater lift stations, and City office facilities. City has particular need for generator in Fire Station #3.	Building and Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	5%	HMGP / BRIC	High	ps-AH-BK-508
ma-DR-BK-553	Drought	NRP - Natural Resource Protection	Pending	2020	City of Bakersfield	Install drought tolerant landscaping in the public right of way and City-owned buildings and facilities.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Project	HMGP / BRIC	Low	ps-DR-BK-493, ps-DR-BK-494, ps-DR-BK-495
ma-EQ-BK-554	Earthquake	PE&A - Public Education & Awareness	Pending	2020	City of Bakersfield	Conduct outreach to encourage privately owned critical facilities (e.g. churches, hotels, other gathering facilities) to evaluate the ability of the buildings to withstand earthquakes and to address any deficiencies identified.	Public Information Office	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	Ongoing	5%	HMGP / BRIC	Low	ps-EQ-BK-497, ps-EQ-BK-498, ps-EQ-BK-499
ma-EQ-BK-555	Earthquake	PPRO - Property Protection	Pending	2020	City of Bakersfield	Install seismic shut-off valves on gas fixtures on City-owned facilities.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-EQ-BK-497, ps-EQ-BK-498
ma-EQ-BK-562	Earthquake	PRV - Prevention	Ongoing	2020	City of Bakersfield	Continue pursuing levee recertification between Chester and Manor on the north side of the Kern River	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	N/A	Internal Funding	Extreme	ps-EQ-BK-496
ma-FL-BK-114	Flood	SP - Structural Projects	Pending	2005	City of Bakersfield	Divert flow at Landfair Sump to reduce flooding impacts	City of Bakersfield Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Funding Dependent	Project	HMGP / BRIC	Medium	ps-FL-BK-500

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-FL-BK-115	Flood	PPRO - Property Protection	Pending	2005	City of Bakersfield	Complete Elcia and Real drainage project to connect to county storm drain system	City of Bakersfield Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Funding Dependent	Project	HMGP / BRIC	Medium	ps-FL-BK-500
ma-FL-BK-72	Flood	PRV - Prevention	Pending	2014	City of Bakersfield	Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program	Building Division, Planning Division, Public Works Department, Water Resources Department	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Planning	HMGP / BRIC , FMA	Medium	ps-FL-BK-500, ps-FL-BK-501
ma-FL-BK-73	Flood	PPRO - Property Protection	Pending	2014	City of Bakersfield	Implement Citywide Drainage Basin Maintenance Projects: Basins #212, #139, #55, #69, #277	0	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FMA	Medium	ps-FL-BK-500, ps-FL-BK-501, ps-FL-BK-502
ma-FL-BK-549	Flood	PPRO - Property Protection	Pending	2020	City of Bakersfield	Technology Services City Server Relocation	Public Works and Building	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-FL-BK-614, ps-FL-BK-503
ma-FL-BK-550	Flood	PPRO - Property Protection	Pending	2020	City of Bakersfield	Installation of backup generators for storm water pump stations at critical locations throughout the City, including along Highway construction projects and locations adjacent to residential neighborhoods.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	Project	HMGP / BRIC	Medium	ps-FL-BK-501, ps-FL-BK-502, ps-FL-BK-500
ma-FL-BK-551	Flood	PPRO - Property Protection	Pending	2020	City of Bakersfield	Incorporate the SCADA system mechanism for pump lift stations.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	Project	HMGP / BRIC , FMA	Medium	ps-FL-BK-502, ps-FL-BK-500

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-SS-BK-558	Soil Stability	PPRO - Property Protection	Ongoing	2020	City of Bakersfield	Conduct subsidence investigations in downtown Bakersfield, including areas such as H Street, Fairfax, L, 21st & M	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC	High	ps-SS-BK-504
ma-WF-BK-559	Wildfire	ES - Emergency Services	Ongoing	2020	City of Bakersfield	Implement additional fire protection code enforcement and coordinate potential shared enforcement with County	City Administration, Planning	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	N/A	Internal Funding	High	ps-WF-BK-507, ps-WF-BK-505
ma-WF-BK-560	Wildfire	PE&A - Public Education & Awareness	Pending	2020	City of Bakersfield	Develop public outreach program for residents in WUI areas of city, including improved website content and targeted outreach.	POI	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	5%	HMGP / BRIC , AFG , EMPG	High	ps-WF-BK-505, ps-WF-BK-506, ps-WF-BK-507, ps-WF-BK-509
ma-WF-BK-561	Wildfire	PPRO - Property Protection	Pending	2020	City of Bakersfield	Implement fuels reduction program around City-owned critical facilities	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	N/A	AFG , FP&S , Internal Funding	Extreme	ps-WF-BK-509

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Appendix J:

2021 Domestic Water System
Water Rate Schedule

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EFFECTIVE JULY 1, 2021

City of Bakersfield
Department of Water Resources
Water Rates for
City Domestic Water Service and Fairhaven Water Service Area

SCHEDULE OF RATES

General Metered Service

	Current Rates	
	Within City Limits	Fairhaven & Unincorporated Areas
Quantity Rates:		
Per 100 cubic ft/month	$ 1.13	$ 1.23

Monthly Readiness-To-Serve Charge:

5/8" x 3/4" Service	$ 11.92	$ 13.36
1" Service	$ 18.17	$ 20.36
1-1/2" Service	$ 27.73	$ 31.06
2" Service	$ 37.73	$ 42.30
3" Service	$ 69.73	$ 78.15
4" Service	$ 101.36	$ 113.59
6" Service	$ 182.17	$ 204.15
8" Service	$ 280.03	$ 313.82
10" Service	$ 385.99	$ 432.58

Monthly Private Fire Protection Service Charge:

1-1/2" Connection	$ 11.25	$ 12.62
2" Connection	$ 15.01	$ 16.82
3" Connection	$ 22.52	$ 25.22
4" Connection	$ 30.00	$ 33.63
6" Connection	$ 45.00	$ 50.43
8" Connection	$ 60.01	$ 67.25
10" Connection	$ 75.00	$ 84.06
12" Connection	$ 90.01	$ 100.88

"Monthly Readiness-To-Serve Charge" is applied to all services and any quantity of water used is an additional charge computed a the quanity rate.

Conditions of service remain the same.

Reconnection Fees	
Collect @ Door	$15.00
Reconnection	$25.00
After Hours	$65.00
Cage & Lock	$30.00
NSF	$10.00

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Appendix K:

UWMP Act Checklist

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Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Section 1
X	X	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Section 1.04
X	X	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2
X	X	Section 2.6	10620(d)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.02
X	X	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.02
X		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.02

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
	X	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.02
X	X	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3.01
X	X	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.02
X	X	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 3.03
X	X	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.03
X	X	Section 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.03 and Section 5.01
X	X	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.04
X	X	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.01
X	X	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.02
X	X	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 4.03

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.03
X	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.02
X	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.03
X	X	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.04
X		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Section 5
X		Section 5.1	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.04
	X	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 9
X		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	NA

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.03
X		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Section 5.04
X	X	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 6 and Section 7
X	X	Section 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System Supplies	Section 6 and Section 7
X	X	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6 and Section 7
X	X	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.08
X	X	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.09
X	X	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.02

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.02
X	X	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.02
X	X	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.02
X	X	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2
X	X	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.02
X	X	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.09
X	X	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.07

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.05
X	X	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.05
X	X	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.05
X	X	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.05
X	X	Section 6.2.5	10631(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.05 and 6.08
X	X	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.05 and 6.08
X	X	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.06
X	X	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier’s service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.05

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 6.2.8 Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.08 and Section 7
X	X	Section 6.2.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Supplies, Energy Intensity	Section 6.11
X	X	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.01
X	X	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.02
X	X	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.01
X	X	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.03

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.03
X	X	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.01
X	X	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.03
X	X	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.03
X	X	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Section 8 and Appendix F
X	X	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix F
X	X	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix F

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix F
X	X	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix F
X	X	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Section 8.03 and Appendix F
X	X	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	NA
X	X	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Section 8.03 and Appendix F
X	X	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 8.04 and Appendix F
X	X	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Section 8.04 and Appendix F

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Section 8.04 and Appendix F
X	X	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Section 8.04 and Appendix F
X	X	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Planning	Section 8.04.1, Appendix F, and Appendix 1
X	X	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix F
X	X	Section 8.5	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix F
X	X	Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix F
X	X	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix F
X	X	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix F
X	X	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix F

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix F
X	X	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix F
X		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Appendix F
X		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix F
X		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix F
X	X	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 8.12, Section 10.02, and Appendix F
X	X	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Section 8.12, Section 10.02, and Appendix F

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
	X	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Section 9
X		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Section 9
X		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10
X	X	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10
X	X	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10
X	X	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Section 10.02

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10 and Appendix A
X	X	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.02
X	X	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.02
X	X	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.02
X	X	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.02
X	X	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.02
X	X	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.02
X	X	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	NA

Retail	Wholesale	**2020 Guidebook Location**	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
X	X	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	NA

2020 Urban Water Management Plan

Bakersfield District

June 2021

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List of Acronyms

AB	Assembly Bill
AF	acre-feet
AFY	acre-feet per year
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
AWWA	American Water Works Association
CAP	Customer Assistance Program
CCR	California Code of Regulations
CII	Commercial, Institutional, and Industrial
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DDW	Division of Drinking Water
DMM	Demand Management Measure
DWR	Department of Water Resources
EPA	Environmental Protection Agency
ft	feet
GPCD	gallons per capita per day
GRC	General Rate Case
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HGWTP	Henry C. Garnett Water Treatment Plant
ILI	Infrastructure Leakage Index
IRWMP	Integrated Regional Water Management Plan
KCWA	Kern County Water Agency
KGA	Kern Groundwater Authority
KRGSA	Kern River Groundwater Sustainability Agency
kWh	kilowatt hours
kWh/AF	kilowatt hours per acre-foot
M&I	Municipal and Industrial
MCL	Maximum Contaminant Level
MGD	million gallons per day
NEBWTP	Northeast Bakersfield Water Treatment Plant
NGWTP	North Garden Water Treatment Plant
PWS	Public Water System
RA	Regional Alliance
RUWMP	Regional Urban Water Management Plan
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act

SWP	State Water Project
SWRCB	State Water Resources Control Board
TAP	Technical Assistance Program
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant

Chapter 1
Introduction and Overview

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP or Plan), the relationship of this Plan to the California Water Code (CWC), the relationship of this Plan to other local and regional planning efforts, and how this Plan is organized and developed in general accordance with the UWMP Guidebook 2020.[1] Specifically, this chapter contains the following sections:

1.1 Background and Purpose

1.2 Urban Water Management Planning and the California Water Code

1.3 Relationship to Other Planning Efforts

1.4 Plan Organization

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

1.6 Lay Description

1.1 Background and Purpose

California Water Service Company (Cal Water) is an investor-owned public utility supplying water service to approximately 1.8 million Californians through over 481,000 connections. Its 25 districts serve 63 communities spanning from the Chico-Hamilton City District in the northern portion of the state to the Palos Verdes District in southern California. California Water Service Group, Cal Water's parent company, also provides water service to communities in Washington, New Mexico, and Hawaii.[2] While water rates are set separately for each of Cal Water's 25 districts, oversight of the water rate setting process and district operations is provided by the California Public Utilities Commission (CPUC).

Cal Water's Bakersfield District (also referred to herein as the "District") was formed in 1926 with the purchase of Bakersfield Water Works.

This UWMP is a foundational document and source of information about Bakersfield District's historical and projected water demands, water supplies, supply reliability and potential

[1] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans
[2] In addition, Cal Water operates the City of Hawthorne's water system on behalf of the City.

vulnerabilities, water shortage contingency planning, and demand management programs. Among other things, it is used as:

- A long-range planning document by Cal Water for water supply and system planning; and
- A source for data on population, housing, water demands, water supplies, and capital improvement projects used in:
    - Regional water resource management plans prepared by wholesale water suppliers and other regional planning authorities (as applicable),
    - General Plans prepared by cities and counties, and
    - Statewide and broad regional water resource plans prepared by the California Department of Water Resources (DWR), the State Water Resources Control Board (SWRCB), or other state agencies.

The District's last UWMP was completed in 2016, referred to herein as the "2015 UWMP." This Plan is an update to the 2015 UWMP and carries forward information from that plan that remains current and relevant, and provides additional information as required by subsequent amendments to the UWMP Act (CWC §10610 – 10657). Although this Plan is an update to the 2015 UWMP, it was developed to be a self-contained, stand-alone document and does not require readers to reference information contained in previous UWMP updates.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to submit this plan to the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP (CWC §10617).

The UWMP Act was enacted in 1983. Over the years it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009 as a result of the governor's call for a statewide 20 percent reduction in urban water use by 2020, referred to as "20x2020," the Water Conservation Act of 2009, and "SB X7-7." This amendment required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. Beginning in 2016, urban retail water suppliers were required to comply with the water conservation requirements in SB X7-7 in order to be eligible for state water grants or loans. Chapter 5 of this plan contains the data and calculations used to determine compliance with these requirements.

A subsequent substantial revision to the UWMP Act was made in 2018 through a pair of bills (i.e., Assembly Bill 1668 and Senate Bill 606), referred to as "Making Water Conservation a California

Way of Life" or the "2018 Water Conservation Legislation." These changes include, among other things, additional requirements for Water Shortage Contingency Plans (WSCPs), expansion of dry year supply reliability assessments to a five-year drought period, establishment of annual drought risk assessment procedures and reporting, and new conservation targets referred to as "annual water use objectives," which will require retailers to continue to reduce water use beyond the 2020 SB X7-7 targets. The UWMP Act contains numerous other requirements that an UWMP must satisfy. Appendix A to this Plan lists each of these requirements and where in the Plan they are addressed.

1.3 Relationship to Other Planning Efforts

This Plan provides information specific to water management and planning by the Bakersfield District. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these relevant planning documents include relevant city and county General Plans, Water Master Plans, Recycled Water Master Plans, integrated resource plans, Integrated Regional Water Management Plans, Groundwater Management Plans, Groundwater Sustainability Plans, and others.

This Plan is informed by and helps to inform these other planning efforts. In particular, this Plan utilizes information contained in city and county General Plans and local and regional water resource plans to the extent data from these plans are applicable and available.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in the UWMP Guidebook 2020.[3]

Chapter 1 - Introduction and Overview

Chapter 2 - Plan Preparation

Chapter 3 - System Description

Chapter 4 - Water Use Characterization

Chapter 5 - SB X7-7 Baseline and Targets

Chapter 6 - Water Supply Characterization

[3] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans

Chapter 7 - Water Supply Reliability Assessment

Chapter 8 - Water Shortage Contingency Planning

Chapter 9 - Demand Management Measures

Chapter 10 - Plan Adoption, Submittal, and Implementation

In addition to these ten chapters, this Plan includes a number of appendices providing supporting documentation and supplemental information. Pursuant to CWC §10644(a)(2), this Plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This Plan also includes additional tables, figures, and maps to augment the set developed by DWR, as appropriate. The table headers indicate if the table is part of DWR's standardized set of submittal tables.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

Although not required by the UWMP Act, in the UWMP Guidebook 2020,[4] DWR recommends that all suppliers that are participating in, or may participate in, receiving water from a proposed project that is considered a "covered action" under the Delta Plan—such as a (1) multiyear water transfer; (2) conveyance facility; or (3) new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta)—provide information in their UWMP to demonstrate consistency with the Delta Plan policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code of Regulations, Title 23, Section 5003).

The Bakersfield District derives its water supply from a combination of groundwater, untreated local surface water purchased from the City of Bakersfield, and treated local surface and imported water purchased from Kern County Water Agency (KCWA) Improvement District 4 (ID-4). KCWA is a contractor of the State Water Project (SWP) and imports water for Municipal and Industrial use in the urbanized area through the California Aqueduct. Appendix C of the draft KCWA ID-4 UWMP demonstrates KCWA ID-4's consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance.[5] ID-4's service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies and regional and local demand management measures. Additional details on the

[4] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans

[5] KCWA ID-4, 2021. Draft Improvement District NO.4 Urban Water Management Plan 2020, dated May 2021.

demonstration of consistency with the Delta Plan is provided in ID-4 2020 UWMP and Section 6.10.2 of the plan.

1.6 Lay Description

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This Urban Water Management Plan (UWMP or Plan) is prepared for the California Water Service Company (Cal Water) Bakersfield District (also referred to as the "District"), which serves drinking water to a population of approximately 286,300. This UWMP serves as a foundational planning document and includes descriptions of historical and projected water demands, and water supplies, and the resulting reliability during a set of defined water supply conditions over a 20-year planning horizon. This document also describes the actions the District is taking to promote water conservation, both by the District itself and by its customers (referred to as "demand management measures"), and includes a plan to address potential water supply shortages such as drought or other impacts to supply availability (the "Water Shortage Contingency Plan"). This UWMP is updated every five years in accordance with state requirements under the Urban Water Management Planning Act and amendments (Division 6 Part 2.6 of the California Water Code [CWC] §10610 – 10656). Past plans developed for the District are available on the California Department of Water Resources (DWR) Water Use Efficiency Data Portal website: https://wuedata.water.ca.gov/. This document includes 10 chapters, which are summarized below.

Chapter 1- Introduction and Overview

This chapter presents the background and purpose of the UWMP, identifies the Plan organization, and provides this lay description overview of the document. For districts that rely on water from the Sacramento-San Joaquin Delta, this section also discusses and demonstrates consistency with the Delta Plan. One of the supply sources for the Bakersfield District is treated local surface and imported water purchased from Kern County Water Agency (KCWA) Improvement District 4 (ID-4). KCWA is a contractor of the State Water Project (SWP) and imports water for Municipal and Industrial use in the urbanized area through the California Aqueduct. Appendix C of the draft KCWA ID-4 UWMP demonstrates KCWA ID-4's consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance. Additional details on the demonstration of consistency with the Delta Plan is provided in the draft KCWA ID-4 UWMP and Section 6.10.2 of the Plan.

Chapter 2 - Plan Preparation

This chapter discusses key structural aspects related to the preparation of the UWMP, and describes the coordination and outreach conducted as part of the preparation of the Plan, including coordination with local agencies and other community organizations (i.e., City of Bakersfield and Kern County), relevant Groundwater Sustainability Agencies (GSAs), and the public.

Chapter 3 - System Description

This chapter provides a description of the Bakersfield District's water system and the service area, including information related to the climate, population, and demographics. The Bakersfield District operates two public water systems (PWS): Bakersfield PWS and North Garden PWS. The two PWSs are located in Kern County. The Bakersfield District has a population of approximately 286,300 and has a moderate climate characterized by hot dry summers and mild winters. The majority of the 7 inches of average annual precipitation falls between October and May. The service area includes mostly low-density residential, general commercial, and industrial land uses. All water customers are considered urban (i.e., non-agricultural water users).

Chapter 4 - Water Use Characterization

This chapter provides a description and quantifies the Bakersfield District's current and projected demands through the year 2045. The District provides drinking water (also referred to as "potable water") to customers. Water demands refer not only to the water used by customers, but also includes the water used as part of the system's maintenance and operation, as well as unavoidable losses inherent in the operation of a water distribution system. Water demand within the District was 58,572 acre-feet per year (AFY) on average between 2016 and 2020. Taking into account historical water use, expected population increase and other growth, climatic variability, and other assumptions, water demand within the District is projected to increase to 70,314 AFY by 2045, a change of 20 percent compared to the 2016-2020 average. In dry year periods, water demands are expected to be somewhat higher, potentially up to 72,382 AFY by 2045 during an extended five-year drought.

Chapter 5 - SB X7-7 Baseline and Targets

In this chapter, the Bakersfield District demonstrates compliance with its per capita water use target for the year 2020. The Water Conservation Act of 2009 (Senate Bill X7-7) was enacted in November 2009 and requires the state of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. In order to achieve this, each urban retail water supplier was required to establish water use targets for 2015 and 2020 using methodologies established by DWR. The Bakersfield District is in compliance with its 2020 water use target of 235 gallons per capita per day (GPCD), having reduced its water use in 2020 to 185 GPCD. The

Bakersfield District is also a member of a "Regional Alliance" for purposes of SB X7-7 compliance. The Regional Alliance's 2020 water use is 182 GPCD, which is in compliance with and below its 2020 target of 222 GPCD.

Chapter 6 - Water Supply Characterization

This chapter presents an analysis of the Bakersfield District's water supplies, as well as an estimate of water-related energy-consumption. The intent of this chapter is to present a comprehensive overview of the District's water supplies, estimate the volume of available supplies over the UWMP planning horizon, and assess the sufficiency of the District's supplies to meet projected demands under "normal" hydrologic conditions.

The source of water supply for the Bakersfield District is a combination of groundwater, untreated local surface water purchased from City of Bakersfield, and treated local surface and imported water purchased from Kern County Water Agency (KCWA) Improvement District 4 (ID-4). There are no new sources of supply currently planned.

The Bakersfield District pumps groundwater from the Kern County Subbasin (DWR Basin No. 5-022.14) of the San Joaquin Valley Basin. The Kern County Subbasin is not adjudicated, however, the Kern County Subbasin has been prioritized by DWR as "high", and is considered by DWR to be critically overdrafted. The Groundwater Sustainability Agencies (GSAs) which collectively represent the Kern County Subbasin completed five Groundwater Sustainability Plans (GSPs) in January 2020 per the Sustainable Groundwater Management Act (SGMA).

The District also purchases untreated Kern River surface water from City of Bakersfield, and treated Kern River or State Water Project (SWP) water from Kern County Water Agency (KCWA) Improvement District 4 (ID-4). Based on all available information, the combination of groundwater and purchased imported water supplies is expected to be sufficient to support the Bakersfield District's projected water demand through 2045.

Calculating and reporting of water system energy intensity is a new requirement for the 2020 UWMPs. Energy intensity is defined as the net energy used for water treatment, pumping, conveyance, and distribution for all water entering the distribution system, and does not include the energy used to treat wastewater. The energy intensity for the Bakersfield District is estimated to be 533 kilowatt hours per acre-foot of water (kWh/AF).

Chapter 7 - Water Supply Reliability Assessment

This chapter assesses the reliability of the Bakersfield District's water supplies, with a specific focus on potential constraints such as groundwater and surface water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of the District's supply (such as drought conditions) to support the

District's planning efforts to ensure that its customers are well served. Water service reliability is assessed during normal, single dry-year, and multiple dry-year hydrologic conditions. Based on this analysis, the Bakersfield District expects the available supplies to be sufficient to meet projected demands in all hydrologic conditions, including a five-year drought period, and considering the impacts of climate change.

Further, potential water quality issues are not expected to affect the quality of water served to the District's customers, as water quality is routinely monitored and the District is able to make all appropriate adjustments to its treatment and distribution system to ensure only high quality drinking water is served.

Chapter 8 - Water Shortage Contingency Planning

This chapter describes the Water Shortage Contingency Plan (WSCP) for the Bakersfield District. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. For example, implementing customer water budgets and surcharges, or restricting landscape irrigation to specific days and/or times. Consistent with DWR requirements, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage.

Chapter 9 - Demand Management Measures

This chapter includes descriptions of past and planned conservation programs that Cal Water operates within each demand management measure (DMM) category outlined in the UWMP Act, specifically: (1) water waste prevention ordinances, (2) metering, (3) conservation pricing, (4) public education and outreach, (5) distribution system water loss management, (6) water conservation program coordination and staffing support, and (7) "other" DMMs. Cal Water has developed a suite of conservation programs and policies, which address each DMM category.

Chapter 10 - Plan Adoption, Submittal, and Implementation

This chapter provides information on a public hearing, the adoption process for the UWMP and WSCP, the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP and WSCP. Prior to adopting the Plan, Cal Water held a formal public hearing to present information on its Bakersfield District UWMP and WSCP on June 1, 2021, 7:00 PM. This UWMP and the corresponding WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline.

Chapter 2
Plan Preparation

This chapter discusses the type of Urban Water Management Plan (UWMP or Plan) the Bakersfield District (also referred to herein as the "District") has prepared and includes information that will apply throughout the Plan. Coordination and outreach during the development of the Plan is also discussed. Specifically, this chapter includes the following sections:

2.1 Public Water Systems

2.2 Regional Planning

2.3 Individual or Regional Planning and Compliance

2.4 Plan Preparation, Standard Units, and Basis for Reporting

2.5 Coordination and Outreach

2.1 Public Water Systems

The Bakersfield District operates the two Public Water Systems (PWS) listed in Table 2-1 (i.e., Bakersfield PWS and North Garden PWS). Public Water Systems are the systems that provide drinking water for human consumption and are regulated by the State Water Resources Control Board (SWRCB), Division of Drinking Water. The SWRCB requires that water agencies report water usage and other relevant PWS information via the electronic Annual Reports to the Drinking Water Program (eARDWP). These data are used by the state to determine, among other things, whether an urban retail water supplier has reached the threshold (3,000 or more connections or 3,000 acre-feet of water supplied) for submitting an UWMP.

Table 2-1. Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA1510003	Bakersfield	65,301	53,248
CA1510055	North Garden	6,849	6,171
	TOTAL	72,150	59,418
NOTES: (a) Volumes are in units of AF.			

2.2 Regional Planning

Regional planning can deliver mutually beneficial solutions to all agencies involved by reducing costs for the individual agency, assessing water resources at the appropriate geographic scale, and allowing for solutions that cross jurisdictional boundaries. California Water Service Company (Cal Water) participates in regional water resources planning initiatives throughout California in the regions in which its 25 water districts are located. Cal Water participated in the 2020 Update of the Kern Integrated Regional Water Management Plan (IRWMP), which covers the Bakersfield District. Cal Water is also participating in the development of the Groundwater Sustainability Plans (GSPs) for the underlying groundwater subbasin.

2.3 Individual or Regional Planning and Compliance (Regional Alliance)

Urban water suppliers may elect to prepare individual or regional UWMPs. The Bakersfield District has elected to prepare an individual UWMP covering its two PWSs (see Table 2-2).

Urban retail water suppliers may report on the requirements of SB X7-7 (2009 California Conservation Act) individually or as a member of a "Regional Alliance." As described in Chapter 5, the Bakersfield District is a member of a Regional Alliance and this UWMP provides information on the District's compliance with its SB X7-7 water conservation targets both as an individual urban retail water supplier and as a member of a Regional Alliance.

Table 2-2. Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable*
X	Individual UWMP		
		Water Supplier is also a member of a RUWMP	
	X	Water Supplier is also a member of a Regional Alliance	California Water Service - Tulare Lake Alliance
	Regional Urban Water Management Plan (RUWMP)		
NOTES: The Bakersfield District is a member of a Regional Alliance. Chapter 5 provides information on the District's progress towards meeting its water conservation targets under SB X7-7 both as an individual urban retail water supplier and as a member of its Regional Alliance.			

2.4 Plan Preparation, Standard Units, and Basis for Reporting

☑ ***CWC § 10608.12 (t)***

"Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

☑ ***CWC § 10617***

"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

☑ ***CWC § 10621 (a)***

Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

☑ ***CWC § 10621 (f)***

Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

Per California Water Code (CWC) §10617, the Bakersfield District is an urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. It is therefore obligated under CWC §10621(f) to develop and submit an UWMP to the California Department of Water Resources (DWR) by July 1, 2021. The Bakersfield District is an urban retail water supplier, as identified in Table 2-3. The Bakersfield District is not a wholesale water supplier.

Annual volumes of water reported in this UWMP are measured in acre-feet (AF) and are reported on a calendar year basis (Table 2-3). Water use and planning data reported in this UWMP for calendar year 2020 cover the full twelve months of the year, as required by the UWMP Guidelines.

Table 2-3. Supplier Identification (DWR Table 2-3)

Type of Supplier	
	Supplier is a wholesaler
X	Supplier is a retailer
Fiscal or Calendar Year	
X	UWMP Tables are in calendar years
	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP	
Unit	AF
NOTES:	

2.5 Coordination and Outreach

☑ ***CWC § 10620 (d) (3)***

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. …

Coordination with other water suppliers, cities, counties, and other community organizations in the region is an important part of preparing a UWMP and Water Shortage Contingency Plan

(WSCP). This section identifies the agencies and organizations Bakersfield District sought to coordinate with during preparation of this Plan.

2.5.1 Wholesale and Retail Coordination

☑ ***CWC § 10631 (h)***

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

Urban retail water suppliers relying on one or more wholesalers for water supply are required to provide these wholesalers with information regarding projected water supply and demand. As shown in Table 2-4, the Bakersfield District derives portions of its water supply from Kern County Water Agency and City of Bakersfield.

Table 2-4. Water Supplier Information Exchange (DWR Table 2-4)

The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
Kern County Water Agency Improvement District No 4
City of Bakersfield
NOTES:

2.5.2 Coordination with and Notice to Other Agencies and the Community

☑ ***CWC § 10620 (d) (3)***

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

The Bakersfield District coordinated with cities, counties, and other community organizations during preparation of this UWMP. Cal Water provided notice to these entities and the communities it serves 60 days prior to the public hearing it held on June 1, 2021, to present the draft of the UWMP, address questions, and receive comments. Cities and counties receiving the public hearing notification from Bakersfield District as required per CWC §10621 (b) are listed in Table 10-1 in Chapter 10 of this Plan.

Copies of correspondence with other agencies and public notices are provided in Appendix B and Appendix C, respectively.

2.5.3 Coordination with Land Use Authorities

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

Cal Water coordinated with the City of Bakersfield and Kern County staff to review and confirm that appropriate land use assumptions were used to develop the UWMP demand projections. Correspondence with land use authorities is included in Appendix B.

Chapter 3
System Description

☑ ***CWC § 10631 (a)***

A plan shall be adopted in accordance with this chapter that shall do all of the following:

Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

This chapter provides a description of the Bakersfield District (also referred to herein as the "District") water system and service area, including climate, population, demographics, and land uses to help in understanding various elements of water supply and demand. This chapter includes the following sections:

3.1 General Description

3.2 Service Area Boundary Map

3.3 Service Area Climate

3.4 Service Area Population and Demographics

3.5 Land Uses within Service Area

3.1 General Description

The District has served parts of the City of Bakersfield and surrounding areas since 1926, when California Water Service Company (Cal Water), an investor-owned water utility regulated by the California Public Utilities Commission (CPUC), purchased the Bakersfield Water Works. The District is comprised of two public water systems (PWS): the Bakersfield PWS and the North Garden PWS. The water system to the west of the District is owned by the City of Bakersfield but operated under contract by Cal Water. The Oildale Mutual Water Company and North of the River Municipal Water District serve Oildale and unincorporated lands to the north of the District. East Niles Community Services District provides service to the region east of the District.

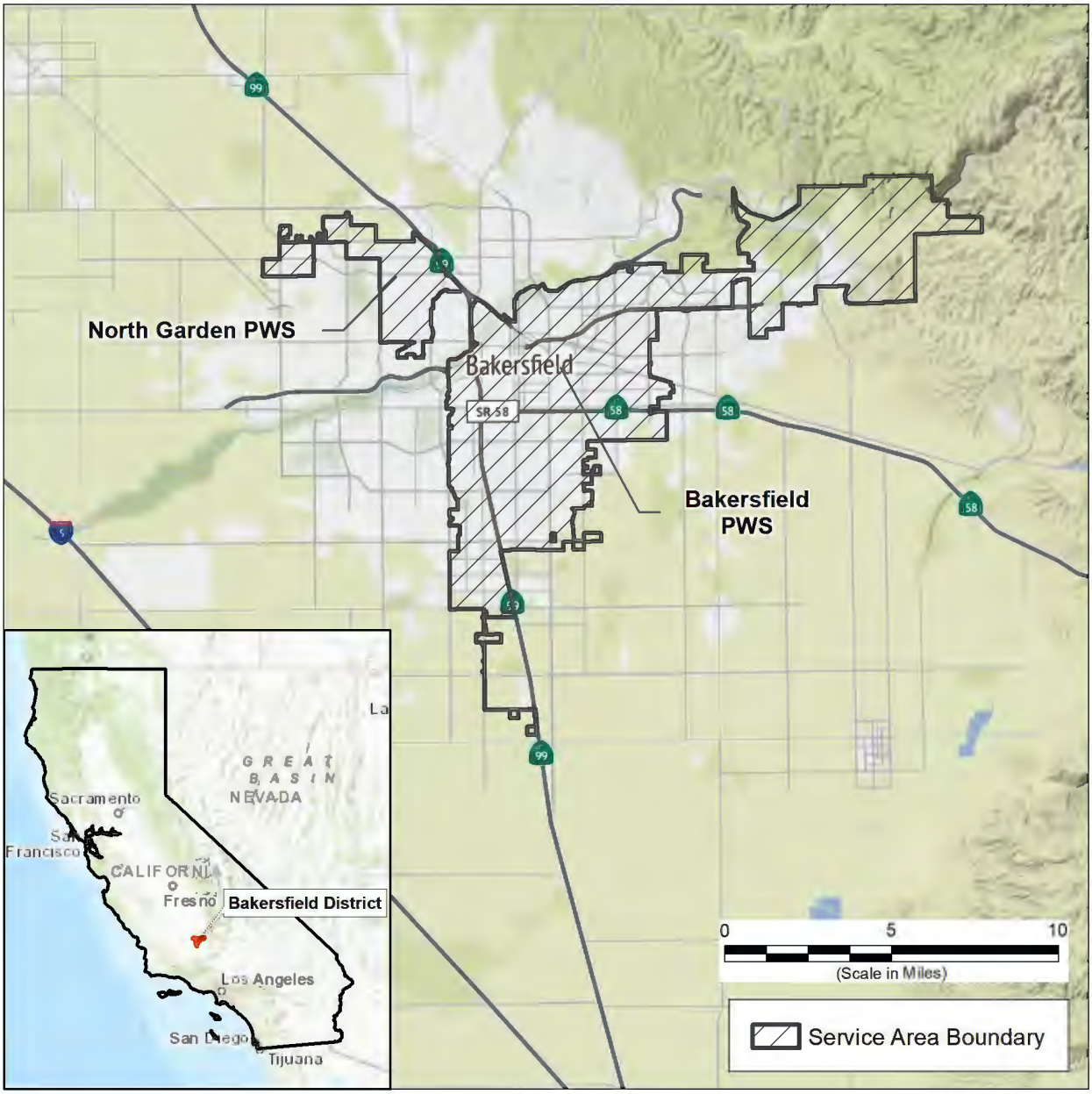
The District currently produces roughly 53 million gallons of water daily from local groundwater, surface water from the Kern River, and State Water Project water purchased from the Kern County Water Agency. The District delivers water to residential, commercial, industrial, and governmental customers. Residential customers account for most of the District's service connections and 65 percent of its water use. Non-residential water uses account for 25 percent of total demand, while distribution system losses account for 10 percent.

3.2 Service Area Boundary Map

Figure 3-1 shows the location of the District and its current service area boundaries. The District is located in Kern County and serves portions of the City of Bakersfield and segments of unincorporated Kern County lands adjacent to the City of Bakersfield. Bakersfield is the largest city in Kern County. Major transportation links in the District include the Golden State Highway (State Route 99), and Stockdale Highway (State Route 58). The Westside Freeway (Interstate 5) is approximately 15 miles to the southwest of the District at its closest point. The Southern Pacific Railroad and the Burlington Northern Santa Fe Railroad provide rail service to the region.

The District is situated in the Tulare Lake Hydrologic Region, within the Kern Valley Floor Rivers sub-area. The service area is built upon the alluvium of the Kern River flood plain and covers approximately 51 square miles.

Figure 3-1. District Location and Service Boundaries



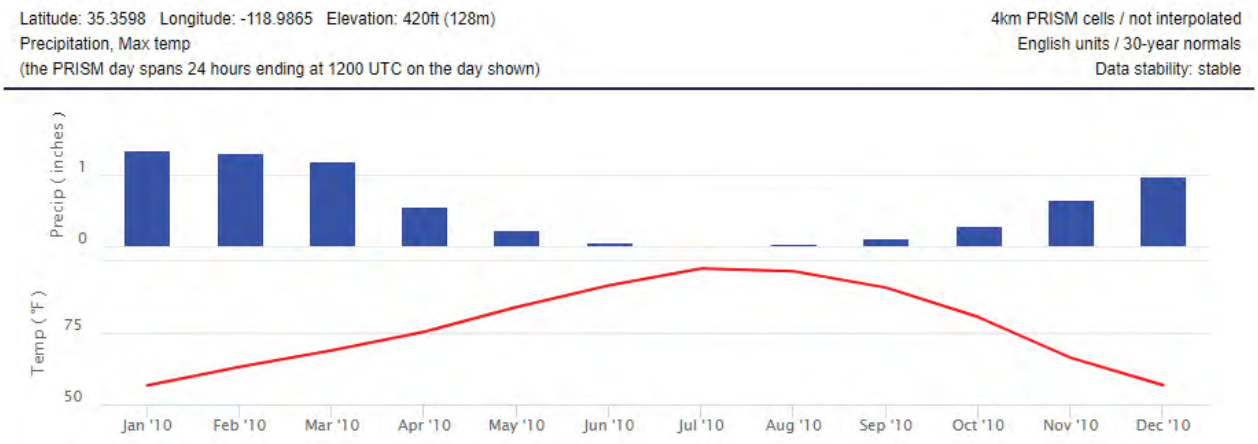
3.3 Service Area Climate

The District's climate is characterized by hot dry summers and mild winters (see Figure 3-2).[6] Most rainfall occurs between October and May. Precipitation totals in the summer months are

[6] Precipitation and temperature data downloaded from: https://prism.oregonstate.edu/explorer/. These data represent a 30-year period from 1980 through 2010. The x-axis reflects the end of the 30-year time series.

negligible. On average, the District receives 7 inches of rainfall annually. Maximum daily air temperature averages 94 degrees Fahrenheit during the summer months. In the winter, it averages 59 degrees Fahrenheit.

Figure 3-2. 30-Year Normals, Precipitation and Maximum Daily Air Temperature



Based on a review of data downloaded from the Oregon State PRISM dataset for 1895 to 2019, rainfall varies significantly from year-to-year, as it does in most of California.[7] The standard deviation in annual rainfall is 2.3 inches, or about one-third of the average annual rainfall.[8] Consecutive years of below average rainfall are fairly common. Since 1895, runs of below average rainfall lasting three or more years have occurred 11 times and runs lasting five or more years have occurred three times. The most recent run lasting five years was from 2011 through 2015. The years 2006 through 2009 also experienced below average rainfall. Thus, during the 10-year period 2006 to 2015, nine out of ten years had below average rainfall. While rainfall in the region is highly variable, there has been no statistically significant trend in the mean or variance of annual rainfall since 1895.

The District's climate has been warming. Since 1895, average daily temperature has increased at an average rate of 0.018 degrees Fahrenheit per year. Mean annual temperature for 2010-2019 was 2.8 degrees Fahrenheit higher than for 1900-1909.

3.4 Service Area Population and Demographics

It is estimated that the District's service area population was 286,310 in 2020.

[7] Downloaded from: https://prism.oregonstate.edu/explorer/. The x-axis reflects the end of the 30-year time series.
[8] Standard deviation measures the typical or average year-to-year variation in annual rainfall amount. Thus, it is typical for annual rainfall to fluctuate significantly in the District.

The District estimates its service area population using Census Block population counts from decadal Census data. The decadal Census estimates are converted to average population per single- and multi-family service, which are applied to service counts for years between the decadal Censuses. This method is similar to the approach used by the California Department of Water Resources (DWR) Population Tool and population estimates generated by the two methods have been shown to differ by less than a percent in most cases.[9]

Current and projected service area population are shown in Table 3-1. Projected population is based on population and employment forecasts for Kern County generated by the California Department of Transportation's (Caltrans) long-term socio-economic forecast model.[10] Between 2020 and 2045, service area population is projected to increase at an average rate of 0.9 percent per year.

Table 3-1. Population – Current and Projected (DWR Table 3-1)

Population Served	2020	2025	2030	2035	2040	2045
	286,310	299,366	314,753	329,207	342,878	356,039
NOTES:						

Demographics for the City of Bakersfield are summarized in Table 3-2. These data are from the U.S. Census American Community Survey 2019 5-Year Estimates.[11] Relative to the rest of California, the City of Bakersfield's population is younger while racial composition is similar. Educational attainment is lower than for the state as a whole, as is median household income.

The City of Bakersfield's stock of housing is significantly newer than for California overall. Forty-six percent of the homes in Bakersfield were built after 1990 compared to 25.5 percent for all of California. Homes built after 1990 are more likely to have plumbing fixtures and appliances that are compliant with state and federal water and energy efficiency standards.

[9] California Water Service, 2016. 2015 Urban Water Management Plan: Bakersfield District, dated June 2016.
[10] California Department of Transportation's long-term socio-economic forecast model: https://dot.ca.gov/programs/transportation-planning/economics-data-management/transportation-economics/long-term-socio-economic-forecasts-by-county
[11] U.S. Census Bureau, 2019. 2015-2019 American Community Survey 5-year Estimates, dated 2019. Retrieved from: https://data.census.gov/cedsci/.

Table 3-2. Demographic and Housing Characteristics

Demographics	City of Bakersfield	California
Median Age (years)	30.8	36.5
Racial Makeup (%)		
White	70.7	63.8
Black or African American	8.7	7.0
American Indian and Alaska Native	1.6	1.9
Asian	8.8	16.7
Native Hawaiian	0.5	0.8
Some other race	13.7	15.1
Hispanic or Latino (of any race) (%)	52.2	39.0
Educational Attainment (%)		
Bachelor's Degree or Higher	21.9	33.9
Primary Language Spoken at Home (%)		
English Only	86.1	82.2
Limited English-Speaking Households	6.4	8.9
Median Household Income ($)	63,139	75,235
Population below Federal Poverty Level (%)	17.4	13.4
Housing	**City of Bakersfield**	**California**
Median Year Built	1988	1975
Year Housing Built (%)		
2010 or Later	6.5	3.5
2000 to 2009	23.7	11.2
1990 to 1999	15.8	10.9
Before 1990	53.9	74.5

3.5 Land Uses within Service Area

The land use pattern for City of Bakersfield and surrounding areas is shown in Table 3-3. These data are taken from the Metropolitan Bakersfield General Plan Update Environmental Impact Report and reflect the land use pattern circa 2002.[12] Agriculture is the most prominent land use

[12] Accessed from: https://docs.bakersfieldcity.us/weblink/0/edoc/955915/Sec04-01.LandUse.pdf

within the General Plan's Planning Area, occupying 78,962 acres or 32 percent of land uses. Low Density Residential is the second most prominent land use, comprising 10 percent of land uses. Residential land uses of all types comprise 29 percent of land uses.

Per the General Plan, development on the periphery of urban Bakersfield will be focused on ten mixed use centers located in the southwest, northwest, and northeast. It is expected that the southwest centers would include a mix of professional office and retail uses, moderate density residential, and would filter out to lower suburban-type densities. The northwest centers will contain retail commercial, light industrial, and moderate and high density residential, and will be surrounded by low and estate residential densities. In addition to the primary development centers, peripheral development will be focused in smaller community centers, such as in the Greenfield and Lamont areas, with local-serving commercial services and residential uses.

The most intensive development has occurred and is expected to continue to occur in and around the southwest centers. This area is outside of the District's current service boundary (see Figure 3-1).

Some of the expected development associated with the northwest and northeast centers will occur within the District's current service boundary. As shown in Table 3-1, the District is projecting that service area population will increase by 24 percent over the next 25 years. The total number of active services is expected to increase from just over 72,000 in 2020 to more than 98,000 in 2045.

Table 3-3. Metropolitan Bakersfield General Plan Update Land Use

Description		Land Use Acres	Percentage
Residential			
RR	Rural Residential	9,175	3.75
ER	Estate Residential	5,148	2.11
UER	Urban Estate Residential	2,128	0.87
SR	Suburban Residential	11,170	4.57
SR/LR	County Jurisdiction	1,122	0.46
LR	Low Density Residential	24,830	10.16
LMR/LR	County Jurisdiction	2,491	1.02
LMR	Low Medium Density Residential	7,721	3.16
LR/PS	County Jurisdiction	42	0.02
HMR	High Medium Density Residential	5,285	2.16
HR	High Density Residential	1,578	0.65
		70,689	**28.92**
Commercial			
HC	Highway Commercial	526	0.22
GC	General Commercial	5,364	2.19
OC	Office Commercial	629	0.26
MC	Major Commercial	480	0.20
MUC	Mixed Use Major/Office Commercial	320	0.13
		7,318	**2.99**
Industrial			
LI	Light Industrial	3,285	1.34
SI	Service Industrial	9,686	3.96
HI	Heavy Industrial	3,457	1.41
		16,429	**6.72**
Public Facilities			
P	Public Facilities	8,842	3.62
PS	Public and Private Schools	1,902	0.78
PT	Public Transportation Corridor	1,495	0.61
P-SW	Public and Private Schools/Parks	335	0.14
		12,615	**5.14**
Open Space			
OS	Open Space	8,393	3.43
OS-P	Parks and Recreational Facilities	3,414	1.40
OS-S	Slopes Exceeding 30%	4,894	2.00
		16,701	**6.83**
Resource			
R-IA	Intensive Agriculture	78,962	32.31
R-EA	Extensive Agriculture	15,086	6.17
R-MP	Mineral Petroleum	24,157	9.88
		118,205	**48.36**
ST FED	State and Federal Lands	657	0.27
		657	**0.27**
Other	Canals/Private Streets	1,831	0.75
		1,831	**0.75**
TOTAL ACRES:		***244,405***	***100.00***

Source: Land Use Map Database, revised April 2, 2002.

Chapter 4
Water Use Characterization

☑ ***CWC § 10631 (d) (1)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

This chapter provides a description and quantifies the Bakersfield District's (also referred to herein as the "District") past, current, and projected water uses through 2045. For the purposes of the Urban Water Management Plan (UWMP or Plan), the terms "water use" and "water demand" are used interchangeably. This chapter is divided into the following subsections:

4.1 Non-Potable Versus Potable Water Use

4.2 Past, Current, and Projected Water Uses by Sector

4.3 Climate Change Considerations

Appendix D provides additional information and data related to the development of the water demand projections presented in this chapter.

4.1 Non-Potable Versus Potable Water Use

This Plan maintains a clear distinction between recycled, potable, and raw water uses and supplies. Recycled water is addressed comprehensively in Chapter 6, but a summary of recycled

water demand is included in Table 4-3 of this chapter. The primary focus of this chapter is the historical and projected potable water uses in the District.

4.2 Past, Current, and Projected Water Uses by Sector

☑ ***CWC § 10631 (d)***

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

4.2.1 Past and Current Water Use

Table 4-1 shows water use in 2016-2020 by use type (referred to as "sector" in CWC §10631). Water use has been decreasing in the District since the early-2000s. Several factors have contributed to this reduction. First, most of the District's residential customers were unmetered in 2000. The District has transitioned nearly all these customers to metered water service.[13] A study completed by San Jose State University found that after six months of metering, previously unmetered households in the District reduced their water use by an average of 17 percent.[14] Second, California Water Service Company (Cal Water) implemented conservation pricing starting in 2009, supplying stronger financial incentives to use water efficiently. Third, starting around 2012, Cal Water tripled the level of expenditure on conservation programs aimed at helping customers use water more efficiently. Fourth, appliance efficiency standards and plumbing codes have contributed to significant improvement over time in the average water use efficiency of the installed base of appliances and plumbing fixtures. For example, a new toilet

[13] The District will be fully metered by no later than 2025.
[14] Tanverakul, S. and J. Lee, 2015. Impacts of Metering on Residential Water Use in California, Journal AWWA 107:2, dated February 2015.

uses roughly one-third the amount of water as a toilet manufactured in the 1980s while a new clothes washer uses about half the amount of water as an older washer.[15] Per capita water use in 2020 was 31 percent below its 2008 peak.

Water use in 2020 was 59,418 acre-feet (AF). Residential customers account for most of the District's service connections and 65 percent of its water uses. Non-residential water uses account for 25 percent of total demand, while distribution system losses account for 10 percent.

Table 4-1. Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)

Use Type	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume (a)				
			2016	2017	2018	2019	2020
Single Family		Drinking Water	30,449	33,149	34,491	32,852	35,018
Multi-Family		Drinking Water	3,243	3,317	3,366	3,323	3,400
Commercial		Drinking Water	9,577	10,123	10,412	10,146	10,018
Institutional/Gov't		Drinking Water	4,597	5,380	5,412	4,785	4,976
Industrial		Drinking Water	38	46	39	40	42
Other Potable		Drinking Water	4,493	197	1,482	2,470	76
Landscape	(b)	Drinking Water	0	0	0	0	0
Losses	(c)	Drinking Water	2,775	6,360	4,572	2,909	5,890
		TOTAL	55,171	58,572	59,773	56,525	59,418

NOTES:
(a) Volumes are in units of AF.
(b) District's billing system does not track this use type separate from other use types.
(c) Real and apparent losses.

4.2.2 Projected Water Use

Projected water use through 2045 is summarized in Table 4-2. Future water use is estimated as a function of expected service growth and a forecast of average water use per service for each of the use types shown in the table. Projected population and services are based on population and employment forecasts for Kern County generated by the California Department of Transportation's (Caltrans) long-term socio-economic forecast model.[16] These projections are used to estimate the growth in services for each use type. Over the 25-year planning period

[15] Water Research Foundation, 2016. Residential End Uses of Water, Version 2, prepared by DeOreo, William B., Peter Mayer, Benedykt Dziegielewski, and Jack Kiefer, dated April 2016.
[16] California Department of Transportation's long-term socio-economic forecast model: https://dot.ca.gov/programs/transportation-planning/economics-data-management/transportation-economics/long-term-socio-economic-forecasts-by-county

(2020-2045), the total number of services is projected to increase at an average rate of 1.1 percent annually. For sake of comparison, between 2000 and 2020, the total number of services increased at an average rate of 1.2 percent annually. As described later in the chapter, average water use per service is adjusted over the forecast period to account for anticipated reductions in use due to the ongoing effects of appliance standards and plumbing codes, the District's conservation and customer assistance programs, and growth in the inflation-adjusted cost of water service and household income. These factors, in combination, are projected to attenuate the increase in water use associated with future service and population growth.

Table 4-2. Use for Potable and Non-Potable Water – Projected (DWR Table 4-2)

Use Type	Additional Description *(as needed)*	Projected Water Use (a)				
		2025	2030	2035	2040	2045
Single Family		35,756	37,777	39,779	41,601	43,423
Multi-Family		3,394	3,457	3,533	3,596	3,651
Commercial		10,209	10,358	10,567	10,725	10,890
Institutional/Gov't		5,122	5,249	5,382	5,508	5,622
Industrial		43	44	44	45	46
Other Potable		171	171	171	171	171
Landscape	(b)	0	0	0	0	0
Losses	(c)	5,745	5,625	5,931	6,226	6,511
TOTAL		60,439	62,681	65,408	67,871	70,314

NOTES:
(a) Volumes are in units of AF.
(b) District's billing system does not track this use type separate from other use types.
(c) Real and apparent losses.

Future water demands are expected to be comprised only of potable water use, as shown in Table 4-3. As discussed in Chapter 6, recycled water from the City of Bakersfield's wastewater treatment facilities is used for agricultural irrigation. None of the recycled water generated by the City of Bakersfield's wastewater treatment facilities is expected to be used to meet the future water demands of District customers.

Table 4-3. Total Gross Water Use (Potable and Non-Potable) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable Water, Raw, Other Non-potable *From DWR Tables 4-1 and 4-2*	59,418	60,439	62,681	65,408	67,871	70,314
Recycled Water Demand *From DWR Table 6-4*	0	0	0	0	0	0
Optional Deduction of Recycled Water Put Into Long-Term Storage						
TOTAL WATER USE	59,418	60,439	62,681	65,408	67,871	70,314
NOTES: (a) Volumes are in units of AF.						

4.2.3 Distribution System Water Loss

☑ ***CWC § 10631 (3)***

(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

Table 4-4 shows distribution system water losses for the previous five years. Water loss is the sum of apparent and real losses. Apparent loss is associated with metering inaccuracies, billing and administrative errors, authorized unmetered uses (e.g., system flushing and firefighting), and unauthorized uses. Real loss is associated with physical water lost through line breaks, leaks and seeps, and overflows of storage tanks. Since 2016, urban retail water suppliers have been required under CWC §10608.34 and California Code of Regulations (CCR) §638.1 et seq to quantify distribution system water losses using the American Water Works Association (AWWA) Free Water Audit Software (referred to as "water loss audit reports"). The water loss audit reports the District submits to DWR provide the basis for the 2016-2019 estimates shown in Table 4-4 and are available through DWR's Water Use Efficiency Data Portal.[17] The District's 2020 water loss audit report had not been completed at the time this Plan was prepared.[18] The 2020

[17] DWR's Water Use Efficiency Data Portal: https://wuedata.water.ca.gov/awwa_plans
[18] The District's regulatory deadline for filing its 2020 water loss audit report to the state is October 1, 2021.

estimate shown in Table 4-4 is therefore drawn from the District's preliminary draft water loss audit results.

Table 4-4. Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)

Reporting Period Start Date	Volume of Water Loss (a)
01/2016	2,775
01/2017	6,360
01/2018	4,572
01/2019	2,909
01/2020	5,890
NOTES: (a) Volumes are in units of AF.	

CWC §10631 (3)(c) requires that this UWMP demonstrate whether the distribution loss standards enacted by the State Water resources Control Board (SWRCB) pursuant to §10608.34 have been met. However, the SWRCB has yet to establish these standards, and thus consistency with these standards cannot be demonstrated herein.

4.2.4 Future Water Savings in Projected Water Use

☑ ***CWC § 10631 (d) (4)***

(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

As affirmed in Table 4-5, both future water savings (discussed below) and lower income residential demands (discussed in 4.2.5) are included in the projections of future water use.

Table 4-5. Inclusion in Water Use Projections (DWR Table 4-5)

Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Section 4.2.4
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

As noted above, the District has adjusted the forecast of average water use per service for the effects of appliance standards and plumbing codes, conservation programs, and increases in the real cost of water service and household income. These adjustments are described below.

The District uses forecasts of per capita water savings from appliance standards and plumbing codes prepared for DWR to adjust its projections of average water use per service.[19] These forecasts incorporate the effects of the following codes and regulations:

- Assembly Bill (AB) 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014 cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not consume more than 0.125 gallons per flush, 75 percent less than the standard set by AB 715.
- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. Water use efficiency is summarized by the water factor for the appliance which measures the gallons of water used per cycle per cubic foot of capacity. A typical top-loading residential clothes washer manufactured in the 1990s had a water factor of around 12. In 2015, the allowable water factor for top- and front-loading residential clothes was reduced to 8.4 and 4.7, respectively. In 2018, water factor standard for top-loading residential clothes washers will be reduced to 6.5. In 2010 the allowable water factor for top- and front-loading commercial clothes washers was reduced to 8.5 and 5.5, respectively. The maximum water factor for Energy Star compliant top- and front-loading washers is 3.7 and 4.3, respectively. The U.S. Environmental Protection Agency estimates that Energy Star washers made up at least 60 percent of the residential market and 30 percent of the

[19] M.Cubed, 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD, technical memorandum prepared for the California Department of Water Resources, dated August 2016.

commercial market in 2011.[20] An Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. Federal dishwasher water use efficiency standards were last updated in 2013. The maximum water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.

- New construction and renovations in California are now subject to CalGreen Code requirements. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20 percent reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.
- Senate Bill (SB) 407, enacted in 2009, mandates that all buildings in California come up to current State plumbing fixture standards within this decade. This law establishes requirements that residential and commercial property built and available for use on or before January 1, 1994 replace plumbing fixtures that are not water conserving, defined as "noncompliant plumbing fixtures." This law also requires effective January 1, 2017 that a seller or transferor of single-family residential property show to the purchaser or transferee, in writing, the specified requirements for replacing plumbing fixtures and whether the real property includes noncompliant plumbing. Similar disclosure requirements went into effect for multi-family and commercial transactions January 1, 2019. SB 837, passed in 2011, reinforces the disclosure requirement by amending the statutorily required transfer disclosure statement to include disclosure about whether the property follows SB 407 requirements.

The District's 2015 Conservation Master Plan forms the basis for the forecast of water savings from conservation programs. Cal Water used the Alliance for Water Efficiency's Water Conservation Tracking Tool to estimate expected water savings from planned program implementation.[21]

Projected increases in water service costs and household income form the basis for the adjustments to average water use due to changes in the real cost of water service. The forecast uses the historical rate of increase in District water rates to project future water service costs. It uses Caltrans income projections for Kern County to estimate changes in household income. It uses empirically derived estimates of price and income demand elasticity to adjust future water demand for changes in these variables.[22]

[20] EPA Energy Star Unit Shipment and Market Penetration Report Calendar Year 2011 Summary.
[21] Alliance for Water Efficiency Water Conservation Tracking Tool: https://www.allianceforwaterefficiency.org/resources/topic/water-conservation-tracking-tool
[22] M.Cubed, 2018. California Water Service 2020 Test Year Sales Forecast: 2018 General Rate Case, prepared for California Water Service by M.Cubed, dated January 2018.

Table 4-6 shows the total water savings from plumbing codes and appliance standards, conservation programs, and increases in the real cost of water service.

Table 4-6. Future Conservation Savings (AF)

2025	2030	2035	2040	2045
1,724	3,319	4,062	4,889	5,648

4.2.5 Water Use by Lower Income Households in Water Use Projections

☑ ***CWC § 10631.1***

(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirements under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

California Senate Bill No. 1087 (SB 1087), Chapter 727, passed in 2005, amended Government Code §65589.7 and CWC §10631.1. This law requires that local governments supply a copy of their adopted housing element to water and sewer providers. Additionally, it requires that water providers grant priority for service allocations to developments that include housing units for lower income families and workers. The UWMP Act requires that water providers estimate water demands by lower income single and multi-family households.

Cal Water must serve all development that occurs within its service area, regardless of the income level of the future residents. Cal Water does not keep records of the income level of its customers and does not discriminate when supplying water to any development. It is the responsibility of the city or county with land use authority over a given area to approve or not approve developments within Cal Water's service areas. Cal Water has a Customer Assistance Program (CAP) to help with water service affordability. CAP discounts the monthly service charge of qualifying lower income households.

Table 4-7 shows projected water use by lower income households. These demands are part of the projected residential water use in Table 4-2. Cal Water used the City of Bakersfield's General

Plan Housing Element to estimate the number of lower income households which is the basis for the estimates in Table 4-7.[23]

Table 4-7. Residential Demands of Lower Income Households (AF)

2025	2030	2035	2040	2045
12,528	13,195	13,860	14,463	15,064

4.2.6 Characteristic Five-Year Water Use

☑ ***CWC § 10635(b)(3)***

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following…

(3) A comparison of the total water supply sources available to the water supplier with ***the total projected water use for the drought period.*** (Emphasis added).

CWC §10635(b) is a new requirement for 2020 UWMPs. A critical part of this new statutory language is the requirement to prepare a five-year Drought Risk Assessment (see Section 7.5). As a first step, DWR suggests that water suppliers estimate their unconstrained water demand for the next five years (2021-2025). Unconstrained water demand is water use in the absence of drought water use restrictions. Drought conditions cause unconstrained demands to increase. The Drought Risk Assessment presented in Section 7.5 accounts for this increase in unconstrained water demand. Cal Water's demand forecast model separately estimates water use for normal, wet, and dry weather conditions. Table 4-8 shows unconstrained demands for 2021-2025 for normal weather and multiple-dry-year scenarios.

Table 4-8. Characteristic Five-Year Water Use (AF)

Weather Scenario	2021	2022	2023	2024	2025
Multi-Year Dry	60,965	61,217	61,503	61,809	62,188
Normal	59,253	59,497	59,774	60,071	60,439
NOTES: The table shows unconstrained demand (i.e., demand in the absence of drought water use restrictions).					

[23] City of Bakersfield Housing Element 2015-2023, Table 18. Accessed from https://docs.bakersfieldcity.us/weblink/0/edoc/1273910/Bakersfield%20Housing%20Element%20(2015-2023).pdf

4.3 Climate Change Considerations

☑ ***CWC § 10635(b)***

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

Climate strongly influences the level and seasonal pattern of District water demands. Cal Water has analyzed the effect of climate and weather variability on both aspects of demand.[24] Using this information, Cal Water has estimated the effect of alternative climate warming scenarios on future water demand.[25] Table 4-9 summarizes the results of this analysis. It shows that for plausible emission scenarios and corresponding temperature increases, climate change may, on average, increase future District demands by 2 to 3 percent compared to current climate conditions. Two points are worth noting. First, this is the average effect. There is significant variation about the mean. Second, this is a ceteris paribus, or all else equal, result. It assumes existing levels and types of landscaping. However, landscaping choices are partly a function of climate and as the climate changes, so too may these choices. It is reasonable to think households and businesses will adapt their landscaping as the climate warms. This adaptation may mitigate some of the expected demand increase shown in the table.

[24] A&N Technical Services, 2014. Cal Water Long-Term Water Demand Forecast Model. Report prepared for California Water Service Company. December 2014.

[25] Table 4-9 uses climate scenarios for the southwestern United States. These in turn rely on alternative greenhouse gas emission scenarios. Emissions under scenario A2 are higher than under scenario B2. The 80th percentile scenario is the 80th percentile temperature change for the full suite of emission scenarios. For further information, see Kunkel, K.E, L.E. Stevens, S.E. Stevens, L. Sun, E. Janssen, D. Wuebbles, K.T. Redmond, and J.G. Dobson, 2013. Regional Climate Trends and Scenarios for the U.S. National Climate Assessment. Part 5. Climate of the Southwest U.S., NOAA Technical Report NESDIS 142-5, dated 2013.

Table 4-9. Climate Change Effect on Demand

Emissions Scenario	Change in Mean Temperature by 2040 (degree F)	Change from Current Mean Temperature (%)	Effect on Demand (%)
Lower Emissions Scenario (B1)	2.5	3.4%	2.0%
Higher Emissions Scenario (A2)	2.7	3.7%	2.1%
80%ile Temperature Scenario	3.6	4.9%	2.8%

NOTES:

(a) Predicted temperature increases for Southwest United States for alternative emission scenarios reported in Kunkel et al. (2013). Predicted effect on demand derived from weather response models estimated with historical monthly water use, temperature, and rainfall data.

(b) The physical climate framework for the 2013 National Climate Assessment is based on climate model simulations of the future using the high (A2) and low (B1) SRES emissions scenarios. The A1B emission scenario reflects a middle case between the A2 and B1 scenarios. The 80%ile scenario is the 80th percentile temperature change across the family of emissions scenarios. Further description of emission scenarios can be found at https://www.ipcc.ch/site/assets/uploads/2018/03/sres-en.pdf

Chapter 5
SB X7-7 Baseline and Targets

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.28***

(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

The Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, requires that urban retail water suppliers reduce their per capita water use by 20 percent by 2020. SB X7-7 defines an urban retail water supplier as "a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes" (CWC §10608.12). The Bakersfield District meets both criteria. The state will assess each urban retail water supplier's 2020 per capita water use against the target it established in its 2015 urban water management plan (UWMP).

This chapter demonstrates the District's compliance with its SB X7-7 per capita water use target and includes the following sections:

5.1 Wholesale Suppliers

5.2 Updates to the 2015 UWMP Calculations

5.3 Service Area Population

5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target

5.5 Demonstration of Compliance with SB X7-7 2020 Target

5.6 Demonstration of Compliance with Regional Alliance 2020 Target

5.1 Wholesale Suppliers

SB X7-7 does not directly apply to wholesale water suppliers. Wholesale suppliers may adopt programs and policies that support SB X7-7 compliance by the retail water suppliers they serve. They may also take part in a Regional Alliance (discussed below) set up to satisfy SB X7-7 requirements on a regional basis. As discussed in Chapter 2, the District is not a wholesale water supplier and does not receive water supply from any wholesale water supplier. This section therefore does not apply.

5.2 Updates to the 2015 UWMP Calculations

The District has updated its baseline GPCD, 2015 interim GPCD target, 2015 actual GPCD, and 2020 GPCD target. These updates were necessary because the District discovered in late 2020 that production from its treated surface water supply source was reported incorrectly in its 2010 and 2015 UWMPs. Per the *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*, treated surface water should be measured at the point of entry into the distribution system.[26] The District had been reporting production for this water source at the point of diversion from the Kern River and thus was including the volume of water lost during transmission to the treatment plant and during the treatment process in the calculation of per capita water use. This resulted in an overstatement of baseline and compliance per capita water use.

The District has updated the calculations of its baseline GPCD, 2015 interim GPCD target, 2015 actual GPCD, and 2020 GPCD target using the corrected production data. None of the other data used in the 2010 and 2015 UWMPs to establish the District's baseline GPCD and GPCD targets has been altered. Specifically, the service area population and groundwater production estimates used in the previous UWMPs are unchanged.

The updated SBX7-7 Verification Forms establishing the District's 2020 GPCD target are provided in Appendix E.

[26] California Department of Water Resources (2016). Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use, page 16 and Figure 1.

5.3 Service Area Population

Service area population estimation must satisfy the requirements in Methodology 2 – Service Area Population – of DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*. California Water Service Company (Cal Water)'s population estimation method is similar to the method used by DWR's Population Tool.[27] DWR reviewed and accepted Cal Water's population estimation method as part of the review of its 2015 UWMPs. Cal Water used this method to estimate the District's 2020 service area population. As reported in Chapter 3, the District's population was 286,310 in 2020.

5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target

Table 5-1 shows the District's 5- and 10-year baseline periods, baseline per capita water use (GPCD), and SB X7-7 2020 target.[28]

Table 5-1. Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target GPCD
10-15 year	1995	2004	294	235
5 Year	2003	2007	287	
NOTES:				

5.5 Demonstration of Compliance with SB X7-7 2020 Target

Service area population and water use in 2020 were 12,283 and 2,012 AF, respectively, resulting in per capita water use of 146 GPCD. This is less than target GPCD, as shown in Table 5-2.

[27] Cal Water estimates service area population using census block population data with the LandView 5 and MARPLOT software programs. In census years, the method estimates service area population using the population counts of census blocks with centroids falling within the District's service boundary. In off-census years, the method estimates population by adjusting the census year estimates for changes in the number of single- and multi-family service connections and dwelling units. As shown in the District's 2015 UWMP, estimates prepared using this method and DWR's Population Tool typically differ by less than a percent. Cal Water prefers using its method to be consistent with its other planning documents.

[28] The population and water use data used to establish the District's 2020 target GPCD are provided Appendix F.

Table 5-2. SB X7-7 2020 Compliance (DWR Table 5-2)

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD *(Adjusted if applicable)*		
185			235	Yes
NOTES:				

5.6 Demonstration of Compliance with Regional Alliance 2020 Target

An urban retail water supplier can satisfy SB X7-7 requirements either individually or as part of a Regional Alliance. The District formed a regional alliance with other Cal Water districts in the Tulare Lake Hydrologic Region. The name of this Regional Alliance is California Water Service – Tulare Lake Regional Alliance. Table 5-3 shows 2020 per capita water use for this Regional Alliance. Table 5-4 demonstrates compliance with the Regional Alliance's SB X7-7 2020 target GPCD.[29]

Table 5-3. SB X7-7 Regional Alliance – 2020 GPCD (DWR RA 2020 GPCD Table)

Participating Member Agency Name	2020 Actual GPCD*	2020 Population	(2020 GPCD) X (2020 Population)	Regional Alliance 2020 GPCD (Actual)
Cal Water Bakersfield District	185	286,310	53,045,181	
Cal Water Kern R. Valley District	126	5,501	693,126	
Cal Water Selma District	157	26,157	4,099,875	
Cal Water Visalia District	183	147,032	26,918,034	
Regional Alliance Totals	651	465,000	84,756,216	182

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6, Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

[29] The population and water use data used to establish the Regional Alliance's 2020 target GPCD are provided in Appendix F.

Table 5-4. SB X7-7 Regional Alliance – 2020 Compliance (DWR RA 2020 Compliance Table)

2020 Actual GPCD	Optional Adjustment for Economic Growth[1]	Adjusted 2020 Actual GPCD	2020 Target GPCD [2]	Did Alliance Achieve Targeted Reduction for 2020?
182			222	Yes

[1]Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods. [2] 2020 Target GPCD will be taken from the Regional Alliance's SB X7-7 Verification Form, Weighted Target Table.

Chapter 6
Water Supply Characterization

☑ ***CWC § 10631 (b)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

This chapter provides a description of the Bakersfield District's (also referred to herein as the "District") current water supplies, including its purchased water, a discussion of the underlying groundwater basin and its management, and potential supply sources, such as surface water, stormwater, and recycled water, as well as assessment of the energy intensity used to operate the Bakersfield District treatment and distribution system. This chapter includes the following sections:

6.1 Purchased Water

6.2 Groundwater

6.3 Surface Water

6.4 Stormwater

6.5 Wastewater and Recycled Water

6.6 Desalinated Water Opportunities

6.7 Water Exchanges and Transfers

6.8 Future Water Projects

6.9 Summary of Existing and Planned Sources of Water

6.10 Special Conditions

6.11 Energy Intensity

6.1 Purchased Water

☑ ***CWC § 10631 (h)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

California Water Service Company (Cal Water) currently purchases water from two sources to meet demands in its Bakersfield District: (1) untreated Kern River water purchased from City of Bakersfield (City), and (2) treated Kern River water and imported water purchased from Kern County Water Agency-Improvement District 4 (ID-4).

6.1.1 Purchases from City of Bakersfield

The City of Bakersfield holds pre-1914 appropriative rights to Kern River water. Cal Water has a signed long-term supply agreement with the City for up to 67,200 acre-feet per year (AFY) of this water supply. As described herein, Cal Water purchases untreated Kern River surface water from City and treats the water at the following water treatment facilities.

Northeast Bakersfield Water Treatment Plant

In June 2003, Cal Water commenced operation of the Northeast Bakersfield Water Treatment Plant (NEBWTP). The NEBWTP currently has a base load treatment capacity of 20 million gallons per day (MGD; or 22,403 AFY) and peaking capacity of 23 MGD.

Two planned additional expansions of the NEBWTP will provide additional treated water to the District. Phase 2 will add another 20 MGD (22,400 AFY) of base load treatment capacity to bring the total to 40 MGD (44,800 AFY) with a peaking capacity 46 MGD. Phase 2 is projected to be online by 2030. Phase 3 will add yet another 20 MGD (22,400 AFY) of base load capacity to bring the total to 60 MGD (67,200 AFY) with a peaking capacity of 69 MGD. Phase 3 is not projected to be online during the planning horizon of this Urban Water Management Plan (UWMP or Plan).

North Garden Water Treatment Plant

Cal Water has constructed a micro-filtration plant at the North Garden Water Treatment Plant (NGWTP) in North West Bakersfield that treats Kern River water and serves the area. The plant has a base load treatment capacity of 8.0 MGD (8,960 AFY) and a 10.4 MGD peaking capacity. Half of the plant's capacity is used to supply the City of Bakersfield under contract.

Southwest Bakersfield Water Treatment Plant

Phase 1 of the proposed Southwest Bakersfield Water Treatment Plant (WTP) will provide a base load treatment capacity of 20 MGD (22,400 AFY) with a peaking capacity of 23 MGD. Half of the plant's capacity will be used to supply the City of Bakersfield under contract.

Phase 2 of the proposed Southwest Bakersfield WTP will provide another 20 MGD (22,400 AFY) of base load treatment capacity to bring the total to 40 MGD (44,800 AFY) with a peaking capacity of 46 MGD. Again, half of the plant's Phase 2 capacity will be used to supply the City of Bakersfield under contract.

Implementation of Phases 1 and 2 will depend on the rate of growth in the southwest portion of the service area and is not anticipated within the planning horizon of this UWMP.

6.1.2 Purchases from Kern County Water Agency Improvement District 4

Cal Water also purchases imported water from ID-4. The Kern County Water Agency (KCWA) is a contractor of the State Water Project (SWP) and imports water for Municipal and Industrial (M&I) and agricultural use through the California Aqueduct. The KCWA also holds water rights to, and diverts water from, the Kern River.

The ID-4 built and operates a surface water treatment plant, the Henry C. Garnett Water Treatment Plant (HGWTP), that serves Cal Water, the East Niles Community Services District, and the North of the River Water District. The ID-4 obtains its water supply from KCWA entitlements to SWP supplies and Kern River flows and uses the water to recharge groundwater aquifers and to supply its conventional multi-media high-rate filtration plant (i.e., the HGWTP). The total treatment plant capacity of the HGWTP is about 47 MGD (53,000 AFY).

Rapid growth is occurring in the northwest Bakersfield area. To provide a reliable supply for this area, Cal Water entered into an agreement with KCWA for expansion of the HGWTP and construction of the Northwest feeder pipeline to convey water from the expanded plant. The Northwest feeder pipeline has been constructed and Cal Water has a contract with ID-4 to purchase 20,500 AFY of treated water from the HGWTP during normal hydrologic conditions, as well as access to a peaking capacity of 15.5 MGD. Further, depending on the needs of other water suppliers and the production capabilities of the plant, Cal Water can purchase up to 15 percent more than its contracted amount.

Every year Cal Water prepares a monthly demand schedule for this water and submits it to ID-4. The schedule is weighted so that the greatest volume of deliveries occurs during the peak summer demand period. The water acquired from ID-4 is obtained through five service connections.

6.2 Groundwater

☑ ***CWC § 10631***

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

Groundwater makes up an important portion of the Bakersfield District's water supply. This section includes information regarding the underlying basin description, groundwater management, and Cal Water's coordination with the relevant Groundwater Sustainability Agencies (GSAs), followed by a discussion of historical pumping and supply sufficiency, which is further supported by Section 7.1.1.

6.2.1 Basin Description and Status

As shown on Figure 6-1, the Bakersfield District overlies the Kern County Subbasin (also referred to herein as the "Basin") of the San Joaquin Valley Groundwater Basin (California Department of Water Resources [DWR] Basin No. 5-022.14). The Kern County Subbasin is not adjudicated,

however, in its recent evaluation of California groundwater basins, DWR determined that the Basin is in a condition of critical overdraft.[30]

The Kern County Subbasin is designated as a high priority basin under DWR's 2019 Phase 2 Basin Prioritization.[31] Under this prioritization process, basins are ranked on eight components, and if a basin is assigned more than 21 total points, it is defined as "high priority." The main factors driving the Basin's designation include population growth (5 out of 5 possible points), irrigated acreage per square mile (4 out of 5 possible points), groundwater reliance (4.5 out of 5 possible points), and documented impacts including declining groundwater levels and subsidence (4 out of 5 possible points).[32] However, because the Basin is critically overdrafted, the Basin is assigned 40 priority points, which is the maximum total points under DWR's ranking system.

The Kern County Subbasin covers an area of approximately 1,813,800 acres (2,834 square miles) and is located at the southern end of the San Joaquin Valley and contains the City of Bakersfield. The Basin is bounded on the west, southwest, and east by the bedrock formations of the coast range, San Emigdio Mountains, and Sierra Nevada, respectively. It is separated from the White Wolf Subbasin on the southeast by the White Wolf Fault. The northern boundary is generally coincident with the Kern County line.[33]

[30] DWR, 2019. Sustainable Groundwater Management Act 2018 Basin Prioritization, State of California, dated January 2019.
[31] Ibid.
[32] DWR's 2019 Phase 2 Basin Prioritization used the basin's total possible ranking points assigned to each of the eight components to determine the priority. A basin is defined as High Priority if it has more than 21 total ranking points.
[33] DWR, 2018. B118 Basin Description, Kings Subbasin, dated March 2018.

Figure 6-1. Groundwater Basin Underlying the Bakersfield District



Additional details on the Kern County Subbasin are given in the DWR's Groundwater Bulletin 118, as well as in the key documents described below related to groundwater management of the Basin, which are incorporated into this Urban Water Management Plan (UWMP or Plan) by reference:

- Final GSPs include current groundwater conditions, hydrogeologic conceptual model, water budget, local sustainable management criteria, and projects and management actions for reaching sustainability in the Basin by 2040, are available on the DWR Sustainable Groundwater Management Act (SGMA) Portal website. The final GSP for the Kern Groundwater Authority Groundwater Sustainability Agency (KGA GSA) can be accessed here:
  https://sgma.water.ca.gov/portal/gsp/preview/36

  The final GSP for the Kern River Groundwater Sustainability Agency (KRGSA) can be accessed here:
  https://sgma.water.ca.gov/portal/gsp/preview/54

  The final GSP for the Olcese GSA can be accessed here:
  https://sgma.water.ca.gov/portal/gsp/preview/44

- The final GSPs prepared by other GSAs within the Basin[34] are available on the DWR SGMA Portal website:
  https://sgma.water.ca.gov/portal/gsp/all

- The Kern Integrated Regional Water Management Plan (IRWMP), including detailed descriptions of basin hydrogeology, groundwater conditions, and groundwater monitoring practices, is available on the Kern IRWMP website:
  http://kernirwmp.com/documents.html

6.2.2 Non-SGMA Groundwater Management

Prior to the passage of SGMA, water agencies in the Kern County Subbasin cooperated in water supply and groundwater management efforts. The Basin was included in the Kern IRWMP and the Greater Bakersfield Subregion of the Kern IRWMP Region covers the Bakersfield District. Section 3 of the Kern IRWMP describes the physical, environmental, social, and demographic characteristics of the Greater Bakersfield Subregion, the hydrologic features and overall water reliability, major water related infrastructure, and the identified subregional issues, needs, challenges and priorities. [35]

The most recent update to the Kern IRWMP was adopted in March 2020. The five regional goals stated in the IRWMP include: (1) increase water supply, (2) improve operational efficiency, (3) improve water quality, (4) promote land use planning and resource stewardship, and (5) improve

[34] Five GSAs that prepared GSPs include the Kern Groundwater Authority GSA, Kern River GSA, Olcese GSA, Henry Miller Water District GSA, and Buena Vista Water Storage District GSA.
[35] Provost & Pritchard Consulting Group, 2020. Kern Integrated Regional Water Management Plan, dated March 2020.

regional flood management.[36] These regional goals were used to inform the measurable objectives and potential project proposals to accomplish the goals of the region. The GSPs (discussed below) supersede the IRWMP as the groundwater management plan for the Bakersfield District portion of the Basin.

6.2.3 SGMA Groundwater Management

In 2014, the California State Legislature enacted SGMA with subsequent amendments in 2015. Among other things, SGMA requires the formation of GSAs and the development and implementation of GSP) for groundwater basins that are designated by DWR as medium or high priority. As a high priority, critically overdrafted and non-adjudicated basin, the Kern County Subbasin is subject to the requirements of SGMA.

Eleven GSAs were formed to collectively assume responsibility for sustainable groundwater management of the Basin. The Bakersfield District falls within the jurisdiction of the KRGSA, the KGA GSA, and the Olcese GSA.

The eleven GSAs coordinated to prepare five GSPs within the Basin (i.e., KGA GSA GSP, KRGSA GSP, Olcese GSA GSP, Henry Miller Water District GSA GSP, and Buena Vista Water Storage District GSA GSP), but certain technical efforts (e.g., development of the Basin level Water Budget) were cooperatively developed through a Coordination Agreement. The majority of the Bakersfield District falls within the jurisdiction of the KRGSA GSP, which covers an area of 230,830 acres in the southeast-central portion of the Basin, including most of the City of Bakersfield. Small portions of the Bakersfield District also fall within the jurisdiction of the KGA GSA GSP and the Olcese GSA GSP. All of the Basin GSPs were submitted to DWR on or before the January 30, 2020 deadline.[37]

As defined under SGMA, sustainable yield means "the maximum quantity of water, calculated over a base period representative of long-term conditions in a basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing undesirable results."[38] Based on development and application of a numerical groundwater flow model for the Kern County Subbasin (C2VSimFG-Kern), the sustainable yield of the Basin is estimated to be approximately 1,313,000 AFY, plus or minus 10 percent, but was not further allocated.[39] The Basin-level estimate was supplemented by local water budget information presented in each GSP, but again the local sustainable yield was not formally allocated. For example, the KRGSA GSP estimated an initial sustainable yield of about 290,000 AFY to 320,000 AFY for its portion of

[36] Ibid.
[37] In total, five GSPs have been prepared by GSAs within the Basin.
[38] California Water Code (CWC) §10721(w)
[39] KGA GSA, 2020. Kern Groundwater Authority Groundwater Sustainability Plan, dated January 2020.

the Basin[40] and the Olcese GSA GSP estimated a sustainable yield of 890 AFY to 1,840 AFY for its portion of the Basin.[41]

Projects and management actions to support achievement of the Basin's sustainability goal under SGMA are proposed by the GSAs and documented in their respective GSPs. Specifically, for the GSPs that include the Bakersfield District:

- The "Phase One" projects described in the KRGSA GSP include: water allocation plan, Kern River optimized conjunctive use, expand recycled water use, conversion of agricultural lands to urban use, water system consolidation, and possible water exchange. These projects will begin being implemented prior 2025, but will require adjustment and possible re-direction over time to optimize project performance and avoid undesirable results.[42] In addition, the KRGSA proposed ten management actions to provide a framework for overall groundwater management including establishing GSP policies and filing data gaps that are also part of their planned Phase One.
- The projects and management actions described in the Olcese GSA GSP include: install a shallow monitoring well to evaluate potential hydraulic connection between Olcese sand aquifer unit and the shallow alluvium, conduct a study of shallow alluvium groundwater level response to pumping in the principal aquifer, and develop a subsidence monitoring network.
- The projects and management actions described in the KGA GSA GSP include: basin-wide subsidence monitoring, basin-wide groundwater modeling, study of native yield of the basin, KGA monitoring network improvement, and basin-wide coordination. The KGA GSA GSP also listed the projects and management actions that are proposed by the KGA member agencies. The details of each proposed project and management action can be found in each member agency's management area plan.

The long-term impacts of SGMA implementation in the Kern County Subbasin are still uncertain; however, it is the intent of the projects and management actions planned by the GSAs within the Basin to stabilize water levels and provide for sustainable management of the groundwater resource.

6.2.4 Cal Water Coordination with Groundwater Sustainability Agencies

Cal Water's groundwater basin management philosophy continues to be to work collaboratively with all stakeholders in the basins where we operate and to do what is best for the groundwater

[40] Ibid.
[41] Olcese GSA, 2020. Olcese Groundwater Sustainability Agency Groundwater Sustainability Plan, dated January 2020.
[42] KRGSA, 2020. Kern River Groundwater Sustainability Agency Groundwater Sustainability Plan, dated January 2020.

basin including the sharing of burden(s) and benefits on an equitable basis with said stakeholders. Cal Water recognizes and deeply supports the goals, objectives, and intended outcomes of the SGMA. Moreover, the company recognizes the numerous challenges of implementing the legislation along a variety of technical, legal, political, and financial/economic dimensions, particularly when the geographical diversity of the Cal Water's service territory is considered. Nonetheless, Cal Water intends to take an active role in the local and state-wide management of groundwater resources over the next five to 25+ years by fully supporting and participating in the principal edicts of SGMA. A number of specific steps that Cal Water has taken with respect to this position and role include (among others):

- Coordination with public agencies to ensure that Cal Water's presence, rights and interests, as well as historical and current resource management concerns are honored/incorporated within the GSA and GSP formulation process(es);
- Coordination with applicable local and regulatory agencies to ensure that Cal Water is at full participation, while also meeting the requirements and expectations set forth by SGMA;
- Enhanced use of digital/electronic groundwater monitoring equipment and other new technology aimed at measuring withdrawal rates, pumping water levels, and key water quality parameters within the context of day-to-day operations;
- Participation in the development of GSP's and formulation of groundwater models being constructed in basins where Cal Water has an operating presence;
- Participation in individual and/or joint projects aimed at mitigating seawater intrusion and other "undesirable results" where appropriate;
- Inclusion of sound groundwater management principles and data in all applicable technical reports, studies, facility master plans, and UWMPs (including this 2020 update), particularly as these undertakings relate or pertain to water resource adequacy and reliability; and,
- Inclusion of sound groundwater management principles and data in all general rate case (GRC) filings and grant applications to ensure that resource management objectives remain visible and central to Cal Water's long-term planning/budgeting efforts.

6.2.5 Historical Pumping and Supply Sufficiency

The groundwater used by the Bakersfield District is extracted from the underlying Kern County Subbasin. The District has a total of 130 wells located within the District service area boundaries shown in Figure 6-1.

There are 56 surface storage structures, enabling the groundwater wells to pump to storage during non-peak demand periods and provide peak day demand. The District has sufficient production capacity to supply all of the District's current annual average day and maximum day demand.

As noted above, groundwater is a portion of the supply for the Bakersfield District. Table 6-1 lists the amount of groundwater pumped by Cal Water over the past five years. The available groundwater supply and the purchased water supply have been sufficient to meet all of the District's demands in the past five years and all prior years.

Section 7.1.1 presents an analysis of the availability of supply for the District based on historical surface water and groundwater use and review of available information regarding future supply availability to the Bakersfield District, including the impacts of SGMA. Based on the available information, the available groundwater supply and the purchased water supply are expected to be sufficient to meet the projected future demands of the District in normal and multiple dry year periods through 2045. It should be noted that the Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

Table 6-1. Groundwater Volume Pumped (DWR Table 6-1)

	Supplier does not pump groundwater. The supplier will not complete the table below.					
	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	Kern County Subbasin	30,552	31,669	32,498	27,895	29,249
	TOTAL	30,552	31,669	32,498	27,895	29,249
NOTES: (a) Volumes are in units of AF.						

6.3 Surface Water

Cal Water purchases untreated local surface water from the City of Bakersfield, and treated local surface and imported water from KCWA ID-4, as described above in Section 6.1.

6.4 Stormwater

There are no plans to divert stormwater for beneficial uses in the Bakersfield District.

6.5 Wastewater and Recycled Water

☑ ***CWC § 10633***

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

The recycling of wastewater offers several benefits to Cal Water and its customers. Perhaps the greatest of these benefits is to help maintain a sustainable groundwater supply either through direct recharge, or by reducing potable supply needs by utilizing recycled water for appropriate uses (e.g., landscape irrigation) now being served by potable water. Currently, no wastewater is recycled for direct reuse from the domestic or industrial wastewater streams in the District. Indirect recycling occurs through the recharge of groundwater. The potential amount of recycled water that can be produced is proportional to the amount of wastewater that is generated by the District, and is discussed in the following sections.

6.5.1 Recycled Water Coordination

The Bakersfield District relies on and coordinates with the City of Bakersfield Public Works Department, Kern Sanitation Authority, and North of River Sanitation District Number 1 for relevant wastewater collection, treatment, and discharge. There are no current plans to bring recycled water into the District area.

6.5.2 Wastewater Collection, Treatment, and Disposal

☑ ***CWC § 10633 (a)***

A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

☑ ***CWC § 10633 (b)***

A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

Four wastewater treatment plants serve the City of Bakersfield (and the District). The City of Bakersfield owns, operates, and maintains the sewer collection system for Wastewater Treatment Plant No.2 and Wastewater Treatment Plant No.3. The Kern Sanitation Authority and North of River Sanitary District Number 1 also own and maintain the sewer systems for their respective treatment plants. None of the wastewater treatment plants are located within the District's boundaries.

Table 6-2 includes an estimate of the volume of wastewater collected from District customers in 2020. The estimate is calculated by annualizing 90 percent of January water use in the service area. As shown in Table 6-3, no wastewater is treated or disposed of within the District.

The City's collection systems contain approximately 1,069 miles of sewer main, six inches in diameter and greater, and raw sewage pump and lift stations.[43] All four wastewater treatment plants servicing the District utilize secondary treatment. Wastewater Treatment Plant No.2 is a trickling filter facility with a design capacity of 25 MGD and current average daily flow of 13.7 MGD. Wastewater Treatment Plant No.3 is an activated sludge plant facility with a design capacity of 32 MGD and a current average flow of 17.3 MGD.[44] The Kern Sanitation Authority wastewater treatment plant treats approximately 4.0 MGD of industrial, commercial, and domestic wastewater via a headworks screening unit, two primary clarifiers, an anaerobic digester, two trickling filters, two secondary clarifiers, and recirculation pumps.[45] Effluent from the Kern Sanitation Authority wastewater treatment plant is used to irrigate 1,100 acres of adjacent farmland.[46] North of River Sanitary District Number 1 wastewater treatment plant treats approximately 7.5 MGD of domestic and commercial wastewater, and the effluent is recycled on adjacent irrigated farmland.[47]

Currently, as shown in Table 6-3, no wastewater is recycled for direct reuse within the Bakersfield District service area. The cost of implementation of a recycled water system for reuse in the District is not planned at this time and will likely only be considered if conditions related to District supply change significantly in the future. As such, as shown in Table 6-4, there is no projected recycled water supply for the District through the year 2045.

[43] City of Bakersfield, 2014. City of Bakersfield Public Works Department Sewer System Management Plan, dated December 2014.
[44] City of Bakersfield Department of Public Works website: https://www.bakersfieldcity.us/gov/depts/public_works/sewer/wastewater_treatment_plants.htm
[45] Kern Public Works website: https://kernpublicworks.com/building-and-development/sewer-information/
[46] Ibid.
[47] North of River Sanitary District website: https://www.norsd.com/services

Table 6-2. Wastewater Collected Within Service Area in 2020 (DWR Table 6-2)

	There is no wastewater collection system. The supplier will not complete the table below.
	Percentage of 2020 service area covered by wastewater collection system *(optional)*
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
City of Bakersfield	Estimated	14,290	City of Bakersfield	Wastewater Treatment Plant No.2	No	
City of Bakersfield	Estimated	9,249	City of Bakersfield	Wastewater Treatment Plant No.3	No	
Kern Sanitation Authority	Estimated	3,619	Kern Sanitation Authority	Kern Sanitation Authority Wastewater Treatment Plant	No	
North of River Sanitation District	Estimated	3,773	North of River Sanitation District	North of River Sanitation District Wastewater Treatment Plant	No	
Total Wastewater Collected from Service Area in 2020:		30,931				

NOTES:
(a) Volumes are in units of AF.

(b) North of River Sanitation District Wastewater Treatment Plant serves the North Garden PWS only, and the other three wastewater treatment plants listed herein serve both Bakersfield PWS and North Garden PWS.

Table 6-3. Wastewater and Discharge Within Service Area in 2020 (DWR Table 6-3)

X	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
						Total					

NOTES:

6.5.3 Recycled Water System and Recycled Water Beneficial Uses

☑ ***CWC § 10633 (c-g)***

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

As shown in Table 6-4 and Table 6-5, the Bakersfield District does not have any current or projected beneficial use of recycled water.

Table 6-4. Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)

X	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.
Name of Supplier Producing (Treating) the Recycled Water:	
Name of Supplier Operating the Recycled Water Distribution System:	
Supplemental Water Added in 2020 (volume)	
Source of 2020 Supplemental Water	

Beneficial Use Type	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity)	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
				Total:						
					2020 Internal Reuse					

NOTES:

Table 6-5 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5)

X	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below.

Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Total		
NOTES:		

6.5.4 Actions to Encourage and Optimize Future Recycled Water Use

At this time, as shown in Table 6-6, Cal Water does not have plans to initiate/expand the use of recycled water within the Bakersfield District. Cal Water's supply portfolio in some districts already includes recycled water; elsewhere, Cal Water is participating in studies of the possibility of adding this supply source. Cal Water is eager to expand its portfolio to provide recycled water to its customers wherever feasible, and to form partnerships with other agencies and jurisdictions to accomplish this. However, any such project must be economically feasible and approval of such an investment by the California Public Utilities Commission (CPUC) is contingent on a demonstration that it is beneficial to ratepayers.

Table 6-6. Methods to Expand Future Recycled Water Use (DWR Table 6-6)

X	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.
Section 6.5.4	Provide page location of narrative in UWMP

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
		Total	
NOTES:			

6.6 Desalinated Water Opportunities

☑ ***CWC § 10631 (g)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

The Bakersfield District is located in the southern Central Valley, many miles from the nearest source of saline water. As such, there are no opportunities for the development of desalinated water in the District.

6.7 Water Exchanges and Transfers

☑ ***CWC § 10631 (c)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

6.7.1 Exchanges

Cal Water is not pursuing water exchanges involving the Bakersfield District and other entities at the time.

6.7.2 Transfers

Cal Water is not pursuing water transfers involving the Bakersfield District and other entities at the time.

6.7.3 Emergency Interties

The District currently has interties with ID-4, as discussed in Section 6.1, as well as with the City of Bakersfield.

6.8 Future Water Projects

☑ ***CWC § 10631*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

(b) (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

Cal Water has an active well maintenance program to monitor all of the wells and identify which wells need to be replaced to maintain the reliability of the system. Cal Water will maintain sufficient wells and distribution facilities to meet the anticipated increases in future demand as needed.

As discussed in Section 6.1.1, phase 2 expansion of the NEBWTP will provide additional treated water to the District and it is projected to be online by 2030. Other potential construction or expansions of Cal Water's water treatment plants are discussed in Section 6.1.1; however, those are not projected to be online during the planning horizon of this UWMP. Table 6-7 shows the planned future water supply projects or programs that are expected to provide a quantifiable increase to the District's water supply.

Table 6-7. Expected Future Water Supply Projects or Programs (DWR Table 6-7)

	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.
	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.
	Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Y/N	*If Yes, Supplier Name*				
Northeast Bakersfield Water Treatment Plant expansion	Yes	City of Bakersfield	Increased water treatment plant base load capacity	2030	Average Year	14,463

NOTES:
(c) Volumes are in units of AF.
(d) Based on the entire purchase record, the District's historical maximum purchase from the City of Bakersfield is 14,463 AFY between 2003 and 2020 for NEBWTP. Given that the NEBWTP will have an expansion that will double its capacity by 2030, the projected purchased water from City of Bakersfield that is treated in the NEBWTP is also assumed to be double by 2030 (i.e., the available supply from the NEBWTP increases from 14,463 AFY to 28,926 AFY). Therefore, the expected increase in water supply to supplier presented here is 14,463 AFY.

6.9 Summary of Existing and Planned Sources of Water

☑ ***CWC § 10631 (b)*** *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

☑ ***CWC § 10631 (b) (2)***

When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

☑ ***CWC § 10631 (b) (4) (D)*** *A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Table 6-8 summarizes the actual volumes of purchased water and groundwater production for calendar year 2020, as applicable.

As discussed above, and shown in Table 6-9, Cal Water has signed a long-term supply agreement for up to 67,200 AFY of untreated Kern River water with the City of Bakersfield. Cal Water also has a contract with KCWA ID-4 to purchase up to 20,500 AFY of treated water.

While the exact split between the District's future use of groundwater and surface water is unknown, the projected volume of purchased water from both sources shown in Table 6-9 is based on: (1) the historical maximum amount purchased to date by the District from each source as shown in Appendix D, rounded to the hundreds (i.e., 17,400 AFY from the City and 18,900 AFY from ID-4)[48], and (2) the assumed availability of an additional 14,500 AFY of water purchased from City once the increased treatment capacity becomes available at the NEBWTP in 2030.[49]

Once the other planned water treatment plant expansion projects are completed, Cal Water would have the capacity to utilize even more of its full contractual allocation. It should be noted that the projected purchased water supply volumes shown in Table 6-9 are less than the District's contractual allocations, and do not represent the total water supply available to the District in a given year.

In the interim, and during any surface (purchased) water supply shortages, groundwater supply will be used to serve any remaining District demand that is not met with purchased water supplies. Therefore, the sum of purchased water and groundwater supply amounts shown in Table 6-9 equal the projected demand in each year (see Section 7.1.1).

It should also be noted that the Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

[48] Based on the entire purchase record, the District's historical maximum purchase from the City of Bakersfield is 14,463 AFY between 2003 and 2020 for NEBWTP and 2,920 AFY between 2010 and 2020 for NGWTP, for a total of 17,382 AFY. The District's historical maximum purchase from KCWA ID-4 is 18,879 AFY between 1980 and 2020.

[49] Given that the NEBWTP, which treats purchased water from the City of Bakersfield, will have an expansion that will double its capacity by 2030, the projected purchased water from City of Bakersfield that is treated in the NEBWTP is also assumed to be double by 2030 (i.e., the available supply from the NEBWTP increases from 14,463 AFY to 28,926 AFY, and the total available supply from the City of Bakersfield increases from 17,400 to 31,900 AFY).

Table 6-8. Water Supplies – Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Groundwater (not desalinated)	Kern County Subbasin	29,249	Drinking Water	
Purchased or Imported Water	KCWA ID-4	16,807	Drinking Water	20,500
Purchased or Imported Water	City of Bakersfield	13,362	Drinking Water	67,200
	Total	59,418		
NOTES: (a) Volumes are in units of AF.				

Table 6-9. Water Supplies – Projected (DWR Table 6-9)

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Purchased or Imported Water	Surface water purchased from KCWA ID-4	18,900	20,500	18,900	20,500	18,900	20,500	18,900	20,500	18,900	20,500
Purchased or Imported Water	Surface water purchased from City of Bakersfield	17,400	67,200	31,900	67,200	31,900	67,200	31,900	67,200	31,900	67,200
Groundwater (not desalinated)	Kern County Subbasin	24,139		11,881		14,608		17,071		19,514	
	Total	60,439		62,681		65,408		67,871		70,314	

NOTES:
(a) Volumes are in units of AF.
(b) The Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

6.10 Special Conditions

6.10.1 Climate Change Effects

Cal Water is committed to incorporating climate change into its ongoing water supply planning. Section 4.3 of this Plan includes a description of plausible changes to projected demands under climate change conditions, and Cal Water is currently working to consider the effects of climate change in future demand modeling. The impact of climate change on District supplies is addressed in detail in the key resources described below, which are incorporated into this Plan by reference:

- Cal Water is currently in the process of developing a multi-phase climate change study. Phase 1, which primarily consisted of a literature and tools review of previous and complementary studies, was completed in December 2020.[50] Phase 2 will include District-level vulnerability assessments of Cal Water's facilities and operations, including developing an assessment approach that evaluates climate impacts to Cal Water, identifies asset vulnerabilities, and prioritizes climate risks. Phase 3 will focus on an assessment of climate-driven impacts to water supply resources and demand. Phase 2 is expected to be completed by December 2021. The executive summary of Phase 1 of this study is included in this Plan in Appendix F.

- In 2016, Cal Water completed a study of climate change impacts on a representative subset of its districts to gain a better understanding of the potential impacts of climate change on the availability of its diverse supplies.[51] The 2016 study relied on the best available projections of changes in climate (temperature and precipitation) through the end of the century to examine how surface water flows and groundwater recharge rates may change. The executive summary of this study is included in this Plan in Appendix F.

- SGMA dictates that GSPs include basin-wide water budget models under various climate change scenarios, including future conditions which account for the effects of estimated climate change. The final KGA GSA, KRGSA, and Olcese GSA GSPs are available on the DWR website:
  https://sgma.water.ca.gov/portal/gsp/all

[50] ICF, 2020. California Water Service Climate Change – Water Resource Monitoring and Adaptation Plan – Phase 1, prepared by ICF, dated December 17, 2020.
[51] California Water Service Company, 2016. Potential Climate Change Impacts on the Water Supplies of California Water Service, prepared by Gary Fiske and Associates, Inc. and Balance Hydrologics, Inc., dated January 2016.

6.10.2 Regulatory Conditions and Project Development

Emerging regulatory conditions (e.g., issues surrounding the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary [Bay-Delta Plan]) may affect planned future projects and the characterization of future water supply availability and analysis. The District does not have any current plans to develop additional supply sources. If the District does move forward with any plans to develop supply projects, emerging regulatory conditions will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

Detailed information is provided below regarding Delta Reliance. The source for the information is the draft KCWA ID-4 2020 UWMP Appendix C provided by ID-4.

Draft KCWA ID-4 2020 UWMP Appendix C

ID4's service area, as a whole, reduces reliance on the Delta through investments in non - Delta water supplies, local water supplies and regional and local demand management measures. ID4's purveyors coordinate reliance on the Delta through ID4, an improvement district of the Agency [KCWA] providing a supplemental water supply to the metropolitan Bakersfield area.

ID4 purveyors, indirectly reduce reliance on the Delta through their collective efforts. ID4 purveyors do not control the amount of Delta water they receive from the Agency [KCWA] as ID4 manages an integrated conveyance system consisting of its participation in the SWP, local water management programs and its participation in groundwater banking facilities. ID4 and the purveyors implement demand management measures (DMMs) applicable to both wholesale and retail urban water suppliers to increase the future reliability of water resources for the metropolitan Bakersfield area. In addition, DMMs provide systemwide benefits by decreasing the demand for imported water, which helps to decrease the burden on the purveyors' infrastructure and reduce system costs.

ID4's costs are funded almost entirely from its service area, with the exception of grants received from government programs. Zone of Benefit No. 7 (coterminous with ID4 boundaries) was established to account for the revenues collected through ad valorem assessments and expenditures associated with the purchase of SWP water for the metropolitan Bakersfield area. All of ID4's operating revenues are collected directly from the purveyors to pay for the costs associated with the provision of a wholesale water supply. Thus, ID4's purveyors fund nearly all operations undertaken to reduce reliance on the Delta, including water management programs, water exchanges and continued investment in groundwater banking facilities.

Because of the integrated nature of ID4's systems and operations, it is infeasible to quantify each of the purveyor's individual reliance on the Delta. It is infeasible to attempt to segregate an entity and a system that were designed to work as part of ID4's integrated system.

In addition to the purveyors funding ID4's regional efforts, they also invest in their own local programs to reduce their reliance on any imported water. Moreover, the customers of those purveyors may also make investments to reduce water demand. However, to the extent those efforts result in reduction of demands on ID4, that reduction does not equate to a like reduction of reliance on the Delta. Demands on ID4 are not commensurate with demands on the Delta because all of ID4 purveyors receive blended resources from ID4 as determined by ID4. The resource blend varies from month - to - month and year - to year due to hydrology, operational constraints, use of storage and other factors.

Storage Investments/Facilities

Surface and groundwater storage are critical elements of ID4's water resources strategy and help reduce its reliance on the Delta. Because California experiences dramatic swings in weather and hydrology, storage is important to regulate those swings and mitigate possible supply shortages. Surface and groundwater storage provide a means of storing water during normal and wet years for later use during dry years, when imported supplies are limited. ID4 has invested in numerous groundwater banking facilities for purposes of meeting demands during times of shortage, regulating system flows and ensuring system reliability in the event of a system outage.

Future Water Projects

ID4 plans to implement the second phase of the Cross Valley Canal (CVC) Extension Lining Project. The westerly 17 miles of the CVC (Pool Nos. 1 – 6) are concrete - lined to minimize water losses. ID4 completed the first phase of the CVC Extension Lining Project in 2017 by constructing a concrete liner in Pool No. 7 to reduce infiltration losses. Phase 2 consists of lining Pool No. 8 and is expected to be constructed within the next 5 years.

By installing the concrete liner in Pool Nos. 7 and 8, infiltration losses are expected to be reduced by at least 80 percent. Reducing infiltration losses in dry years is especially important as ID4 recovers banked groundwater and delivers it to the Henry C. Garnett Water Purification Plant. Implementing Phase 1 enabled ID4 will be able to reduce groundwater pumping in dry years by an estimated annual average of 1,000 af (50,500 af over the 50 - year life of the project). Implementing Phase 2 will enable ID4 to further reduce groundwater pumping in dry years by an estimated annual average of 850 af (42,500 af over the 50 - year life of project).

ID4 Demand Management Measures

In 1991, ID4 became a signatory to the Memorandum of Understanding (MOU) of the California Urban Water Conservation Council (CUWCC) and complied with all of the Best Management Practices (BMPs) applicable to wholesale water suppliers. The CUWCC was a consensus - based partnership of agencies and organizations concerned with water supply and conservation of natural resources in California until its sunset. ID4 continues to participate in the successor

organization, the California Water Efficiency Partnership, to stay informed of California water issues, challenges and opportunities within a broad collaborative framework.

Public Information and Water Education Programs

ID4 undertakes efforts throughout its service area that help achieve water savings without the use of rebates. As detailed in section 9.1.2, ID4's 30 - year implementation of public information and water education DMMs include:

- Participation in regional water conservation public information campaigns.
- Hosting water education workshops for teachers.
- Conducting an annual water awareness poster contest.
- Offering educational assemblies and presentations to students in grades K – 12.

Public Information and Water Education Programs

The accounting of regional investments that contribute to reduced reliance on supplies from the Delta watershed is straightforward to calculate and report at the regional aggregate level. However, any similar accounting is infeasible for the purveyors or their customers. As described above, ID4 makes significant investments in projects, programs and other resources that reduce reliance on the Delta. In fact, all of ID4's investments in groundwater and surface storage, future water projects, water management programs, water exchanges and DMMs that reduce reliance on the Delta are collectively funded by revenues generated from the purveyors through rates and charges.

ID4's revenues cannot be matched to the demands or supply production history of an individual purveyor. Accounting at the regional level allows for the incorporation of the local supplies and water use efficiency programs done by purveyors and their customers through both the regional programs and through their own specific local programs. As shown above, despite the infeasibility of accounting reduced Delta reliance below the regional level, ID4's member agencies and their customers have together made substantial contributions to the region's reduced reliance.

Additional details on reduced reliance calculation is provided in the Appendix C of the draft KCWA ID-4 2020 UWMP.

6.10.3 Other Locally Applicable Criteria

Other locally applicable criteria may affect characterization and availability of an identified water supply (e.g., changes in regional water transfer rules may alter the availability of a water supply that had historically been readily available). The District does not have any current plans to develop additional supply sources. If the District does move forward ahead with any plans to

develop supply projects, locally applicable criteria will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

Under SGMA, GSAs have the authority to implement projects and management actions that help the Kern County Subbasin reach its sustainability goal, including such actions as setting allocations for groundwater pumping, prohibiting development of new groundwater wells, or implementing fees for pumping volumes. As described in Section 6.2, the GSPs for Basin were completed in January 2020. As such actions are implemented, Cal Water will consider them as a part of its future supply planning efforts.

6.11 Energy Intensity

☑ ***CWC § 10631.2***

(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:
(1) An estimate of the amount of energy used to extract or divert water supplies.
(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
(3) An estimate of the amount of energy used to treat water supplies.
(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
(6) An estimate of the amount of energy used to place water into or withdraw from storage.
(7) Any other energy-related information the urban water supplier deems appropriate.
(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.
(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

The "Total Utility Approach" as defined by DWR in the UWMP Guidebook 2020 is used to report water-related energy-consumption data for the Bakersfield District. Calendar year 2019 is selected as the one-year reporting period, and utility bills for the associated time period are used as the source for energy consumption data. Utility bills reported the following energy consumption data for the Bakersfield District during calendar year 2019:

$$Total\ Energy\ Consumed\ by\ the\ Bakersfield\ District = 30{,}141{,}730\ kilowatt\ hour\ (kWh)$$

Table 6-10 shows the energy consumed for each acre-foot (AF) of water entering the distribution system in the Bakersfield District, including energy associated with the pumping, treatment, conveyance, and distribution of drinking water, but not including energy associated with the

treatment of wastewater. Based on this, the energy intensity is estimated to be 533 kilowatt hours per acre-foot (kWh/AF).

Table 6-10. Recommended Energy Intensity – Total Utility Approach (DWR Table O-1B)

Urban Water Supplier: *Bakersfield District*

Water Delivery Product

Retail Potable Deliveries

Enter Start Date for Reporting Period	1/1/2019	Urban Water Supplier Operational Control		
End Date	12/31/2019			
Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	AF	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*56,525*	*0*	*56,525*
Energy Consumed (kWh)		*30,141,730*	*0*	*30,141,730*
Energy Intensity (kWh/volume)		*533*	*0.0*	*533*

Quantity of Self-Generated Renewable Energy

N/A kWh

Data Quality

Metered Data

Data Quality Narrative:

Utility bills for the associated time period are used as the source for energy consumption data.

Narrative:

Total energy consumption represents the energy consumed during pumping, treatment, conveyance, and distribution.

Chapter 7
Water Supply Reliability Assessment

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This chapter describes the reliability of the Bakersfield District's (also referred to herein as the "District") water supplies. Assessment of water supply reliability is complex and dependent upon a number of factors, such as the number of water sources, regulatory and legal constraints, hydrological and environmental conditions, climate change, and expected growth, among others. Based on available historical information and projections of future water uses, regulatory and legal constraints, and hydrological and environmental conditions, including climate change, California Water Service Company (Cal Water) has made its best determination of future water supply reliability of for the District. This chapter includes the following sections:

7.1 Constraints on Water Sources

7.2 Reliability by Type of Year

7.3 Supply and Demand Assessment

7.4 Water Supply Management Tools and Options

7.5 Drought Risk Assessment

7.1 Constraints on Water Sources

Groundwater and purchased water from City of Bakersfield (City) and Kern County Water Agency - Improvement District No. 4 (ID-4) are the supply sources for the Bakersfield District. Cal Water has identified several potential constraints on future purchased water and groundwater supply availability, including water quality and climate change. These constraints, along with associated management strategies are summarized in the following sections.

7.1.1 Supply Availability

As discussed in Chapter 6, Cal Water expects that, under all hydrologic conditions, the combination of its purchased water and groundwater supply for the Bakersfield District will fully meet future demands. This assessment is based on the available information regarding purchased water and groundwater supply availability to the District and the additional information presented below.

Purchased Water

Purchased water supplies to the District are available pursuant to long-term supply agreements between Cal Water and two wholesalers, the City of Bakersfield and ID-4.

The agreement with the City of Bakersfield allows the District to receive untreated Kern River surface water at a rate of up to 67,200 acre-feet per year (AFY) regardless of water year type (i.e., 100 percent reliable). The City holds pre-1914 appropriative rights to the Kern River surface water. The surface water is treated at the Northeast Bakersfield Water Treatment Plant (NEBWTP), which currently has a capacity of 22,403 AFY, and the North Garden Water Treatment Plant (NGWTP), which has a capacity of 8,960 AFY.[52] The NEBWTP is undergoing a phase 2 expansion that will add another 22,400 AFY of base load capacity to bring the total to 44,800 AFY. This expansion is projected to be online by 2030.

The agreement with ID-4 allows the District to receive up to 20,500 AFY of treated Kern River surface water and imported State Water Project (SWP) water during normal hydrologic conditions. Cal Water can purchase up to 15 percent more than this amount depending on the needs of other water suppliers and the production capabilities of the ID-4 treatment plant (which has a total capacity of about 53,000 AFY). Based on the information provided by ID-4, [53] ID-4's supplies are adequate to meet its projected demands on average in normal year, single dry year, and multiple dry years.

In case of purchased water supply shortages, groundwater supply will be used to serve any remaining projected demand that is not met with purchased water supplies. Given that Cal Water's agreements with the City of Bakersfield and ID-4, purchased water supplies (in combination with groundwater supply discussed below) are expected to be sufficient to meet projected water demands of the District under all hydrologic conditions, including in normal, single dry, and multiple dry years.

[52] Half of the total base load (4,480 AFY, 4.0 MGD) of the treated surface water from NGWTP is supplied to the City of Bakersfield under contract.
[53] Draft Table 7-2 to 7-4 of the ID-4 UWMP provided by KCWA ID-4 on April 27, 2021.

Groundwater

Historically, the groundwater supplies available to the Bakersfield District from the underlying Kern County Subbasin (Basin) have always been sufficient to meet District demands and the Cal Water supply wells have not dewatered, even during historical drought periods. Due to successful conservation efforts and response to the historic drought spanning water years 2012-2015, water demand (and thus District groundwater pumping volumes) were significantly lower from 2016 through 2020 (i.e., averaging 30,373 AFY) than they had been in the previous ten years (i.e., averaging 45,878 AFY from 2006 through 2015), as shown in Appendix D.

It is also important to note that from a regional and Basin-wide standpoint, Bakersfield District pumping is only a small fraction of total groundwater pumping. Based on Figure 2-53 presented in the Kern Groundwater Authority (KGA) Groundwater Sustainability Agency (GSA) Groundwater Sustainability Plan (GSP), also shown on Figure 7-1 below, average annual groundwater pumping from water year 1995 to 2014 within the Basin was approximately 1,590,373 AFY.[54] Approximately 78 percent of that pumping was for irrigated agriculture, while total municipal and Industrial (M&I) pumping (inclusive of the District) only accounted for approximately 12.5 percent of total pumping. It is therefore likely that management of agricultural groundwater use, rather than M&I use, will be a much larger determining factor in maintaining groundwater sustainability in the Basin in the future.

[54] Ibid.

Figure 7-1. Groundwater Pumping by Type for Kern County Subbasin Figure from the KGA GSP

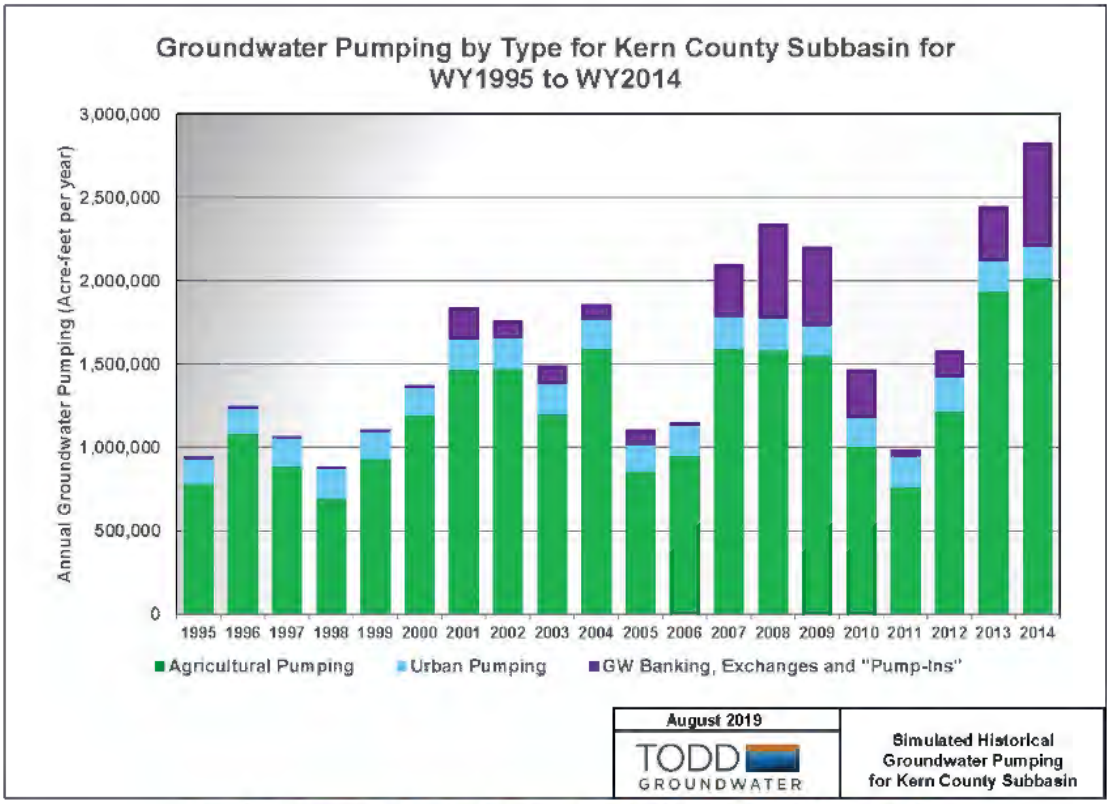


Figure 2-53. Groundwater Pumping by Type for Kern County Subbasin for WY1995 to WY2014

Further, although a significant amount of growth is projected in the Bakersfield District over the planning horizon (i.e., the District is projecting that service area population will increase by approximately 24 percent over the next 25 years), as discussed in Section 3.4, it is anticipated that some land currently used for agricultural production will be converted to residential and non-residential urban uses to accommodate future growth. Irrigated agriculture typically uses more water on a per-acre basis than urban uses, thus, some future growth within the District will likely result in a net decrease in water use within the Basin. Based on the Kern River GSA GSP, which covers the majority of the District, approximately 10,000 acres of current KRGSA agricultural lands are expected to be urbanized representing a projected demand reduction of 27,000 AFY.[55]

Cal Water holds certain water rights to groundwater it has pumped and used as an overlying owner and appropriator. Cal Water's water rights have been dedicated to a public use, and Cal Water is required by the California Public Utilities Commission (CPUC) to provide water to all customers within its designated service area under reasonable rules and regulations. Further,

[55] KRGSA, 2020. Kern River Groundwater Sustainability Agency Groundwater Sustainability Plan, dated January 2020.

under California law municipal water rights and uses have a higher priority and are entitled to more protection than other uses of water, including in connection with the Sustainable Groundwater Management Act (SGMA). Use of water for domestic purposes is recognized as the "highest use" of water in the State of California pursuant to California Water Code (CWC) §106, and the rights of urban water purveyors should be protected to the fullest extent necessary for existing and future uses, pursuant to CWC §106.5.

SGMA was intended to preserve the security of water rights in the state to the greatest extent possible, and was not intended to determine, modify or alter any surface water or groundwater rights or priorities. (CWC §10720.1(b), 10720.5(a) and (b).) SGMA should therefore not reduce, adversely impact or limit Cal Water's present or future exercise of its domestic water rights or its obligation to serve its municipal customers, and Cal Water's rights should be subject to less restrictions and limitations than any other types of water rights or uses.

Because of the demonstrated ability of the Bakersfield District to meet historical demands with the purchased water and groundwater supplies, the available supplies are considered to be equal to District demands under all conditions (i.e., current and projected, and for normal, single dry, and multiple dry years including a five-year drought period).

7.1.2 Water Quality

☑ ***CWC § 10634***

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Impaired water quality also has the potential to affect water supply reliability. Cal Water has and will continue to meet all state and federal water quality regulations. All drinking water standards are set by the U.S. Environmental Protection Agency (USEPA) under the authorization of the Federal Safe Drinking Water Act of 1974. In California, the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW) can either adopt the USEPA standards or set more stringent standards, which are then codified in Title 22 of the California Code of Regulations. There are two general types of drinking water standards:

- **Primary Maximum Contaminant Levels (MCLs)** are health protective standards and are established using a very conservative risk-based approach for each constituent that takes into potential health effects, detectability and treatability, and costs of treatment. Public water systems may not serve water that exceeds Primary MCLs for any constituent.

- **Secondary MCLs** are based on the aesthetic qualities of the water such as taste, odor, color, and certain mineral content, and are considered limits for constituents that may affect consumer acceptance of the water.

Cal Water routinely monitors its wells and the water that is treated and served to customers to ensure that water delivered to customers meets these drinking water standards. The results of this testing are reported to the SWRCB DDW following each test and are summarized annually in Water Quality Reports (also known as "Consumer Confidence Reports"), which are provided to customers by mail and made available on Cal Water's website: https://www.calwater.com/waterquality/water-quality-reports/. Additionally, a detailed review of the water quality conditions of the underlying groundwater basin are provided in the GSPs, available on the DWR SGMA Portal website: https://sgma.water.ca.gov/portal/gsp/all.

Although there is the potential for some regulated constituents to be present in source water, as documented in the Water Quality Reports, the District's monitoring, management, and treatment of its water results in high quality drinking water meeting all drinking water standards being served to customers. Cal Water tracks changes in constituent concentrations to proactively address water quality issues before they impact supply reliability.[56] In the event that water quality constituents are detected in source water at concentrations requiring treatment, the District is able to take impacted source(s) offline to implement appropriate treatment. Further, as part of the siting process for all new wells, Cal Water evaluates the presence of groundwater contamination and avoids placing wells in areas of known contamination.

Given Cal Water's proactive monitoring and management of water quality in its source water supplies, water quality is not expected to impact the reliability of the District's available supplies within the planning horizon (i.e., through 2045).

7.1.3 Climate Change

☑ ***CWC § 10631 (b) (1)***

…For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

Section 6.10 provides a summary of the assessments of the applicable climate change on supplies that Cal Water has previously performed and those planned for the near term, as well as those related to SGMA efforts for the Kern County Subbasin. The GSP water budget modeling efforts in the Basin incorporated climate change factors for hydrology and surface water supplies using the California Department of Water Resources (DWR) Central Tendency climate change scenarios to obtain estimated climate change impacts. Section 4.3 of this Urban Water Management Plan

[56] Cal Water, 2018. Direct Testimony of Director of Water Quality, 2018 CPUC Rate Case Filing.

(UWMP or Plan) presents information on how the impacts of climate change are factored into projected demands in the District. Cal Water is actively working to further quantify and consider future climate change impacts as part of its ongoing supply and operations planning.

7.2 Reliability by Type of Year

☑ ***CWC § 10631 (b)***

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

☑ ***CWC § 10631 (b)(1)***

A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

Per the UWMP Guidebook 2020, the water service reliability assessment includes three unique year types:

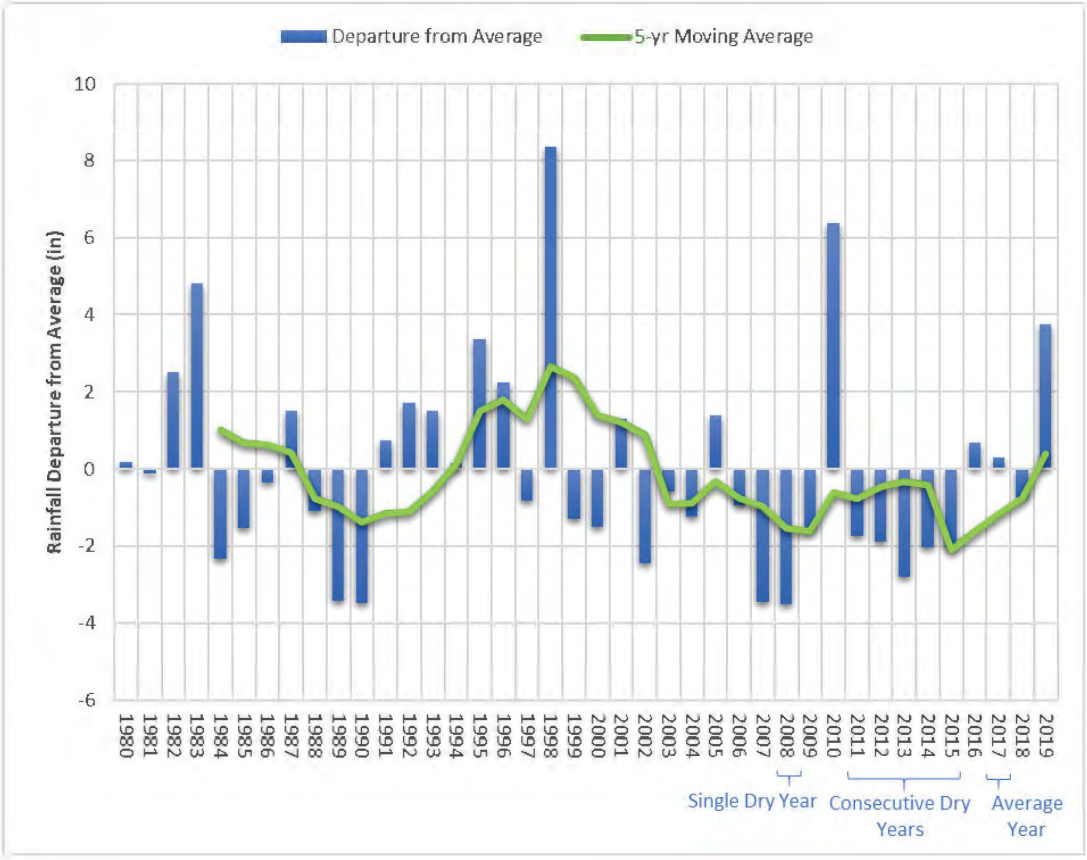
- A normal hydrologic year represents the water supplies available under normal conditions, this could be an averaged range of years or a single representative year,
- A single dry year represents the lowest available water supply, and
- A five-consecutive year drought represents the driest five-year period in the historical record.

Identification of these dry year periods consistent with the UWMP Guidebook 2020 methodology is provided below.

Figure 7-2 compares annual rainfall to the historic average (6.55 inches). The designation of Base Years for drought planning shown in Table 7-1 below comes from the data underlying this chart. The Cal Water production data record for the Bakersfield District begins in the year 1980; therefore, the following year type analysis uses the historical period from 1980 to 2019.

A normal hydrologic year occurred in 2017 when precipitation was approximately 4.6 percent above the historic average for the period from 1980 to 2019. The driest year occurred in 2008 when the rainfall was approximately 54 percent below average (3.04 inches). This is taken as the single dry year shown in Table 7-1. The multiple dry water years used to represent a five-consecutive year drought are 2011 through 2015. This period represents the driest five-year period on record for the historical period from 1980 to 2019, with an average precipitation of 4.44 inches per year.

Figure 7-2. Deviation of Annual Rainfall from Long-Term Average



Source: PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu

As discussed in Section 7.1.1, purchased water from the City of Bakersfield is 100 percent reliable regardless of water year type, and purchased water from ID-4 is reliable during normal hydrologic conditions. In case of any purchased water supply shortages, groundwater supply will be used to serve any remaining projected demand that is not met with purchased water supplies. Therefore, total supplies from both purchased water and groundwater are expected to be sufficient to meet projected water demands of the District under all hydrologic conditions, including in normal, single dry, and multiple dry years.

As such, the projected "volume available" estimates presented in Table 7-1 are equal to the maximum demands across projected years and year types shown in Table 7-2, Table 7-3, and Table 7-4. For example, the assumed volume available in a representative single dry year in Table 7-1 is equal to the projected single dry year demand for the year 2045 as shown in Table 7-3.

It should be noted that supply volumes in Table 7-1, Table 7-2, Table 7-3, and Table 7-4 do not represent the total amount of purchased water and groundwater supply that may be available to the District in a given year, but rather reflect the fact that the combination of available purchased water and groundwater supply sources has always been sufficient to meet demands, and is projected to continue to be sufficient to meet demands in the future. It should also be noted that the Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

Table 7-1. Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
			Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		X	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	2017	70,314	
Single-Dry Year	2008	71,592	
Consecutive Dry Years 1st Year	2011	72,382	
Consecutive Dry Years 2nd Year	2012	72,382	
Consecutive Dry Years 3rd Year	2013	72,382	
Consecutive Dry Years 4th Year	2014	72,382	
Consecutive Dry Years 5th Year	2015	72,382	

NOTES:
(a) Volumes are in units of AF.
(b) As discussed in Section 7.1, total supplies are considered to be equal to the projected demand under all year types. Therefore, available volumes presented here are the maximum demands across projected years in Table 7-2, 7-3, and 7-4.

7.3 Supply and Demand Assessment

Water supply and demand patterns change during normal, single dry, and multiple dry years. Cal Water has relied on the demand modeling described in Chapter 4 to forecast demands for normal, single dry and multiple dry years. As described above, Cal Water's groundwater supply for the Bakersfield District is expected to be able to serve those demands in all year types through 2045.[57]

Table 7-2 shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in Table 6-9 and Table 4-3, respectively. Table 7-3 shows the projected supply and demand totals for the single dry year, and Table 7-4 shows the projected supply and demand totals for multiple dry year periods extending five years. It should be noted that the supply values shown in Table 7-2 through Table 7-4 do not represent the total supply available to the District in a given year, but rather reflect the fact that the available purchased water and groundwater supplies are sufficient to meet the demands as needed. It should also be noted that the Kern County Subbasin is not adjudicated, and the projected supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

Table 7-2. Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply totals *From DWR Table 6-9*	60,439	62,681	65,408	67,871	70,314
Demand totals *From DWR Table 4-3*	60,439	62,681	65,408	67,871	70,314
Difference	0	0	0	0	0

NOTES:
(a) Volumes are in units of AF.
(b) The Kern County Subbasin is not adjudicated, and this projected supply volumes, which include groundwater, do not comprise a determination of water rights or maximum allowable pumping.

[57] The balance between supply and demand totals excludes usage reductions that are not directly a function of Cal Water supplies, but are externally-imposed by other entities, such as the 2015 State-mandated cutbacks.

Table 7-3. Single Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045
Supply totals	61,520	63,807	66,588	69,100	71,592
Demand totals	61,520	63,807	66,588	69,100	71,592
Difference	0	0	0	0	0

NOTES:
(a) Volumes are in units of AF.
(b) The Kern County Subbasin is not adjudicated, and this projected supply volumes, which include groundwater, do not comprise a determination of water rights or maximum allowable pumping.

Table 7-4. Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045
First year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0
Second year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0
Third year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0
Fourth year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0
Fifth year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0

NOTES:
(a) Volumes are in units of AF.
(b) The Kern County Subbasin is not adjudicated, and this projected supply volumes, which include groundwater, do not comprise a determination of water rights or maximum allowable pumping.

7.4 Water Supply Management Tools and Options

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

Cal Water coordinates on an ongoing basis with all relevant agencies in the region to optimize the use of regional water supplies. This includes City of Bakersfield, the relevant GSAs, ID-4, and other public and private entities with which Cal Water can collaborate to protect and enhance local groundwater and surface water resources.

Cal Water is currently in the process of developing multiple regional water supply reliability studies using integrated resource planning practices to create a long-term supply reliability strategy through 2050 for Cal Water districts throughout California. The studies will create long-term strategies to address a wide range of water supply challenges including climate change, new regulatory requirements (e.g., SGMA), and potential growth in demands due to new development. These water supply reliability studies will be completed on a rolling basis over the next several years, with all studies anticipated to be complete by 2024. The Bakersfield District will be included in the Central Valley Water Reliability Study.

Cal Water also has its own aggressive and comprehensive water conservation program that has and will continue to reduce per-capita usage and therefore demands on critical water sources. Cal Water is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in the most cost-effective manner possible, Cal Water routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the UWMP. Cal Water's Conservation Master Plan provides the basis for the information on the implementation of and expected water savings from Demand Management Measures (DMMs) presented in Chapter 9.

Cal Water also monitors and supports the goals of the Kern Integrated Regional Water Management Plan (IRWMP).

7.5 Drought Risk Assessment

☑ ***CWC § 10635(b)***

Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

7.5.1 Data, Methods, and Basis for Water Shortage Condition

This drought risk assessment considers the effects on available water supply sources of a five-year drought commencing the year after the assessment is completed, i.e., from 2021 through 2025. This evaluation considers historical drought hydrology and plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria. In the Bakersfield District, the supply source is a combination of purchased water and groundwater. As such, the same data, methodology, and basis for the conclusions of the above water supply sufficiency analysis for multiple dry year periods through 2045 holds true for purposes of this drought risk assessment (i.e., supply availability through 2025). Accordingly, as shown in Table 7-5 of the Plan, the purchased water and groundwater supply is expected to be able to meet the projected demands through 2025, even if there is a five-year drought.

7.5.2 Drought Risk Assessment Water Source Reliability

As described in Chapter 6, purchased water and groundwater are the sources of water supply for the Bakersfield District. Based on discussion in Section 7.1.1, the Bakersfield District purchased water and groundwater supplies are expected to be sufficient to meet demands in all hydrologic conditions, including an extended five-year drought period.

As described in Sections 4.3 and 6.10.1 of this Plan, the impacts on climate change have already been factored into the District's demand projections and the analysis of the near- and longer-term reliability of the groundwater supply source available to the District.

Regulatory conditions that could affect future water supply availability and project development (e.g., related to the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary [Bay-Delta Plan]) are discussed in Section 6.10.3 of the Plan. However, the District does not currently have plans for projects to develop additional supply sources, and so these regulatory conditions will be assessed in future UWMP updates if or when the District moves forward with any plans to develop supply projects.

Implementation of SGMA in the Kern County Subbasin is a locally applicable consideration for the Bakersfield District. As discussed in Section 6.2.3 of this Plan, the long-term impacts of SGMA implementation in the Kern County Subbasin are still uncertain. However, it is the intent of the projects and management actions planned by the within the Basin to stabilize water levels and provide for sustainable management of the groundwater resource. It is anticipated that should pumping fees or similar restrictions (i.e., allocations) be required to address future shortfalls, such actions will be focused on management of agricultural water use, as opposed to M&I pumping. As such actions are implemented, Cal Water will consider them as a part of its future supply planning efforts.

Cal Water holds certain water rights to groundwater it has pumped and used as an overlying owner and appropriator. Cal Water's water rights have been dedicated to a public use, and Cal Water is required by the CPUC to provide water to all customers within its designated service area under reasonable rules and regulations. Further, under California law municipal water rights and uses have a higher priority and are entitled to more protection than other uses of water, including in connection with SGMA. Use of water for domestic purposes is recognized as the "highest use" of water in the State of California pursuant to CWC §106, and the rights of urban water purveyors should be protected to the fullest extent necessary for existing and future uses, pursuant to CWC §106.5.

SGMA was intended to preserve the security of water rights in the state to the greatest extent possible, and was not intended to determine, modify or alter any surface water or groundwater rights or priorities. (CWC §10720.1(b), 10720.5(a) and (b).) SGMA should therefore not reduce, adversely impact or limit Cal Water's present or future exercise of its domestic water rights or its obligation to serve its municipal customers, and Cal Water's rights should be subject to less restrictions and limitations than any other types of water rights or uses.

Table 7-5 provides a comparison of the water supply sources available to the Bakersfield District with the total projected water use for an assumed drought period of 2021 through 2025. This includes current climate change conditions. It should be noted that the supply values shown in the table do not represent the total supply available to the District in a given year, but rather

reflect the fact that the available purchased water and groundwater supplies are sufficient to meet the demands as needed. It should also be noted that the Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

In general, the District has sufficient supplies to meet demands in all year types. However, Cal Water has developed a WSCP (Appendix G) to address potential water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, etc.). The WSCP, included as Appendix G, identifies a variety of actions that Cal Water will implement to reduce demands and further ensure supply reliability at various levels of water shortage.

Table 7-5. Five-Year Drought Risk Assessment Tables (DWR Table 7-5)

2021	Total
Total Water Use	60,965
Total Supplies	60,965
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	

2022	Total
Total Water Use	61,217
Total Supplies	61,217
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	

Table 7-5. Five-Year Drought Risk Assessment Tables (DWR Table 7-5)

2023	Total
Total Water Use	61,503
Total Supplies	61,503
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	

2024	Total
Total Water Use	61,809
Total Supplies	61,809
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	

2025	Total
Total Water Use	62,188
Total Supplies	62,188
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	

NOTES:
(a) Volumes are in units of AF.
(b) In general, the District has sufficient supplies to meet demands in all year types and it is not anticipated that WSCP actions will be required in the District during the drought period. However, during state, regional, or extreme circumstances, the WSCP would be implemented to reduce demand.

Chapter 8
Water Shortage Contingency Planning

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

The Water Shortage Contingency Plan (WSCP) for the Bakersfield District (also referred to herein as "District") is included in this Urban Water Management Plan (UWMP) as Appendix G The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. Consistent with CWC §10632, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage, identifies a suite of demand mitigation measures for the District to implement at each level, and identifies procedures for the District to annually assess whether or not a water shortage is likely to occur in the coming year, among other things.

A summary of the key elements of the WSCP including water shortage levels and demand-reduction actions is shown in Table 8-1, Table 8-2, and Table 8-3. Additional details are provided in Appendix G.

Table 8-1. Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Demand reduction (See Table 8-2)
2	Up to 20%	Demand reduction (See Table 8-2)
3	Up to 30%	Demand reduction (See Table 8-2)
4	Up to 40%	Demand reduction (See Table 8-2)
5	Up to 50%	Demand reduction (See Table 8-2)
6	>50%	Demand reduction (See Table 8-2)
NOTES:		

Table 8-2. Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
1	Other	8%	1. Limit landscape irrigation to specific times 2. Customers must repair leaks, breaks, and malfunctions in a timely manner 3. Restrict or prohibit runoff from landscape irrigation 4. Prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall 5. Prohibit use of potable water for washing hard surfaces 6. Lodging establishments must offer opt out of linen service 7. Require shut-off nozzles on hoses for vehicle washing with potable water 8. Restaurants may only serve water upon request 9. No watering of landscape of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission, and the Department of Housing and Community	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
			Development, or other state agency 10. Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	
1	Other	--	1. Expand Public Information/Media Campaign 2. Water Bill Inserts 3. Promote online water waste reporting 4. Expand Rebates or Giveaways of Plumbing Fixtures and Devices 5. Expand Rebates for Landscape Irrigation Efficiency 6. Expand CII Water Use Surveys 7. Expand Res Water Use Surveys	No
2	Other	14%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Prohibit the use of non-recirculating systems in all new conveyer car wash and commercial laundry systems 3. Prohibit the use of single pass cooling systems in new connections 4. No watering of landscape of newly constructed homes and buildings in a	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
			manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development 5. Landscape - Limit landscape irrigation to 1-3 days/week	
2	Other	--	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Water Efficiency Workshops, Public Events 3. Offer Water Use Surveys 4. Provide Rebates or Giveaways of Plumbing Fixtures and Devices 5. Provide Rebates for Landscape Irrigation Efficiency	No
3	Other	28%	1. Continue with Stage 2 restrictions and prohibitions except where superseded by more stringent actions. 2. Landscape - Prohibit irrigation of ornamental turf on public street medians with potable water 3. Prohibit Filling Ornamental Lakes or Ponds 4. Prohibit use of potable water for	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
			construction and dust control 5. Prohibit use of potable water for street washing	
3	Other	--	1. Continue with Stage 2 actions except where superseded by more stringent actions. 2. Home or Mobile Water Use Reports 3. Decrease Frequency and Length of Line Flushing 4. Reduce System Water Loss 5. Increase Water Waste Patrols/Enforcement 6. Implement Drought Rate Structure and Customer Water Budgets (Res) 7. Implement Drought Rate Structure and Customer Water Budgets (CII)	No
4	Other	37%	1. Continue with Stage 3 restrictions and prohibitions except where superseded by more stringent actions. 2. Prohibit vehicle washing except with recirculated water or low-volume systems 3. Prohibit use of water for recreational purposes such as water parks and the filling of pools	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
4	Other	--	1. Continue with Stage 3 actions except where superseded by more stringent actions. 2. Promote / Expand Use of Recycled Water	No
5	Other	47%	1. Continue with Stage 4 restrictions and prohibitions except where superseded by more stringent actions. 2. Require net zero demand Increase on new water service connections 3. Prohibit single-pass cooling systems	Yes
5	Other	--	1. Continue with Stage 4 actions except where superseded by more stringent actions. 2. Require Pool Covers	No
6	Other	56%	1. Continue with Stage 5 restrictions and prohibitions except where superseded by more stringent actions. 2. Moratorium on new water service connections 3. Prohibit all landscape irrigation	Yes
NOTES:				

Table 8-3. Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*
NOTES:			

Chapter 9
Demand Management Measures

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

This chapter presents a summary of past and planned demand management measure (DMM) implementation in the Bakersfield District (also referred to as the "District"), as well as an overview of the expected water savings.

This chapter has the following sections:

9.1 Demand Management Measures for Wholesale Agencies

9.2 Demand Management Measures for Retail Suppliers

9.3 Implementation over the Past Five Years

9.4 Implementation to Achieve Water Use Targets

9.5 Water Use Objectives (Future Requirements)

9.1 Demand Management Measures for Wholesale Agencies

Because the District is a retail water supplier, this section does not apply.

9.2 Demand Management Measures for Retail Suppliers

California Water Service Company (Cal Water) centrally administers its conservation programs for all the districts it operates. For purposes of this section, these programs have been grouped in accordance with the DMM categories in CWC §10631(e). These categories are:

(i) Water waste prevention ordinances
(ii) Metering
(iii) Conservation pricing
(iv) Public education and outreach
(v) Programs to assess and manage distribution system real loss
(vi) Water conservation program coordination and staffing support, and
(vii) Other demand management measures

Following are descriptions of the conservation programs Cal Water operates within each of these DMM categories. The District's Conservation Master Plan, provided in Appendix H, contains additional information on Cal Water's conservation programs.

9.2.1 Water Waste Prevention Ordinances

Cal Water's enforcement of water waste prevention and water use restrictions is authorized and overseen by the California Public Utilities Commission via Rule 14.1 or Schedule 14.1. Local government in districts operated by Cal Water may also adopt ordinances regulating water use. Cal Water coordinates its efforts to prevent water waste with the appropriate local governmental entities. For the Bakersfield District, this includes the City of Bakersfield and Kern County.

Rule 14.1 defines the District's Water Shortage Contingency Plan (WSCP, Appendix H), including its prohibitions on water waste and restrictions on water use. Prohibitions include:

- Use of potable water through a broken or defective plumbing fixture or irrigation system when Cal Water has notified the customer in writing to repair the broken or defective plumbing fixture or irrigation system, and the customer has failed to effect such repairs within seven (7) business days of receipt of such notice.
- The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.
- The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is

fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

Restrictions on water use during shortages include, but are not necessarily limited to:

- Outdoor irrigation restrictions in terms of time of day and weekly frequency.
- Obligations to fix leaks, breaks, or malfunctions within five (5) business days of written notification by Cal Water.
- Application of potable water to driveways and sidewalks.
- The use of potable water in a water feature, except where the water is part of a recirculating system.
- The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall.
- The serving of drinking water other than upon request in eating or drinking establishments.
- Irrigation of ornamental landscape on public street medians.
- Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
- Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.
- Limits on filling ornamental lakes or ponds.
- Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes.
- Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

9.2.2 Metering

☑ ***CWC § 526 (a)***

Notwithstanding any other provision of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract … shall do both of the following:

(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, located within its service area.

(2) On and after March 1, 2013, or according to the terms of the Central Valley Project water contract in operation, charge customers for water based on the actual volume of deliveries, as measured by a water meter.

☑ ***CWC § 527 (a)***

(a) An urban water supplier that is not subject to Section 526 shall do both of the following:

(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.

All non-residential services in the District are metered. The District is in the process of converting all residential services to meters. As of 2020, there were 6,929 residential services that had yet to be converted. These services are scheduled for conversion by the end of 2024. All service connections within the District will be metered by January 1, 2025. Meters are read monthly and routinely maintained and calibrated. Customers are billed monthly based on their metered water use.

Cal Water is also piloting automatic meter reading (AMR) and advanced metering infrastructure (AMI) in several of its districts. AMI may be used by Cal Water in the future to detect and alert households of leaks and other possible problems as well as to provide customers with tailored water use information to help them use water more efficiently.

9.2.3 Conservation Pricing

The CPUC reviews and authorizes District water rates in a General Rate Case every three years. Currently, the District uses a three-tier increasing block rate design for residential water use and a single-tier uniform rate design for non-residential use. The District provides rate assistance to lower income households through its Customer Assistance Program (CAP).

9.2.4 Public Education and Outreach

The District's public outreach program is divided into four components, as follows:

Residential Customer Assistance – This category provides tailored assistance to residential customers through home water surveys and monthly water use reports. It provides assistance to residential customers wanting to reduce their indoor and outdoor water uses. While available to all residential customers, marketing of home water surveys is generally focused on high use residential customers.

Non-Residential Customer Assistance – This category provides tailored assistance to commercial customers through commercial water surveys, monthly landscape reports to large landscape customers, and large landscape water use surveys. It provides assistance to commercial customers wanting to reduce their use of water for sanitation, hygiene, process, and landscape purposes.

Public Information and School Education – Cal Water's public information program provides general information on the need for and value and methods of water conservation through multiple media outlets, including its website, direct mail, and external print media. Cal Water's school education program includes the Cal Water H2O Challenge (a project-based learning competition for grades 4-6), Cal Water Town (an interactive online learning tool), and general information and learning materials for students and teachers.

Rebate Program Information and Marketing – Through its website, bill inserts, newsletters, and print media, Cal Water advertises and markets a variety of conservation rebate programs, including rebate programs for high-efficiency toilets, urinals, and clothes washers, and irrigation equipment and landscape efficiency improvements.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

Cal Water took part in the California Water Loss Technical Assistance Program (TAP) in 2016 and 2017. Cal Water conducts regular distribution system audits using the American Water Works Association (AWWA) Free Water Audit Software. Cal Water is developing a Water Loss Control Optimization Plan and Water Loss Control Policy to guide future water loss management and has solicited technical support with respect to:

- Satisfying current and future CPUC and state water loss standards and regulations
- Improving audit data and validity scores
- Implementing cost-effective water loss control actions

Recently, Cal Water has created a Water Loss Program Analyst position to coordinate and oversee these activities.

9.2.6 Water Conservation Program Coordination and Staffing Support

Cal Water's conservation programs are centrally administered by a team of conservation professionals. Conservation staffing levels and positions are reviewed and authorized by the California Public Utilities Commission in General Rate Cases every three years. The currently authorized conservation program staffing consists of nine full-time positions, which include:

- Director of Water Resource Sustainability,
- Conservation Program Manager,
- Research, Analytics and Reporting Manager,
- Water Resource Sustainability Analyst,
- Water Loss Program Analyst,
- Three Conservation Program Coordinators, and
- Conservation Assistant.

These staff positions manage all aspects of Cal Water's conservation programs deployed across 24 separate districts serving a combined population of 1.8 million people through half a million service connections.

9.2.7 Other Demand Management Measures

In addition to the DMM programs described above, Cal Water operates rebate, give-away, and direct installation programs aimed at plumbing fixture replacement and irrigation equipment and landscape efficiency improvements. Following are brief descriptions of each of these DMMs.

MaP Premium and Non-Premium Toilet Replacement – This program replaces old toilets with MaP certified high-efficiency toilets. Financial rebates, direct installation, and direct distribution are used to deliver toilets to customers. For residential customers, MaP premium certified toilets, which have greater water savings potential, are eligible for a rebate up to $50. For commercial customers, a rebate up to $100 is available for valve-type toilets flushing 1.28 gallons or less and EPA WaterSense labeled tank-type toilets. Cal Water centrally administers the program. This program is available to all residential and non-residential customers. Cal Water markets the program through direct mail, print media, bill stuffers, and its website. Where advantageous, Cal Water partners with local or regional agencies and community organizations to offer the program.

Urinal Valve and Bowl Replacement – This program replaces old urinals with high-efficiency urinals meeting the 0.125 gallon per flush water use standard adopted by the California Energy Commission in April 2015. Rebates up to $150 are available to customers. The program targets offices and public buildings receiving significant foot traffic. Cal Water centrally administers the program. While this program is available to all non-residential customers, marketing focuses on

prime targets, such as restaurants and high-density office buildings. Cal Water markets the program through direct mail, print media, bill stuffers, and its website.

Clothes Washer Replacement – This program provides customer rebates up to $150 for residential high-efficiency clothes washers. The program targets single-family households, multi-family units, and multi-family common laundry areas. Cal Water centrally administers the program, and markets the program through direct mail, print media, bill stuffers, and its website. This program is available to all residential customers. Where advantageous, Cal Water partners with local or regional agencies to offer the program.

Residential Conservation Kit Distribution – This program offers Cal Water residential customers conservation kits featuring a range of water-saving plumbing retrofit fixtures. Kits are available at no charge to customers, who can request them via Cal Water's website, via mail, or by contacting or visiting their district offices. Each kit includes the following items: high-efficiency showerheads, kitchen faucet aerator, bathroom faucet aerators, full-stop hose nozzle, and toilet leak detection tablets. Cal Water centrally administers this program as part of a company-wide program operated in each of its districts. This program is available to all residential customers. Cal Water markets the program through direct mail, print media, bill stuffers, and through its website.

Smart Controllers Rebates/Vouchers – This program targets residential and non-residential customers with high landscape water use. The program offers financial incentives up to $125 for residential controllers and up to $25 per station for commercial-grade controllers to either the customer or contractor for proper installation of the Smart Controller at customer sites. The landscape contractor has the direct relationship with customers and is typically the entity customers listen to when making landscape and irrigation decisions. The program educates contractors about the customer benefits of Smart Controllers along with proper installation of the devices. This program is offered to all residential and non-residential customers. Cal Water markets the program through direct mail, print media, bill stuffers, and its website.

High Efficiency Irrigation Nozzle Web Vouchers/Rebates – Water efficient sprinkler nozzles (popup and rotating) and integrated pressure-regulated spray bodies use significantly less water than a standard sprinkler head by distributing water more slowly and uniformly to the landscape. In addition to reducing water use, water directed from these nozzles reduces run-off onto streets and sidewalks with a more directed flow. Customers are able to obtain the nozzles and spray bodies either directly through Cal Water or via a web-voucher program. Restrictions on the number of nozzles individual customers may receive vary by customer class and/or landscape size. Cal Water centrally administers this program as part of a company-wide program operated in most of its districts.

Turf Buy-Back – This program offers customers a $1 per square foot rebate to replace turf with qualified drought-tolerant landscaping. Customer applications are screened to ensure program

requirements are met, including before and after photos of the retrofitted landscape area. Turf replacement rebates were offered in a subset of Cal Water districts starting in 2014 and offered across all districts starting in 2015 as a drought response measure. Implementation of this DMM was authorized by the California Public Utilities Commission to resume in 2021.

Table 9-1 summarizes the DMMs available to District customers at the time this Urban Water Management Plan (UWMP or Plan) was prepared.

Table 9-1. Cal Water DMMs Available to District Customers

DMM Measures (Rebate, Direct Install, and Free Distribution Programs)	Use Type Eligibility		
	Single-Family Residential	Multi-Family Residential	Commercial
Indoor Programs			
MaP Premium Toilet	✓	✓	✓
Urinal Bowl & Valve (< 0.125 gal)			✓
Clothes Washer (In Unit)	✓	✓	
Conservation Kits (showerheads, aerators)	✓		✓
Outdoor Programs			
Smart Irrigation Controller	✓	✓	✓
High Efficiency Irrigation Popup Nozzle	✓	✓	✓
High Efficiency Irrigation Rotating Nozzle	✓	✓	✓
High Efficiency Irrigation Spray Body		✓	✓
Turf Buy-Back	✓	✓	✓
Residential Assistance Programs			
Residential Water Survey	✓	✓	
Non-Residential Assistance Programs			
Commercial Water Use Surveys			✓
Monthly Water Use Report			✓
Large Landscape Water Use Survey			✓

9.3 Implementation over the Past Five Years

Table 9-2 summarizes program implementation for the previous five years. Estimated water savings do not include savings from water waste prevention ordinances, conservation pricing, public information, or distribution system water loss management. Cal Water uses the Alliance for Water Efficiency's Water Conservation Tracking Tool to estimate water savings.

Table 9-2. Implementation of Customer DMMs: 2016-2020

Indoor Programs	2016 – 2020 Total	Average Annual
Toilets & Urinals (number distributed)	3,616	723
Clothes Washers (number distributed)	434	87
Conservation Kits (number distributed)	1,506	301
Outdoor Programs		
Smart Controllers (number distributed)	617	123
Nozzles & Spray Bodies (number distributed)	14,703	2,941
Turf Buy-Back (sq ft removed)	29,316	5,863
Residential Assistance Programs		
Surveys/Audits (homes receiving)	141	28
Non-Residential Assistance Programs		
Surveys/Audits (sites receiving)	15	3
Large Landscape Reports (sites receiving)	179	36
Estimated Water Savings (AF)	1,105	221
NOTES: Estimated water savings for 2016-2020. DMMs will continue to generate savings after 2020 for their useful life.		

9.4 Implementation to Achieve Water Use Targets

All the DMMs described above contributed to the District's compliance with its SB X7-7 2020 target GPCD.

9.5 Water Use Objectives (Future Requirements)

CWC §10609 requires that urban retail water suppliers develop new water use objectives that are based on specific standards for certain water use sectors. These water use objectives will not be developed until 2023. Suppliers are encouraged in this UWMP cycle to consider how they will align their conservation management actions in order to meet these future obligations.

As noted above, Cal Water's conservation programs are subject to review and approval by the CPUC through a General Rate Case every three years. In making conservation program recommendations to the CPUC, Cal Water carefully considers how they will advance multiple objectives, including compliance with the pending water use objectives. Specific objectives identified in Cal Water's most recent General Rate Case included:

- Maintaining continuity with and furthering implementation of conservation programs authorized by the previous General Rate Case.

- Preserving gains in water conservation achieved during the 2013-2017 drought.
- Ensuring Cal Water districts are well-positioned to comply with state regulations and policies pertaining to water conservation, water loss management, and groundwater management, including Executive Order B-37-16, SB 555, and the Sustainable Groundwater Management Act (SGMA).
- Advancing cost-effective water use efficiency alternatives in districts with high water supply costs.

Cal Water developed a scoring methodology to adjust conservation programs and budgets to further these objectives. The methodology specifically considers five distinct conservation policy drivers:

1. State Conservation Standards and Water Use Objectives
2. SGMA Compliance
3. SB 555 Water Loss Management Requirements
4. Commercial, Institutional, and Industrial (CII) Water Management
5. Avoided Water Cost and Affordability

The methodology assigns greater weight to the State Conservation Standards and Water Use Objectives and SGMA Compliance policy drivers, reflecting their importance in terms of overall water resources management.

Scoring for the SGMA Compliance policy driver is based on groundwater basin priority, district dependence on groundwater supply, and basin adjudication status. The highest scores are assigned to districts in unadjudicated and critically overdrafted or high priority basins where groundwater comprises more than 45 percent of the water supply. The Bakersfield District ranked in the top third of Cal Water's districts for this policy driver.

Scoring for the State Conservation Standards and Water Use Objectives policy driver is based on four metrics that are used to gauge which districts are most likely to require adjustments to their conservation program mix or level of implementation to comply with the new standards. These metrics are:

1. Residential per capita landscape area
2. Residential per capita turf area
3. Size and number of large residential landscapes
4. Difference between a simulated water use budget and average water use for 2011-15

The Bakersfield District ranked in the middle third of Cal Water's districts for this policy driver.

Scoring for the SB 555 Water Loss Management Requirements policy driver is based on the district's infrastructure leakage index (ILI) from its most recent validated water loss audit. The ILI

is a performance indicator of real (physical) water loss from the water distribution system. A high ILI indicates possible distribution system inefficiencies and may also indicate significant water system leakage. Proposed adjustments to funding for water loss management are based on the ILI scoring criteria. The Bakersfield District ranked in the middle third of Cal Water's districts for this policy driver.

Scoring for the CII Water Management policy driver is based on the ratio of CII water uses to total water uses in a district. The Bakersfield District ranked in the top third of Cal Water's districts for this policy driver.

Scoring for the Avoided Water Cost and Affordability policy driver is based on the District's avoided cost of water supply, as estimated by the California Urban Water Conservation Council (CUWCC)/Water Research Foundation Avoided Cost Model. The Bakersfield District ranked in the bottom third of Cal Water's districts for this policy driver.

The combination of scores on each policy driver were used by Cal Water to recommend to the CPUC in its most recent General Rate Case adjustments to the conservation budgets of its districts. The purpose of the adjustments is to increase Cal Water's capacity to deploy conservation programs in districts expected to face the most significant regulatory and water management challenges in coming years. Recommended adjustments ranged from a low of 5 percent to a high of 25 percent. The recommended adjustment for the Bakersfield District was 22.5 percent.

Chapter 10
Plan Adoption, Submittal, and Implementation

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

This chapter provides information on a public hearing, the adoption process for the Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP or WSCP. This chapter includes the following sections:

10.1 Inclusion of All 2020 Data

10.2 Notice of Public Hearing

10.3 Public Hearing and Adoption

10.4 Plan Submittal

10.5 Public Availability

10.6 Notification of Public Utilities Commission

10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

10.1 Inclusion of All 2020 Data

This UWMP includes the water use and planning data for the entire calendar year of 2020, per the UWMP Guidebook 2020.

10.2 Notice of Public Hearing

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

Prior to adopting the Plan, California Water Service Company (Cal Water) held a virtual public hearing to present information on its Bakersfield District (also referred to herein as the "District") 2020 UWMP and WSCP on June 1, 2021, 7:00 PM.[58]

Relevant entities were notified of the UWMP and WSCP review at least 60 days prior to the public hearing, including: (1) cities, counties, and Groundwater Sustainability Agencies (GSAs), and (2) the public. These entities were noticed again with the specific date, time and location of the hearing at least two weeks prior to the public hearing. The notice to the public, as specified in Government Code 6066, and letters to relevant agencies can be found in Appendix B and Appendix C, respectively.

10.2.1 Notice to Cities and Counties

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

Table 10-1 lists the cities and counties that were notified. Copies of these letters are provided in Appendix B.

[58] Restrictions related to the COVID-19 pandemic prevented the District from holding an in-person public hearing as previously planned.

Table 10-1. Notification to Cities and Counties (DWR Table 10-1)

City Name	60 Day Notice	Notice of Public Hearing
City of Bakersfield	X	X
County Name	**60 Day Notice**	**Notice of Public Hearing**
Kern County	X	X
Other Agency Name	**60 Day Notice**	**Notice of Public Hearing**
Kern County Water Agency	X	X
Kern Delta Water District	X	X
Kern River Groundwater Sustainability Agency	X	X
NOTES:		

10.2.2 Notice to the Public

Notification to the public and to cities and counties also provided instructions on how to view the 2020 UWMP and WSCP prior to the hearing, the revision schedule, and contact information of the UWMP and WSCP preparer. A copy of this notice is included in Appendix C.

10.3 Public Hearing and Adoption

☑ ***CWC § 10608.26***

(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

The deadline for public comments on the UWMP and WSCP was June 1, 2021, the day of the public hearing. The final Plan was formally adopted by Cal Water's Vice President of Engineering June 20, 2021, and was submitted to California Department of Water Resources (DWR) within 30 days of approval. Appendix I presents a copy of the signed Resolution of Plan Adoption. Appendix B contains the following:

- Letters sent to and received from various agencies regarding this plan, and
- Correspondence between Cal Water and participating agencies.

10.4 Plan Submittal

☑ ***CWC § 10621 (f)***

(1) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

☑ ***CWC § 10635 (c)***

The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

☑ ***CWC § 10644 (a)***

(1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

This UWMP and WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline. The submittal was done electronically through Water Use Efficiency Data Portal, an online submittal tool. The adopted UWMP and WSCP was also sent to the California State Library and to the cities and counties listed in Table 10-1 no later than 30 days after adoption.

10.5 Public Availability

☑ ***CWC § 10645***

(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

On or about May 3, 2021, an electronic version of the draft 2020 UWMP and WSCP were made available for review by visiting Cal Water's website: https://www.calwater.com/conservation/uwmp-review/.[59]

10.6 Notification of Public Utilities Commission

☑ ***CWC § 10621 (c)***

An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.

Cal Water is an urban water supplier regulated by the California Public Utilities Commission. Cal Water included the District's 2020 UWMP and WSCP as part of its general rate case filings.

10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

☑ ***CWC § 10644 (b)***

If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

If the 2020 UWMP or WSCP is amended, each of the steps for notification, public hearing, adoption and submittal will also be followed for the amended document.

[59] Restrictions related to the COVID-19 pandemic prevented the District from making a printed hard-copy available for public review as previously planned.

Appendix A: UWMP Act Checklist

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Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Chapter 1
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Section 1.6
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.4 and Table 2-1
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5 and Table 2-4
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.5
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.5.1
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Chapter 3
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4 and Table 3-1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4 and Table 3-2
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Setion 3.4 and Table 3-2
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.5
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2 and Tables 4-1 to 4-3
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2.3
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 4.2.4 and Tables 4-5 and 4-6
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.4
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.2.3 and Table 4-4
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.2.5 and Table 4-7
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 7.5.1
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.5 and Table 5-2
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.4
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.4
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Section 5.5
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Chapter 7
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Section 7.2
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.9 and Table 6-9
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.8
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.9
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.1
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years.	System Supplies	Section 6.2.5 and Table 6-1
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.9
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2 and Tables 6-4 and 6-5
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-5
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.3
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-4
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-6
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.5.2 and Table 6-3
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8 and Table 6-7
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.11 and Table 6-10
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability.	Water Supply Reliability Assessment	Section 7.1.2
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.2 and Tables 7-2 to 7-4
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.5
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.5
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.5 and Table 7-5
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.5
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Appendix G
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision- making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix G

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix G
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix G
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix G

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Water Shortage Contingency Planning	Appendix G
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix G
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix G
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Section 10.4
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Chapter 9
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Chapter 10
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2.1
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	Section 10.6
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.7

Appendix B: Correspondence

- UWMP Notice of Preparation
- District Mailing List
- Growth Projection and Land Use Letter
- UWMP and WSCP Public Draft Comments

Note: There were no public comments received on the UWMP or WSCP Public Draft.

Notice of Preparation of Urban Water Management Plan and Water Shortage Contingency Plan - 2020 Update

The Urban Water Management Planning Act (California Water Code §10608–10656) requires that California Water Service (Cal Water) update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years.

Cal Water is currently reviewing its existing UWMP and associated WSCP, which were updated in 2016, and considering revisions for each plan. Coordination with other water suppliers, cities, counties, and community organizations in the region is an important part of the preparation of Cal Water's UWMP and WSCP. We are available to discuss the assumptions used in the development of the plans including available water supply, water demands, land use, as well as other aspects of the plans.

A draft of the 2020 UWMP and WSCP will be made available for public review and a public hearing will be scheduled in Spring 2021. We will notify you when the draft is available for review, how to access it, and details regarding the public hearing.

The updated UWMP and WSCP are due by July 1, 2021. If you would like more information regarding our 2015 UWMP and WSCP and the schedule for updating these documents, or if you would like to participate in the preparation of the 2020 UWMP and WSCP, please contact:

Michael Bolzowski
Senior Engineer
California Water Service
Phone: (408) 367-8338
Email: PlanningInfo@calwater.com

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Council Member
City of Bakersfield
city_council@bakersfieldcity.us

Karen Goh
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Lorelei Oviatt
Planning Director
Kern County, Planning Department
LoreleiO@co.kern.ca.us

Bolzowski, Michael R.

From: Storms, Maximilian (Max)
Sent: Wednesday, May 19, 2021 11:25 AM
To: nfidler@bakersfieldcity.us; pjohnson@bakersfieldcity.us; achianel@bakersfieldcity.us
Cc: McCusker, Kevin; Johnson,Tamara; PlanningInfo
Subject: California Water Service 2020 Bakersfield UWMP - Public Draft
Attachments: Bakersfield (CBK) - Cal Water UWMP_Land Use Coordination.pdf

To Whom It May Concern:

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect water service conditions in the Bakersfield District. The Bakersfield District serves portions of the City of Bakersfield and segments of unincorporated Kern County.

The State requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an UWMP and WSCP at least once every five years. These documents support Cal Water's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions.

Cal Water's estimates of future water demands are based on demographic projections and current and projected land use forecasts. For the Bakersfield District, Cal Water's water demand forecast is tied to Census Block population counts from decadal Census data. The decadal Census estimates are converted to average population per single- and multi-family service, which are applied to service counts for years between the decadal Censuses. Projected population is based on population and employment forecasts for Kern County generated by the California Department of Transportation's (Caltrans) long-term socio-economic forecast model.

The UWMP also incorporates water supply assessments (WSA) for projects in or near the Bakersfield District into the demand forecast. As additional large-scale projects and/or specified land use planning processes arise (e.g., general plans, specific plans), additional WSAs will be developed to consider their impacts on available supplies.

We have attached the current public review draft of the UWMP, and incorporated WSCP for your review. Please share this with others in your organization that may be interested in the information.

Cal Water is available to discuss the assumptions used in the development of the UWMP for the Bakersfield District, including available supply, water demands, land use, as well as any other aspects of the plan.

Should you have any questions or comments, please contact Michael Bolzowski at mbolzowski@calwater.com.

Sincerely,



Michael B. Hurley
Water Resources Manager

Bolzowski, Michael R.

From: Storms, Maximilian (Max)
Sent: Wednesday, May 19, 2021 11:25 AM
To: LoreleiO@co.kern.ca.us
Cc: McCusker, Kevin; Johnson,Tamara; PlanningInfo
Subject: California Water Service 2020 Bakersfield UWMP - Public Draft
Attachments: Bakersfield (Kern Co) - Cal Water UWMP_Land Use Coordination.pdf

Ms. Oviatt,

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Should you have any questions or comments, please contact Michael Bolzowski at mbolzowski@calwater.com.

Sincerely,



Michael B. Hurley
Water Resources Manager

Appendix C: Public Meeting Notice

- Public Meeting Notice of Intent
- Proof of Publication
- Public Meeting Presentation

Good afternoon!

We hope that this note finds you well.

We wanted to provide you with an update on the preparation of our updated Urban Water Management Plans and Water Shortage Contingency Plans.

These plans are a critical component of the steps we take to ensure there are sufficient water supplies to meet the current and future water needs of our customers, and we look forward to working with you on this important project.

Please let us know if you have any questions or need any additional information.

Cal Water Community Affairs

California Water Service
Quality. Service. Value.

Urban Water Management Plan and
Water Shortage Contingency Plan - 2020 Update

As a defined urban water supplier, California Water Service (Cal Water) is preparing an update to its Urban Water Management Plans (UWMP) and Water Shortage Contingency Plans (WSCP) that will address the water service conditions in our service areas. These documents support a water supplier's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions. It is Cal Water's intent to adopt the UWMPs, and the incorporated WSCPs, and file the plans as required with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service no later than 30 days after adoption.

Schedule of upcoming actions:

After a public review period, a public meeting to receive comments on the Draft UWMP and WSCP will be held. As the information becomes available for each service area, the electronic copy of the UWMP, WSCP, and information on the public meeting, including a link to participate, will be available at the following internet address:

https://www.calwater.com/conservation/uwmp-review/

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP or WSCP, you may send your comments via email to PlanningInfo@calwater.com.

Reliability Runs Deep

California Water Service
1720 North 1st Street - San Jose, CA 95112
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EMILY HERNANDEZ
CALIFORNIA WATER SERVICE CO/PLANNING DEPT.
1720 NORTH FIRST ST.
SAN JOSE, CA 95112

CNS 3468416

COPY OF NOTICE

Notice Type: GPN GOVT PUBLIC NOTICE

Ad Description -CALIFORNIA WATER SERVICE - BAKERSFIELD DISTRICT

To the right is a copy of the notice you sent to us for publication in the THE BAKERSFIELD CALIFORNIAN. Please read this notice carefully and call us with any corrections. The Proof of Publication will be filed with the County Clerk, if required, and mailed to you after the last date below. Publication date(s) for this notice is (are):

05/13/2021 , 05/20/2021

The charge(s) for this order is as follows. An invoice will be sent after the last date of publication. If you prepaid this order in full, you will not receive an invoice.

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THE INTER-CITY EXPRESS, OAKLAND	(510) 272-4747



NOTICE OF INTENT TO ADOPT AN URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN AND HOLD A PUBLIC MEETING TO RECEIVE COMMENTS ON THE PROPOSED PLANS CALIFORNIA WATER SERVICE – BAKERSFIELD DISTRICT

California Water Code (CWC) sections 10610 through 10656, known as the "Urban Water Management Planning Act" (Act), require all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an Urban Water Management Plan (UWMP) at least once every five years.

UWMPs support a water supplier's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions. The UWMP must describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation, and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The UWMP must also address measures for residential, commercial, governmental, and industrial water demand management.

Further, Section 10632 of the CWC requires that every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its plan (UWMP). Section 10632.2 provides that,

"An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan...or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1." The WSCP will be incorporated as an appendix of the UWMP.

One of Cal Water's service areas is the Bakersfield District, which is located in Kern County. The Bakersfield District serves portions of the City of Bakersfield and segments of unincorporated Kern County lands. As a defined urban water supplier, Cal Water is preparing an update to its UWMP that will address the water service conditions in the Bakersfield District. It is Cal Water's intent to adopt that UWMP, and the incorporated WSCP, and file that plan as required with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service no later than 30 days after adoption.

Schedule of upcoming actions:

On or about May 3, 2021, an electronic copy of the Draft 2020 UWMP and WSCP will be available for review. After a public review period, a public meeting to receive comments on the Draft UWMP and WSCP Plan for the Bakersfield District will be held online on June 1, 2021, at 7:00 p.m. The electronic copy of the UWMP, WSCP, and additional information on the public meeting, including a link to participate, is available at the following internet address: https://www.calwater.com/conservation/uwmp-review/

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP or WSCP, you may send your comments via email to PlanningInfo@calwater.com. Cal Water will receive comments on the Draft 2021 UWMP and WSCP from May 3 through June 1, 2021.

Please share this notice with others that may have interest in this matter.

5/13, 5/20/21

CNS-3468416#
THE BAKERSFIELD CALIFORNIAN

California Water Service

June 1, 2021

Quality. Service. Value.

Bakersfield District

2020 Urban Water Management Plan
2020 Water Shortage Contingency Plan

Meeting Agenda

- Purpose and objectives
- Introduce California Water Service (CWS) staff and consultants
- Presentation of the 2020 Urban Water Management Plan (UWMP)
- Presentation of 2020 Water Shortage Contingency Plan (WSCP)
- Drought update
- Public comments and questions

2020 UWMP Update: Public Outreach

- Preliminary information sent to relevant entities in February 2021
- Second notice sent to relevant entities in May 2021
- Two notices posted in local newspaper
- Draft 2020 UWMP and WSCP available for review at **https://www.calwater.com/conservation/uwmp-review/**
- Public hearing

Urban Water Management Planning Act

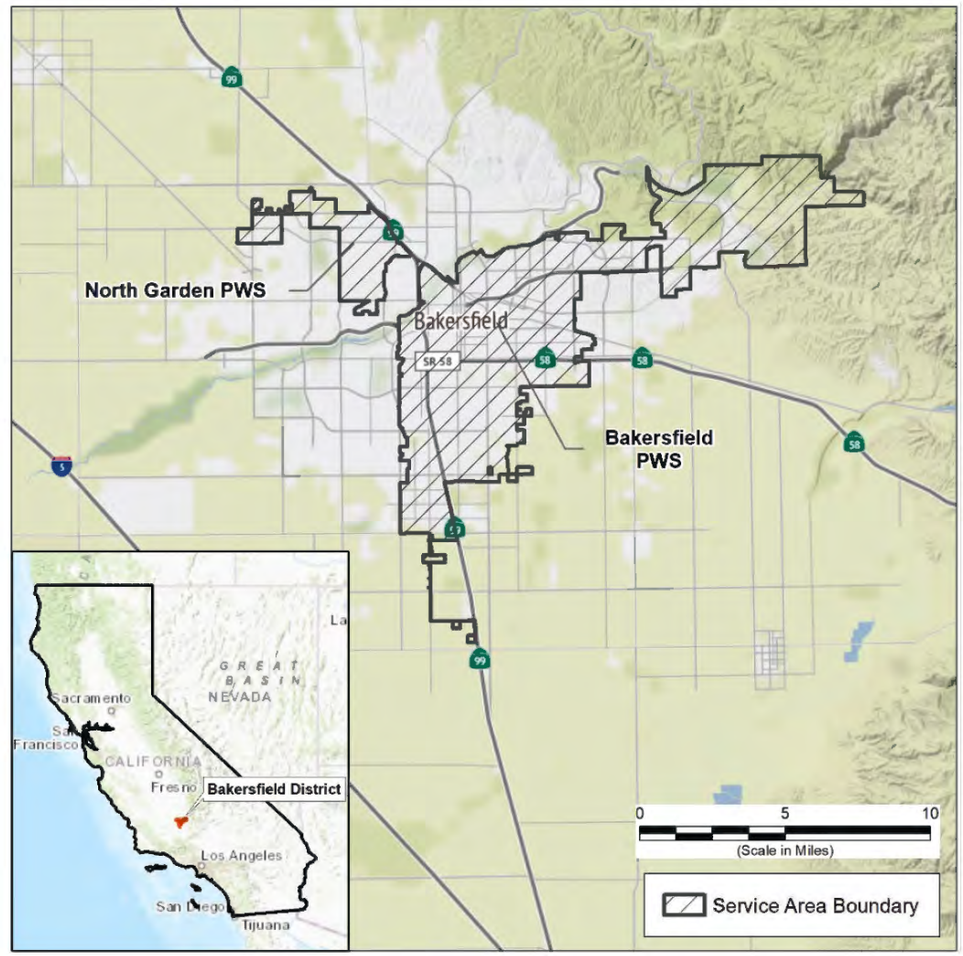
- Supports long-term water resource planning to ensure adequate supplies
- California Water Code - Sections 10610-10656
- Threshold: Utilities with 3,000+ services or 3,000+ acre-feet per year (AFY) water sales
- At least a 20-year planning horizon, Cal Water's plan covers 25 years
- Must be updated every 5 years and submitted by July 1, 2021
- Basis for SB-610 Water Supply Assessments and SB-221 Water Supply Verifications

UWMP Elements

- Service area description
- Population forecast
- Supply and demand projections through 2045 in normal, single dry and multiple dry years
- Water supply reliability
- Conservation/Demand Management Measures
- Climate change
- WSCP

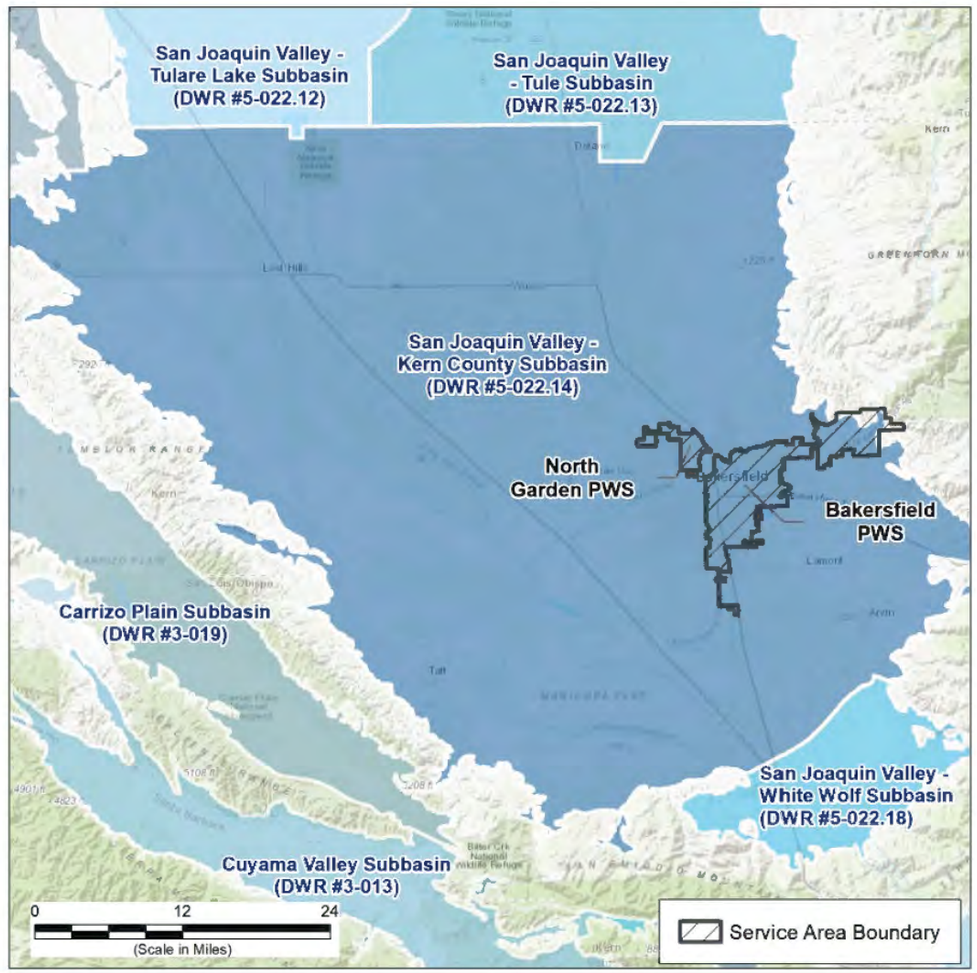
District Overview

- Serving Bakersfield District since 1926
- Two Public Water Systems
- Uses groundwater and purchased water from City of Bakersfield and Kern County Water Agency (KCWA) Improvement District 4 (ID-4)
- Distribution system includes 130 wells and 56 surface storage structures



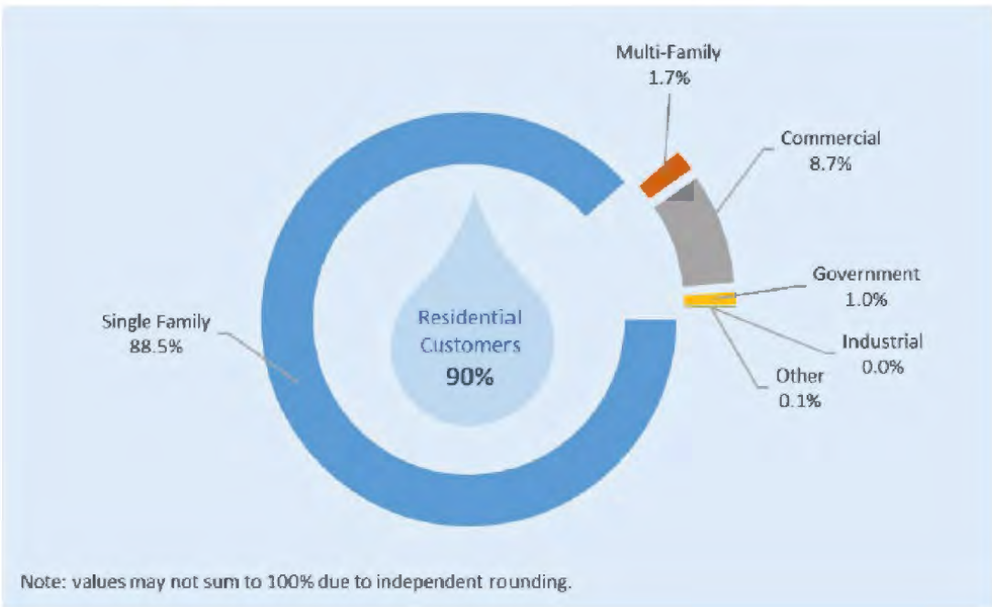
Water Supply Sources

- Groundwater pumped from the Kern County Subbasin
- Untreated local surface water purchased from City of Bakersfield
- Treated local surface and imported water purchased from KCWA ID-4
- Cal Water continues to investigate additional supply sources, however there is no current or projected use of recycled water or other supply sources



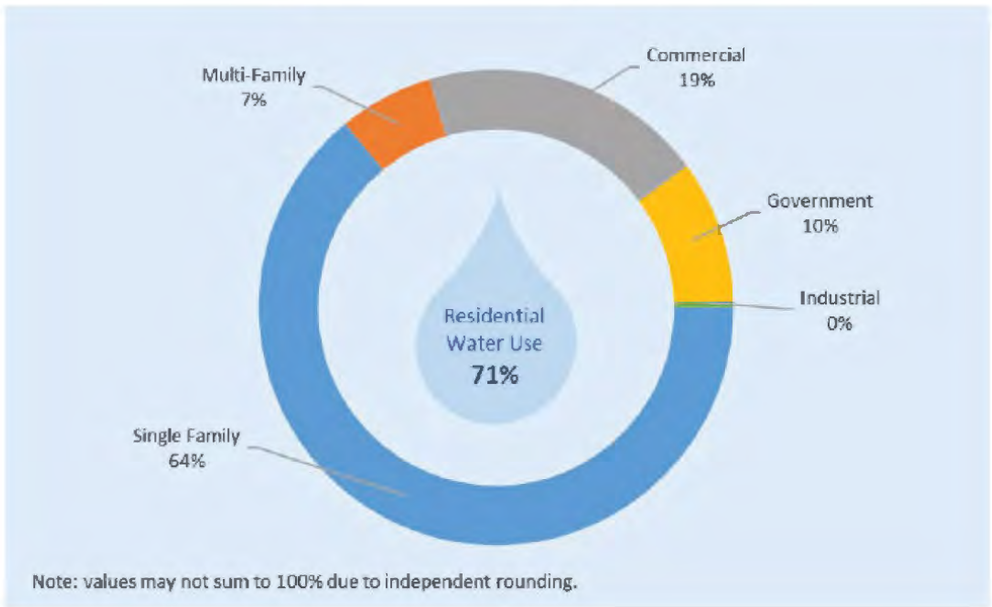
Distribution of Services/Demand

Types of Customers



Note: values may not sum to 100% due to independent rounding.

Demand



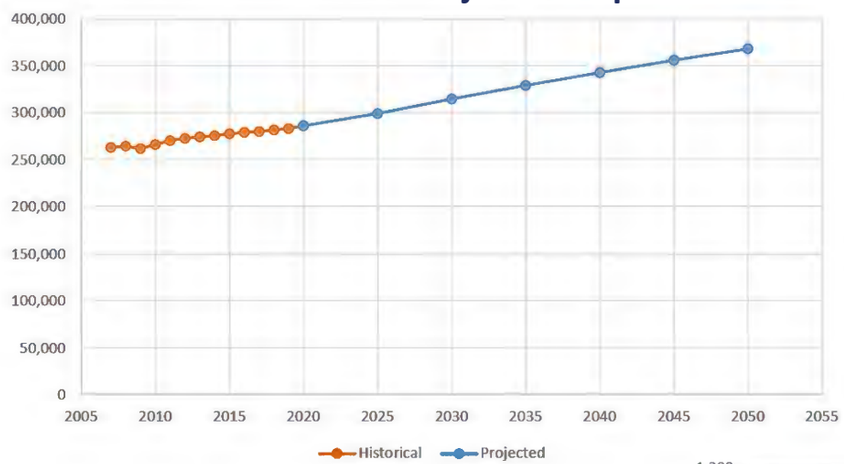
Note: values may not sum to 100% due to independent rounding.

Demand Projection Methodology

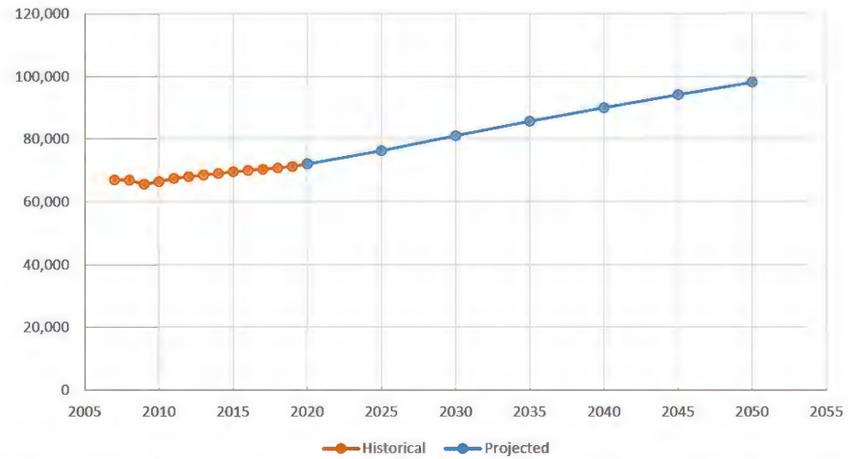
- Forecast horizon is beyond 20 years required by UWMP
- Generates normal-, wet-, and dry-year demand forecasts
- Directly considers impacts of climate change
- Demand model uses historical data on services, sales, production, population, and proposed conservation measures
- Regional Growth Forecast: housing and employment growth forecasts based on county-level forecasts prepared by Caltrans

Population & Account Projections

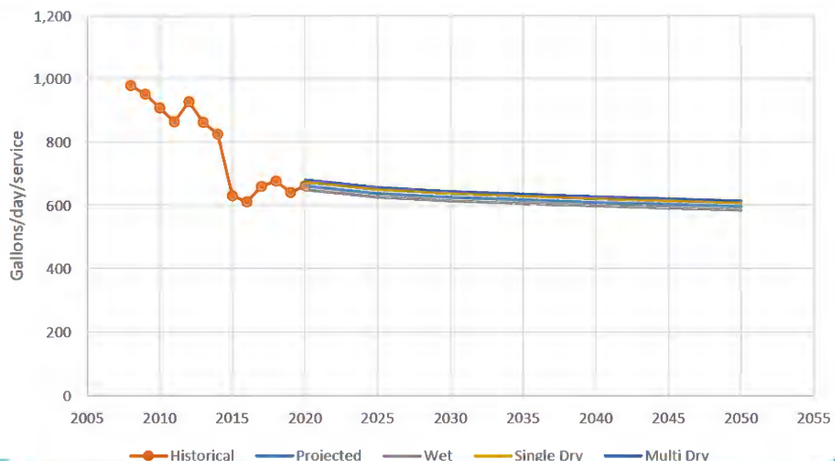
Historical and Projected Population



Historical and Projected Services

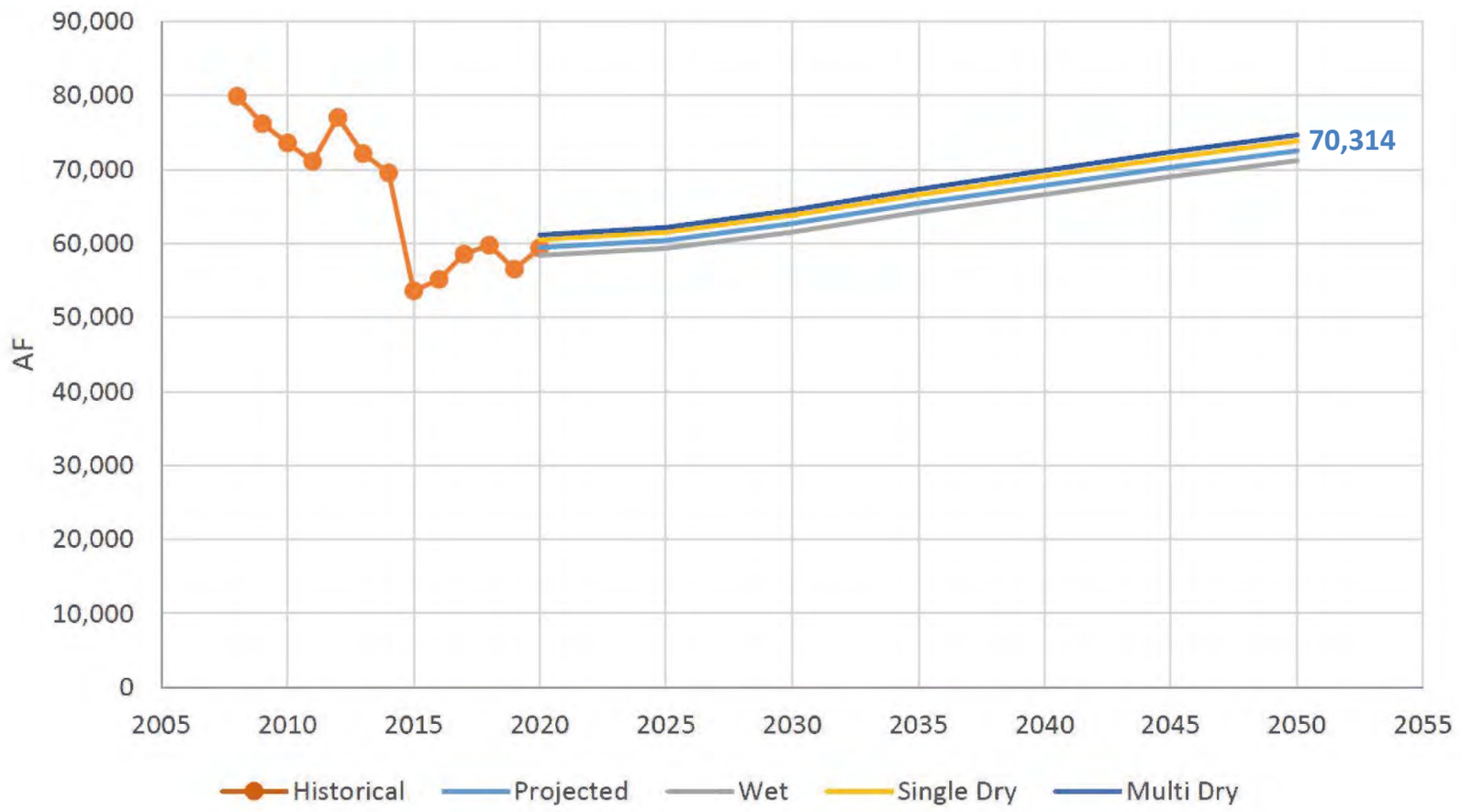


Average Demand Per Service



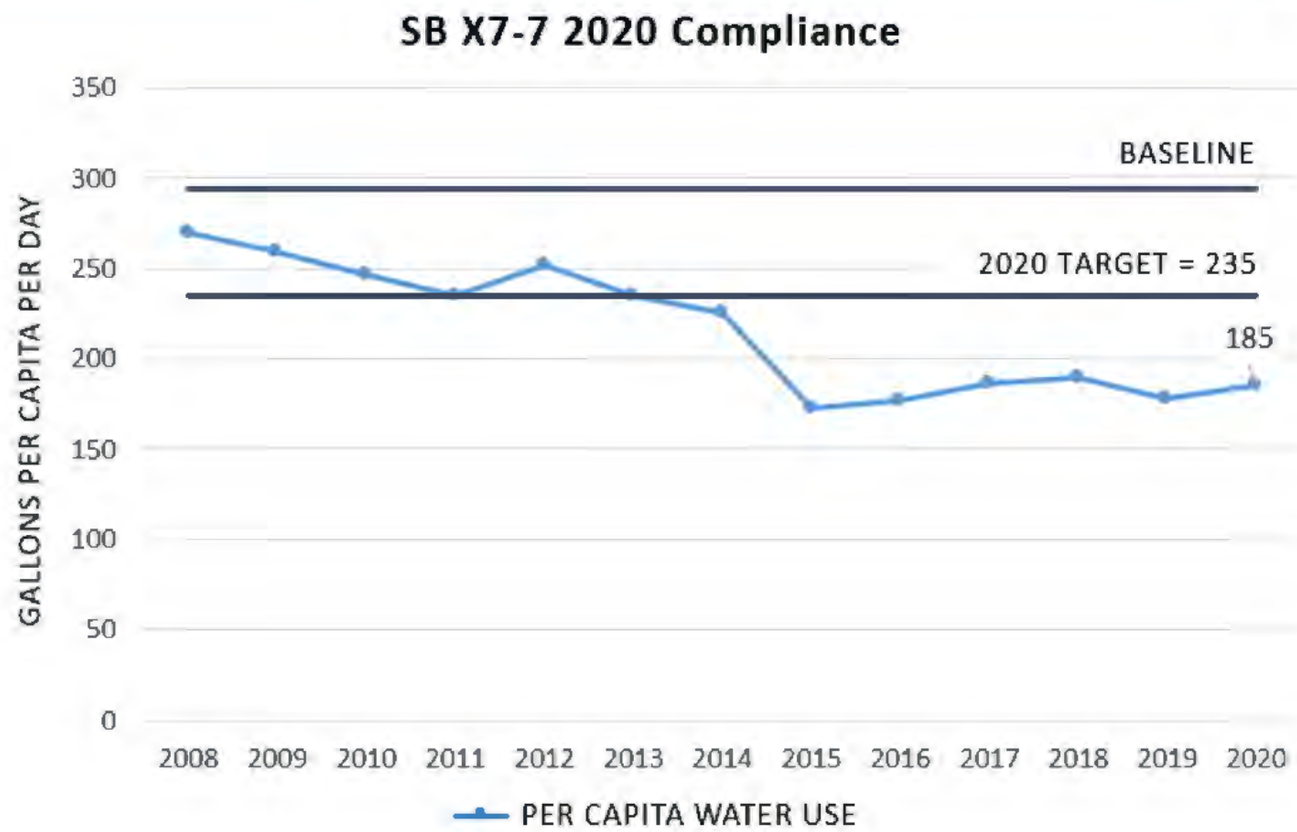
Demands for Potable Water - Projected

- 2045 demand projected to be 70,314 acre-feet per year
- 18% increase relative to 2020 demands



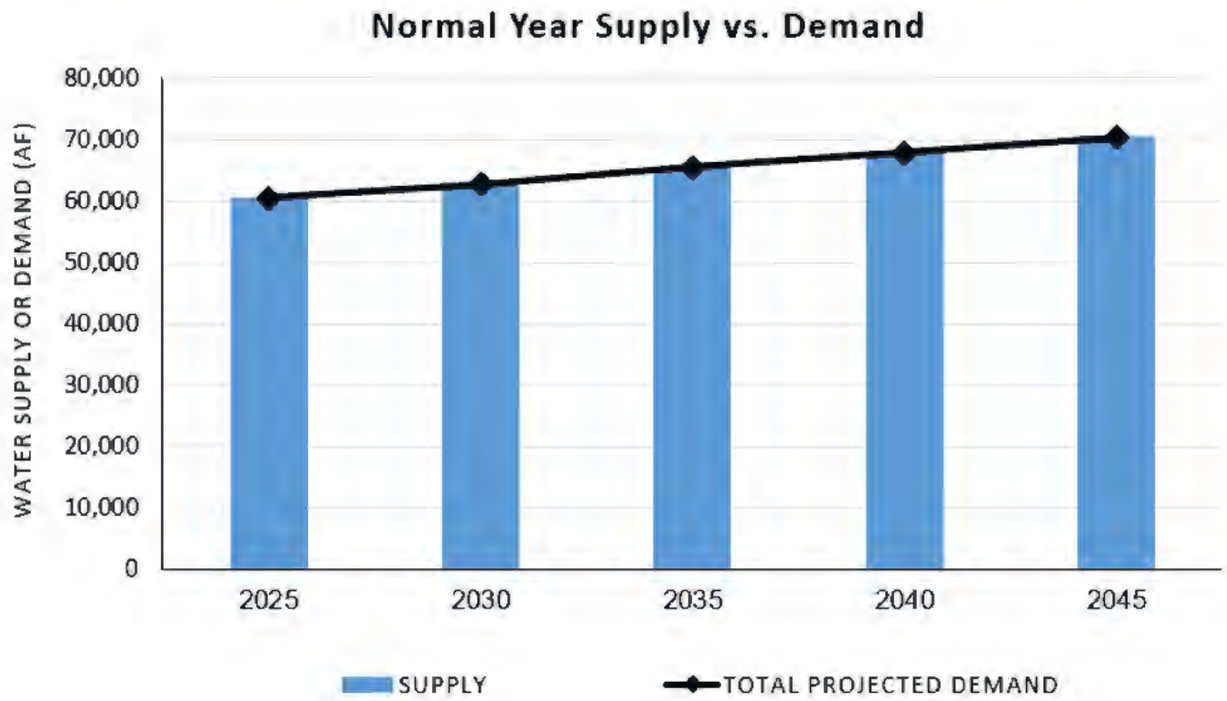
SB X7-7 (20% by 2020)

- Goal is to reduce per capita urban water use below baseline by:
  - 10% by Dec. 31, 2015
  - 20% by Dec. 31, 2020
- Bakersfield District met its 2020 Target



Supply Sufficiency

- Supply sufficiency analysis is based on the following factors:
  - Bakersfield District has always been able to meet historical demands; due to successful conservation, projected future demands are less than historical
  - Long-term supply agreements with wholesalers provide reliable surface water source
  - Municipal & Industrial (M&I) demands for groundwater are relatively minor within the Kern County Subbasin and are subject to certain legal protections
- Supply is projected to be sufficient to meet projected demand under normal, single dry, and multiple dry year conditions
- Any unexpected shortages will be addressed by the WSCP

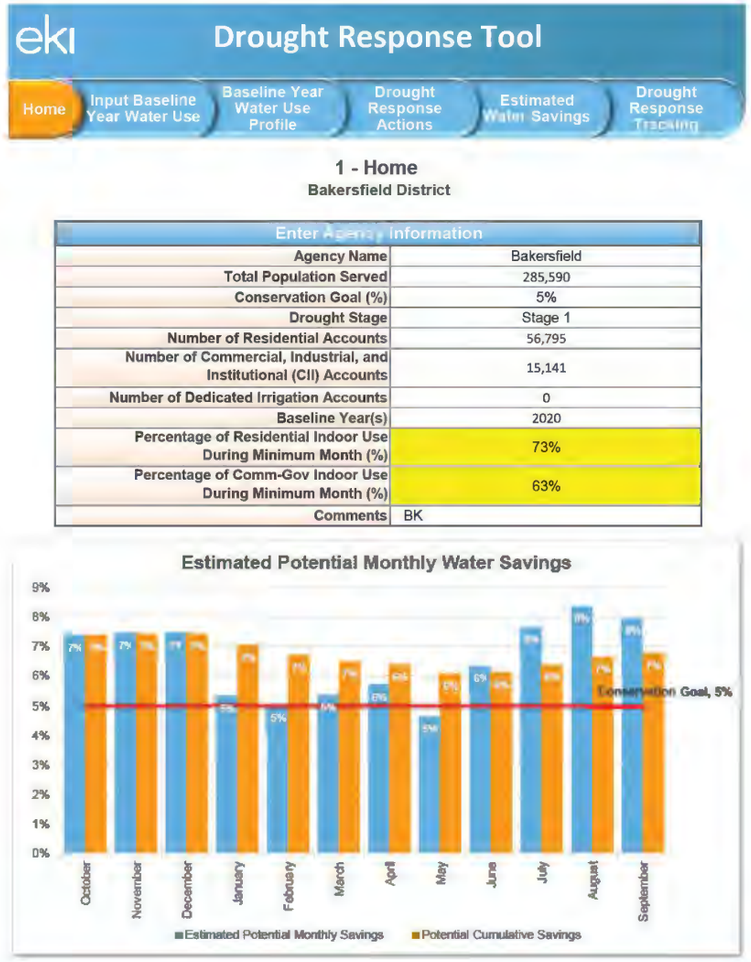


Local Topics – Bakersfield District

- Implementation of Sustainable Groundwater Management Act (SGMA) is in early stages and may impact future supply reliability
  - The Kern County Subbasin is determined by DWR to be in a condition of “critical overdraft”
  - The final Groundwater Sustainability Plans (GSPs) for the Kern County Subbasin are available on the DWR SGMA Portal website
- Cal Water is actively engaging in SGMA implementation and will incorporate any impacts into ongoing supply planning

Water Shortage Contingency Plan Elements

- Comprehensive drought response plan
  - Annual assessment of water supply reliability
  - Six standard shortage stages (10% to >50%)
  - Shortage response actions
  - Communication protocols
  - Monitoring, enforcement, and reporting
- Quantitatively assessed using Drought Response Tool



Drought Update

- Governor has issued drought emergencies in the majority of counties in California
- Cal Water is monitoring drought conditions in all of its service territories
  - Established a Drought Response Committee
  - Proactively developing conservation messaging
- Cal Water is closely coordinating its drought response with other water agencies and regulatory bodies
- Cal Water will follow protocols outlined in the WSCP as needed
  - Based on local conditions or state mandates

Questions or Comments

- Draft 2020 UWMP and 2020 WSCP available at **https://www.calwater.com/conservation/uwmp-review/**
- Comments on any parts of the UWMP will be accepted through June 1, 2021
- Send 2020 UWMP and WSCP comments to: planninginfo@calwater.com



Appendix D: Summary of Demand Projection Methodology and Assumptions

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Cal Water Long-Term Demand Forecast Model Overview

Forecast Domain

The forecast model generates separate forecasts for each customer class and distribution system. Table 1 lists Cal Water districts and distribution systems. Table 2 lists customer classes.

Forecast Horizon and Time Step

The forecast horizon is 30 years. The forecast has an annual time-step.

Normal, Wet, and Dry Year Forecasts

The forecast model generates normal-, wet-, and dry-year demand forecasts. The normal-year forecast is the default forecast. The wet- and dry-year forecasts can be substituted for the default forecast as necessary for system planning purposes. The model produces two different dry year forecasts: the single dry year forecast and the multiple dry year forecast. The latter represents the expected effect of prolonged drought conditions on unconstrained water demand.[1]

Relationship to GRC Sales Forecast

The first year of the forecast can be set to the current GRC sales forecast or actual consumption.

Relationship to PAWS

The demand model uses historical data on services, sales, production, and population from Cal Water's Production Analysis Worksheets (PAWS).

Accounting Rules

The model uses the following accounting rules to ensure forecast consistency:

- Population and conservation savings forecasts are functions of the service forecast.
- The sales forecast for a distribution system is the sum of the class-level sales forecasts for the distribution system. The production forecast for a distribution system is the sum of the sales and non-revenue water (NRW) forecasts for the distribution system.
- The sales and production forecasts for a district are the sum of the sales and production forecasts for its distribution systems.

Volume Units

Sales and production forecasts are in acre-feet (AF). Average sales and per capita forecasts are in gallons per day.

Per Capita Water Use

The model generates per capita forecasts for water use by single-family customers, water use by multi-family customers, water use by all residential customers, and water use by all district customers.

[1] Unconstrained demand is what demand would be in the absence of water use restrictions or policies intended to curtail water use.

Service Forecast

The forecast model generates three alternative service forecasts:

- Average Y-Y Change in Services. The model bases the forecast on the historical year-to-year (y-y) change in the number of services. This forecast assumes additive growth.
- Average Y-Y % Change in Services. The model bases the forecast on the historical y-y percentage change in services. This forecast assumes exponential growth.
- Regional Growth Forecast. The model uses regional housing and employment growth forecasts to project future services. Districts in the Bay Area use census-tract level growth forecasts prepared by the Association of Bay Area Governments (ABAG). Districts in Southern California use census-tract-level growth forecasts prepared by the Southern California Association of Governments (SCAG). The remaining districts use county-level forecasts prepared by Caltrans.

Regional Forecasts

Table 3 lists the regional forecasts in the model. Table 4 summarizes how the model uses the regional forecasts to project future services.

Service Floors and Ceilings

The forecast can include floors and ceilings on the service growth. The floor (ceiling) is the minimum (maximum) number of services allowed in the forecast.

User-Specified Growth Rates

The model allows user-specified growth rates.

Water Supply Assessments

The user can add to the forecast projected services and water use from Water Supply Assessments prepared for proposed development projects. The user can specify how much of this projected growth in services and water use the model should treat as additive to the baseline forecast.

Population Forecasts

The population projection is a function of the residential service projections to ensure internal consistency. Population in year t is:

$$Population_t = \left[\frac{persons}{service}\right]_{SFR} \cdot SFRservices_t + \left[\frac{persons}{service}\right]_{MFR} \cdot MFRservices_t$$

For multi-family services, the calculation of average persons per service uses the equation below. The model uses county assessor data linked to Cal Water customer data to estimate average dwelling units per parcel and average parcels per service. It uses census data to estimate average persons per dwelling unit.

$$\left[\frac{persons}{service}\right]_{MFR} = \frac{Avg\ Dwelling\ Units}{Parcel} \cdot \frac{Avg\ Parcels}{Service} \cdot \frac{Avg\ Persons}{Dwelling\ Unit}$$

Sales/Service Forecast

The model generates separate forecasts of sales/service for each customer class and distribution system.

Sales/Service Initialization

The model user sets sales/service for first year of the forecast to either current year water use or the most recent General Rate Case sales forecast. The 2020 UWMP projections start with 2020 actual sales/service.

Sales/Service Adjustments

In each forecast year, the model adjusts the previous year's sales/service estimate for:

1. Rebound from the 2012-16 drought
2. Passive water savings from plumbing codes and appliance standards
3. Active water savings from Cal Water conservation programs
4. Real changes in the marginal cost of water service
5. Real changes in per capita income

The user can select which adjustments to apply. The 2020 UWMP projections include all the adjustments except the drought rebound adjustment. The 2020 UWMP projections exclude the drought rebound adjustment because analysis of recent consumption trends showed that further rebound from the 2012-2016 drought was unlikely.

A description of each adjustment follows.

Drought Rebound

The model adjusts the sales/service forecast for demand recovery following the 2012-2016 drought. The model makes this adjustment using data on the growth in sales/service between 2016 and 2017. The model assumes some of the savings achieved during the drought will be permanent. The user can set the level of permanent drought savings. The default setting is 20%.

Passive Water Savings

The model uses DWR projections of water savings from plumbing/building codes to forecast passive water savings.[2] The model extends the DWR projections, which run through 2040, to 2050.

Active Water Savings

The model uses conservation program savings projections from Cal Water's 2015 Conservation Master Plans to forecast active water savings.

Price and Income Adjustments

The model adjusts average sales for expected changes in real income and cost of water service. The adjustment equation is:[3]

[2] M.Cubed. 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD. Technical Memorandum prepared by David Mitchell for the California Department of Water Resources. August 30, 2016.

[3] The model uses a constant-elasticity-of-demand specification: $Q_t = AP_t^{\varepsilon} I_t^{\delta}$

$$\Delta Q_t = Q_0 \left(1 - \left(\frac{P_t}{P_0}\right)^{\varepsilon} \left(\frac{I_t}{I_0}\right)^{\delta}\right)$$

where Q_0 is sales/service in the base year of the forecast, $\left(\frac{P_t}{P_0}\right)$ and $\left(\frac{I_t}{I_0}\right)$ are the price of water and income relative to the base year of the forecast, and ε and δ are empirically derived estimates of price and income elasticity.

Sales Forecast

The sales forecast is the product of the service and average use per service forecasts.

Non-Revenue Water Forecast

The non-revenue water forecast is a function of the services forecast. The forecast starts with an initial estimate of non-revenue water, expressed in gallons/connection/day. The model decomposes this estimate into real and apparent loss. The model assumes future apparent loss is equal to the average apparent loss for the five year before the start of the forecast. In the case of real loss, the model assumes Cal Water's loss management program will reduce real losses over time. The amount of reduction depends on the staring estimate of real loss. If this estimate is 10 gallons/connection/day or less, the model assumes no further reduction. Otherwise, the model assumes real losses (in gallons/connection/day) will decrease until they are equal to 75% of the average real loss for the five years before the start of the forecast or the State Water Board draft real water loss standard for the distribution system, whichever is greater.[4] The model assumes the reduction in real loss will occur between 2020 and 2030.

Production Forecast

The production forecast is the sum of the sales and NRW forecasts.

Normal, Wet, Single Dry, and Multiple Dry Year Projections

The model generates normal, wet, single dry, and multiple dry year forecasts of sales and production. The model bases these forecasts on empirically derived relationships between monthly water sales, rainfall, and air temperature estimated for each Cal Water district.[5]

- Wet year – minus one standard deviation weather effect on sales and production
- Single dry year – plus one standard deviation weather effect on sales and production
- Multiple dry year – plus 1.6 standard deviations weather effect on sales and production

In the case of the dry year forecasts, the model is forecasting demand in the absence of drought water use restrictions or other policies that would limit water use in dry years.

[4] The State Water Board did not develop a draft water loss standard for every Cal Water distribution system. For those without a draft standard, the model assumes real losses will decrease until they are equal to 75% of the average real loss for the five year before the start of the forecast.

[5] A&N Technical Services, Cal Water Long Term Water Demand Forecast Model, December 2014.

Table 1. Long-Term Demand Model Districts and Systems

Label	District-System	Notes
AV	**Antelope Valley District**	
AV-FMT	Fremont System	
AV-LAN	Lancaster System	
AV-LKH	Lake Hughes System	
AV-LVY	Leona Valley System	
BG	**Bear Gulch District**	No sub-systems in district
BK	**Bakersfield District**	
BK-BK	Bakersfield System	
BK-NG	North Garden System	
CH	**Chico District**	
CH-CH	Chico System	
CH-HAM	Hamilton City System	
DIX	**Dixon District**	No sub-systems in district
DOM	**Dominguez District**	No sub-systems in district
ELA	**East Los Angeles District**	No sub-systems in district
HAW	**Hawthorne District**	No sub-systems in district
HR	**Hermosa-Redondo District**	No sub-systems in district
KC	**King City District**	No sub-systems in district
KRV	**Kern River Valley District**	
KRV-BDFLO	Lower Bodfish System	
KRV-BDFUP	Upper Bodfish System	
KRV-KNVARD	Kernville & Arden System	Includes KNV, KRVArdenWaterCo, COUN, MSH, POND
KRV-LKL	Lakeland System	
KRV-ONX	Onyx System	
KRV-SLK	South Lake System	Includes SQM
KRV-SPM	Split Mountain System	
LAS	**Los Altos District**	No sub-systems in district
LIV	**Livermore District**	No sub-systems in district

Label	District-System	Notes
MPS	**Mid-Peninsula District**	
MPS-SM	San Mateo System	
MPS-SC	San Carlos System	
MRL	**Marysville District**	No sub-systems in district
ORO	**Oroville District**	No sub-systems in district
PV	**Palos Verdes District**	No sub-systems in district
RDV	**Redwood Valley District**	
RDV-ARM	Armstrong System	
RDV-CSP	Coast Springs System	
RDV-HKN	Hawkins Water System	
RDV-LUC	Lucerne System	
RDV-NOH	Noel Heights System	
RDV-RPD	Rancho del Paradiso System	
SEL	**Selma District**	No sub-systems in district
SLN	**Salinas District**	
SLN-SLN	Salinas System	Includes Bolsa Knolls, Country Meadows
SLN-SLNH	Salinas Hills System	Includes Buena Vista, Indian Springs
SLN-OH	Oak Hill System	
SLN-LL	Las Lomas System	
SSF	**South San Francisco District**	No sub-systems in district
STK	**Stockton District**	No sub-systems in district
VIS	**Visalia District**	No sub-systems in district
WIL	**Willows District**	No sub-systems in district
WLK	**Westlake District**	No sub-systems in district

Table 2. Long-Term Demand Model Customer Classes

Label	Description	Revenue Class #
SFR	Single-Family Residential	1
FLT	Single-Family Flat Rate	4
RES	SFR + FLT	1, 4
MFR	Multi-Family	15
COM	Commercial/Business	2
GOV	Government/Public Authority	11
IND	Industrial	3
OTH	Other/miscellaneous	8,13
IRR	Dedicated irrigation customers	7

Table 3. Regional Forecasts used in First Generation Long-term Demand Model Forecasts

Regional Forecast	Version	Range
ABAG	Plan Bay Area 2040, GEOID10-level summary	2010 to 2040
SCAG	RTP07 GEOID10-level	2010 to 2035
Caltrans	2017 County Forecasts	2010 to 2050

Table 4. Regional Growth Rates used in the Service Growth Forecasts

Service Class	ABAG	SCAG	Caltrans
SFR	y-y % change in single-family dwelling units	y-y % change in all residential dwelling units	y-y % change in single-family dwelling units
MFR	y-y % change in multi-family dwelling units	y-y % change in all residential dwelling units	y-y % change in multi-family dwelling units
COM	y-y % change in total number of jobs	y-y % change in total number of jobs	y-y % change in county employment in retail, wholesale, information, financial, professional, and leisure sectors
GOV	y-y % change in gov't, information, and construction jobs	y-y % change in total number of jobs	y-y % change in county employment in federal, state, local government and education and healthcare sectors
IND	y-y % change in manufacturing jobs	y-y % change in total number of jobs	y-y % change in county employment in manufacturing sectors

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Historical and Projected Services, Water Sales, and Total Production

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District Demand Projection Report
Bakersfield

6/4/2021

General Rate Case Sales Baseline 2020

Historical Data Range
First Year 2007
Last Year 2020

Forecast Range
First Year 2020
Last Year 2050

Service Growth Basis Caltrans Growth Forecasts

Service Growth Rates

Class	Caltrans Projected	Historical %Y-Y[1] 5-Yr	10-Yr	15-Yr	20-Yr
RES[2]	1.0%	0.8%	0.9%		
MFR	0.4%	0.1%	1.0%		
COM	0.8%	-0.1%	0.1%		
GOV	0.8%	0.5%	1.0%		
IND	0.4%	0.8%	0.0%		
TOT		0.7%	0.8%		

Water Supply Assessments

	WSA Name	Completion Date	Incorporated into Forecast (Y/N)
1			
2			
3			
4			
5			

Sales Forecast Adjustments

Drought Rebound	OFF
Plumbing Code	ON
Active Conservation	ON
Price Response	ON
Income Response	ON

Non-Revenue Water (NRW) Basis

Real loss (gal/con/day):
2016-2020 average if <= 10 gal/con/day
Draft Water Board standard or 75% of 2016-2020 average, whichever is greater, by 2030.
Apparent loss (gal/con/day): 2016-2020 average.

1. Account reclassifications can impact historical %Y-Y growth rates for individual customer classes.
2. RES = Metered and unmetered single-family residential customers.

Historical Service Counts

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000								
2001								
2002								
2003								
2004								
2005								
2006								
2007	59,068	931	6,243	579	35	135	0	66,991
2008	58,924	998	6,269	594	33	103	0	66,920
2009	57,590	1,035	6,245	653	32	69	0	65,624
2010	58,357	1,089	6,229	661	32	56	0	66,424
2011	59,270	1,185	6,249	670	32	55	0	67,462
2012	59,852	1,194	6,262	685	32	51	0	68,076
2013	60,338	1,194	6,260	693	31	53	0	68,568
2014	60,825	1,190	6,273	696	30	69	0	69,083
2015	61,294	1,199	6,305	712	30	76	0	69,616
2016	61,670	1,200	6,310	728	31	72	0	70,011
2017	62,068	1,194	6,284	724	31	78	0	70,378
2018	62,535	1,200	6,284	732	31	73	0	70,854
2019	63,017	1,197	6,269	730	31	75	0	71,319
2020	63,838	1,202	6,264	731	32	77	0	72,144
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	0.8%	0.1%	-0.1%	0.5%	0.8%	0.2%		0.7%
10-Year	0.9%	1.0%	0.1%	1.0%	0.0%	3.2%		0.8%
15-Year								
20-Year								

CAGR = Compound Annual Growth Rate

District Demand Projection Report
Bakersfield

Historical Sales (AF)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000								
2001								
2002								
2003								
2004								
2005								
2006								
2007								
2008	50,344	3,673	13,172	5,926	66	344	0	73,525
2009	47,800	3,718	12,822	5,534	53	152	0	70,079
2010	46,612	3,520	11,932	5,443	45	131	0	67,683
2011	43,886	3,757	12,013	5,598	56	95	0	65,406
2012	47,680	3,919	12,389	6,724	56	134	0	70,902
2013	43,261	3,874	12,403	6,674	51	144	0	66,407
2014	41,398	3,733	12,326	6,134	51	356	0	63,997
2015	31,407	3,386	10,121	4,142	58	200	0	49,314
2016	30,449	3,243	9,577	4,597	38	174	0	48,078
2017	33,149	3,317	10,123	5,380	46	148	0	52,163
2018	34,491	3,366	10,412	5,412	39	188	0	53,907
2019	32,852	3,323	10,146	4,785	40	212	0	51,359
2020	35,018	3,400	10,018	4,976	42	182	0	53,635
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	2.2%	0.1%	-0.2%	3.7%	-6.4%	-1.9%		1.7%
10-Year	-2.8%	-0.3%	-1.7%	-0.9%	-0.7%	3.4%		-2.3%
15-Year								
20-Year								

CAGR = Compound Annual Growth Rate

Historical Sales/Service (GPD)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000								
2001								
2002								
2003								
2004								
2005								
2006								
2007								
2008	763	3,286	1,876	8,912	1,781	2,993		981
2009	741	3,205	1,833	7,565	1,454	1,977		953
2010	713	2,887	1,710	7,350	1,265	2,083		910
2011	661	2,831	1,716	7,460	1,573	1,536		866
2012	711	2,930	1,766	8,758	1,551	2,375		930
2013	640	2,895	1,769	8,599	1,477	2,405		865
2014	608	2,801	1,754	7,871	1,515	4,593		827
2015	457	2,521	1,433	5,197	1,701	2,358		632
2016	441	2,412	1,355	5,640	1,100	2,149		613
2017	477	2,479	1,438	6,638	1,355	1,694		662
2018	492	2,505	1,479	6,599	1,110	2,310		679
2019	465	2,478	1,445	5,856	1,157	2,527		643
2020	490	2,525	1,428	6,077	1,173	2,122		664
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	1.4%	0.0%	-0.1%	3.2%	-7.2%	-2.1%		1.0%
10-Year	-3.7%	-1.3%	-1.8%	-1.9%	-0.7%	0.2%		-3.1%
15-Year								
20-Year								

CAGR = Compound Annual Growth Rate

District Demand Projection Report
Bakersfield

Historical Production (AF)

YEAR	SALES	NRW	PROD	NRW %	NRW GPD/Svc
2000					
2001					
2002					
2003					
2004					
2005					
2006					
2007					
2008	73,525	6,393	79,918	8.0%	85
2009	70,079	6,094	76,173	8.0%	83
2010	67,683	5,885	73,568	8.0%	79
2011	65,406	5,687	71,094	8.0%	75
2012	70,902	6,165	77,067	8.0%	81
2013	66,407	5,774	72,181	8.0%	75
2014	63,997	5,565	69,562	8.0%	72
2015	49,314	4,288	53,602	8.0%	55
2016	48,078	7,094	55,171	12.9%	90
2017	52,163	6,409	58,572	10.9%	81
2018	53,907	5,866	59,773	9.8%	74
2019	51,359	5,166	56,525	9.1%	65
2020	53,635	5,783	59,418	9.7%	72
2021					
2022					
2023					
2024					
2025					
2026					
2027					
2028					
2029					
2030					

CAGR	SALES	NRW	PROD		NRW GPD/Svc
5-Year	1.7%	6.2%	2.1%		5.4%
10-Year	-2.3%	-0.2%	-2.1%		-1.0%
15-Year					
20-Year					

CAGR = Compound Annual Growth Rate

Historical GPCD

		GPCD	
YEAR	POPULATION	RESIDENTIAL	TOTAL
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007	263,288		
2008	264,626	182	270
2009	262,094	175	259
2010	266,331	168	247
2011	270,421	157	235
2012	272,901	169	252
2013	274,500	153	235
2014	275,768	146	225
2015	277,889	112	172
2016	279,181	108	176
2017	280,074	116	187
2018	281,942	120	189
2019	283,321	114	178
2020	286,310	120	185
2021			
2022			
2023			
2024			
2025			
2026			
2027			
2028			
2029			
2030			

CAGR	POPULATION	RESIDENTIAL GPCD	TOTAL GPCD
5-Year	0.6%	1.4%	1.5%
10-Year	0.7%	-3.3%	-2.8%
15-Year			
20-Year			

CAGR = Compound Annual Growth Rate

Projected Services

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	63,838	1,202	6,264	731	32	77	0	72,144
2021	64,540	1,208	6,334	738	32	73	0	72,925
2022	65,270	1,214	6,408	746	32	72	0	73,741
2023	66,010	1,220	6,484	754	32	72	0	74,572
2024	66,790	1,226	6,549	762	32	72	0	75,431
2025	67,638	1,231	6,611	772	32	72	0	76,357
2026	68,511	1,238	6,662	781	33	72	0	77,296
2027	69,367	1,245	6,717	789	33	72	0	78,222
2028	70,264	1,252	6,776	796	33	72	0	79,192
2029	71,181	1,260	6,837	803	33	72	0	80,186
2030	72,097	1,268	6,902	810	33	72	0	81,182
2031	72,984	1,276	6,965	817	33	72	0	82,147
2032	73,840	1,283	7,026	825	33	72	0	83,079
2033	74,679	1,290	7,085	832	33	72	0	83,991
2034	75,489	1,296	7,142	839	34	72	0	84,872
2035	76,281	1,303	7,198	846	34	72	0	85,734
2036	77,086	1,309	7,251	854	34	72	0	86,605
2037	77,880	1,314	7,301	861	34	72	0	87,463
2038	78,674	1,320	7,352	868	34	72	0	88,320
2039	79,484	1,325	7,402	875	34	72	0	89,193
2040	80,285	1,330	7,452	882	34	72	0	90,057
2041	81,078	1,335	7,503	889	35	72	0	90,912
2042	81,876	1,340	7,555	896	35	72	0	91,773
2043	82,642	1,344	7,607	903	35	72	0	92,603
2044	83,402	1,349	7,659	910	35	72	0	93,427
2045	84,171	1,353	7,711	917	35	72	0	94,259
2046	84,921	1,357	7,763	924	35	72	0	95,071
2047	85,674	1,361	7,815	930	35	72	0	95,888
2048	86,395	1,365	7,867	937	36	72	0	96,672
2049	87,115	1,368	7,921	944	36	72	0	97,455
2050	87,844	1,372	7,974	951	36	72	0	98,249

Projected Sales (AF)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	35,018	3,400	10,018	4,976	42	182	0	53,635
2021	34,811	3,364	10,044	4,992	42	175	0	53,428
2022	35,003	3,370	10,089	5,019	42	171	0	53,694
2023	35,212	3,377	10,141	5,049	42	171	0	53,992
2024	35,456	3,385	10,177	5,076	42	171	0	54,307
2025	35,756	3,394	10,209	5,122	43	171	0	54,694
2026	36,187	3,404	10,225	5,157	43	171	0	55,187
2027	36,561	3,415	10,248	5,180	43	171	0	55,618
2028	36,947	3,425	10,279	5,203	43	171	0	56,068
2029	37,360	3,441	10,316	5,226	43	171	0	56,558
2030	37,777	3,457	10,358	5,249	44	171	0	57,056
2031	38,185	3,473	10,406	5,274	44	171	0	57,552
2032	38,563	3,488	10,450	5,302	44	171	0	58,017
2033	38,973	3,503	10,491	5,329	44	171	0	58,511
2034	39,379	3,519	10,530	5,356	44	171	0	58,999
2035	39,779	3,533	10,567	5,382	44	171	0	59,478
2036	40,153	3,547	10,601	5,409	44	171	0	59,925
2037	40,508	3,560	10,632	5,434	45	171	0	60,349
2038	40,880	3,572	10,663	5,459	45	171	0	60,791
2039	41,244	3,584	10,694	5,484	45	171	0	61,222
2040	41,601	3,596	10,725	5,508	45	171	0	61,646
2041	41,961	3,608	10,757	5,531	45	171	0	62,073
2042	42,331	3,619	10,790	5,555	46	171	0	62,511
2043	42,692	3,630	10,824	5,578	46	171	0	62,939
2044	43,065	3,641	10,857	5,600	46	171	0	63,381
2045	43,423	3,651	10,890	5,622	46	171	0	63,804
2046	43,771	3,661	10,923	5,644	46	171	0	64,217
2047	44,116	3,671	10,957	5,666	46	171	0	64,628
2048	44,446	3,680	10,990	5,687	47	171	0	65,021
2049	44,782	3,689	11,024	5,709	47	171	0	65,422
2050	45,129	3,698	11,059	5,730	47	171	0	65,833

Projected Sales/Service (GPD)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	490	2,525	1,428	6,077	1,173	2,122	0	664
2021	482	2,486	1,416	6,039	1,173	2,122	0	654
2022	479	2,478	1,406	6,007	1,173	2,122	0	650
2023	476	2,472	1,396	5,978	1,173	2,122	0	646
2024	474	2,466	1,387	5,948	1,173	2,122	0	643
2025	472	2,461	1,379	5,920	1,173	2,122	0	639
2026	472	2,455	1,370	5,891	1,173	2,122	0	637
2027	471	2,449	1,362	5,863	1,173	2,122	0	635
2028	469	2,443	1,354	5,836	1,173	2,122	0	632
2029	469	2,439	1,347	5,810	1,173	2,122	0	630
2030	468	2,435	1,340	5,784	1,173	2,122	0	627
2031	467	2,431	1,334	5,762	1,173	2,122	0	625
2032	466	2,427	1,328	5,740	1,173	2,122	0	623
2033	466	2,425	1,322	5,719	1,173	2,122	0	622
2034	466	2,423	1,316	5,698	1,173	2,122	0	621
2035	466	2,421	1,311	5,677	1,173	2,122	0	619
2036	465	2,419	1,305	5,656	1,173	2,122	0	618
2037	464	2,418	1,300	5,635	1,173	2,122	0	616
2038	464	2,416	1,295	5,615	1,173	2,122	0	614
2039	463	2,415	1,290	5,594	1,173	2,122	0	613
2040	463	2,413	1,285	5,574	1,173	2,122	0	611
2041	462	2,412	1,280	5,554	1,173	2,122	0	610
2042	462	2,411	1,275	5,534	1,173	2,122	0	608
2043	461	2,410	1,270	5,515	1,173	2,122	0	607
2044	461	2,410	1,266	5,495	1,173	2,122	0	606
2045	461	2,409	1,261	5,475	1,173	2,122	0	604
2046	460	2,408	1,256	5,456	1,173	2,122	0	603
2047	460	2,408	1,252	5,437	1,173	2,122	0	602
2048	459	2,407	1,247	5,418	1,173	2,122	0	600
2049	459	2,407	1,243	5,399	1,173	2,122	0	599
2050	459	2,406	1,238	5,380	1,173	2,122	0	598

Projected Production (AF)

YEAR	SALES	NRW	PROD	% NRW	NRW GPD/Svc
2020	53,635	5,846	59,481	9.8%	72
2021	53,428	5,825	59,253	9.8%	71
2022	53,694	5,803	59,497	9.8%	70
2023	53,992	5,782	59,774	9.7%	69
2024	54,307	5,764	60,071	9.6%	68
2025	54,694	5,745	60,439	9.5%	67
2026	55,187	5,722	60,909	9.4%	66
2027	55,618	5,700	61,318	9.3%	65
2028	56,068	5,678	61,747	9.2%	64
2029	56,558	5,654	62,212	9.1%	63
2030	57,056	5,625	62,681	9.0%	62
2031	57,552	5,689	63,241	9.0%	62
2032	58,017	5,751	63,768	9.0%	62
2033	58,511	5,812	64,322	9.0%	62
2034	58,999	5,871	64,870	9.1%	62
2035	59,478	5,931	65,408	9.1%	62
2036	59,925	5,989	65,915	9.1%	62
2037	60,349	6,048	66,397	9.1%	62
2038	60,791	6,108	66,899	9.1%	62
2039	61,222	6,167	67,389	9.2%	62
2040	61,646	6,226	67,871	9.2%	62
2041	62,073	6,285	68,358	9.2%	62
2042	62,511	6,341	68,852	9.2%	62
2043	62,939	6,398	69,337	9.2%	62
2044	63,381	6,455	69,835	9.2%	62
2045	63,804	6,511	70,314	9.3%	62
2046	64,217	6,567	70,784	9.3%	62
2047	64,628	6,620	71,248	9.3%	62
2048	65,021	6,674	71,695	9.3%	62
2049	65,422	6,728	72,150	9.3%	62
2050	65,833	6,728	72,561	9.3%	61

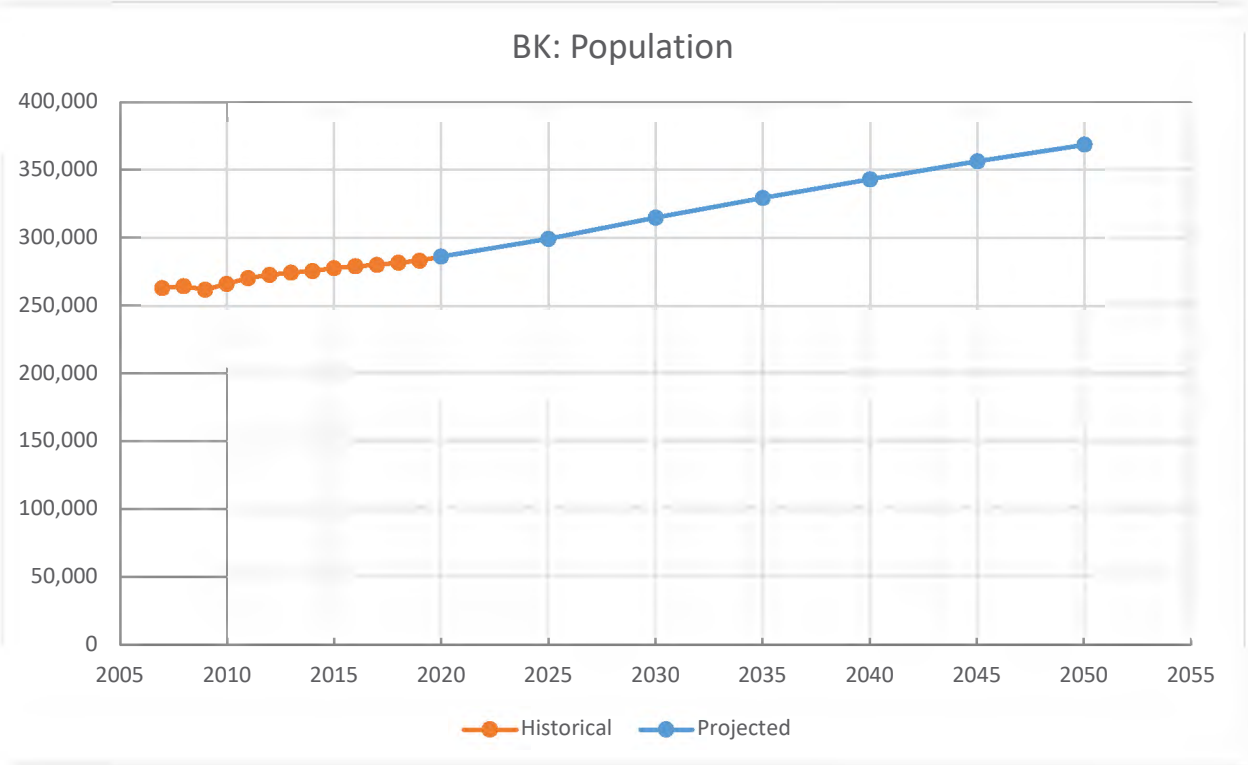
Projected GPCD

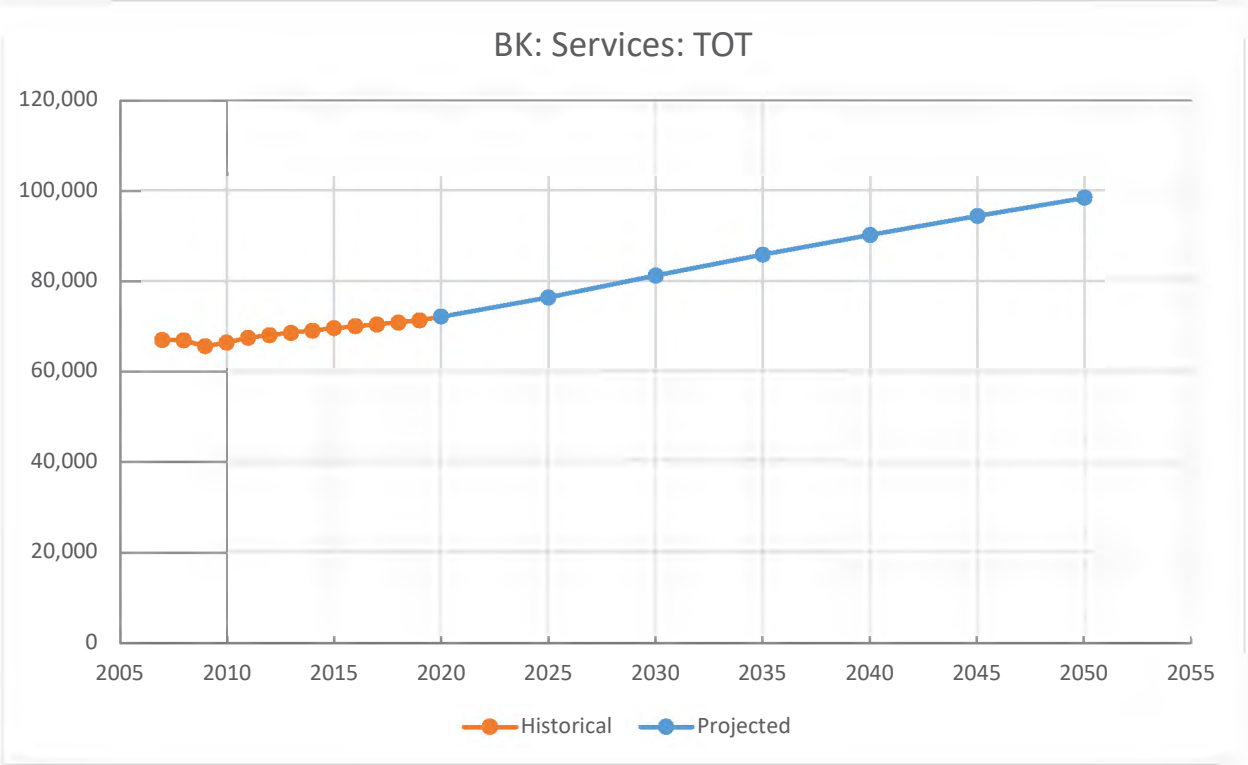
		GPCD	
YEAR	POPULATION	RESIDENTIAL	TOTAL
2020	286,310	144	185
2021	288,735	141	183
2022	291,254	141	182
2023	293,806	140	182
2024	296,476	139	181
2025	299,366	139	180
2026	302,365	139	180
2027	305,317	138	179
2028	308,396	138	179
2029	311,575	138	178
2030	314,753	138	178
2031	317,828	138	178
2032	320,788	137	177
2033	323,685	137	177
2034	326,478	137	177
2035	329,207	137	177
2036	331,967	137	177
2037	334,685	137	177
2038	337,396	137	177
2039	340,155	137	177
2040	342,878	137	177
2041	345,567	137	177
2042	348,272	136	176
2043	350,869	136	176
2044	353,441	136	176
2045	356,039	136	176
2046	358,570	136	176
2047	361,106	136	176
2048	363,535	136	176
2049	365,954	136	176
2050	368,400	136	176

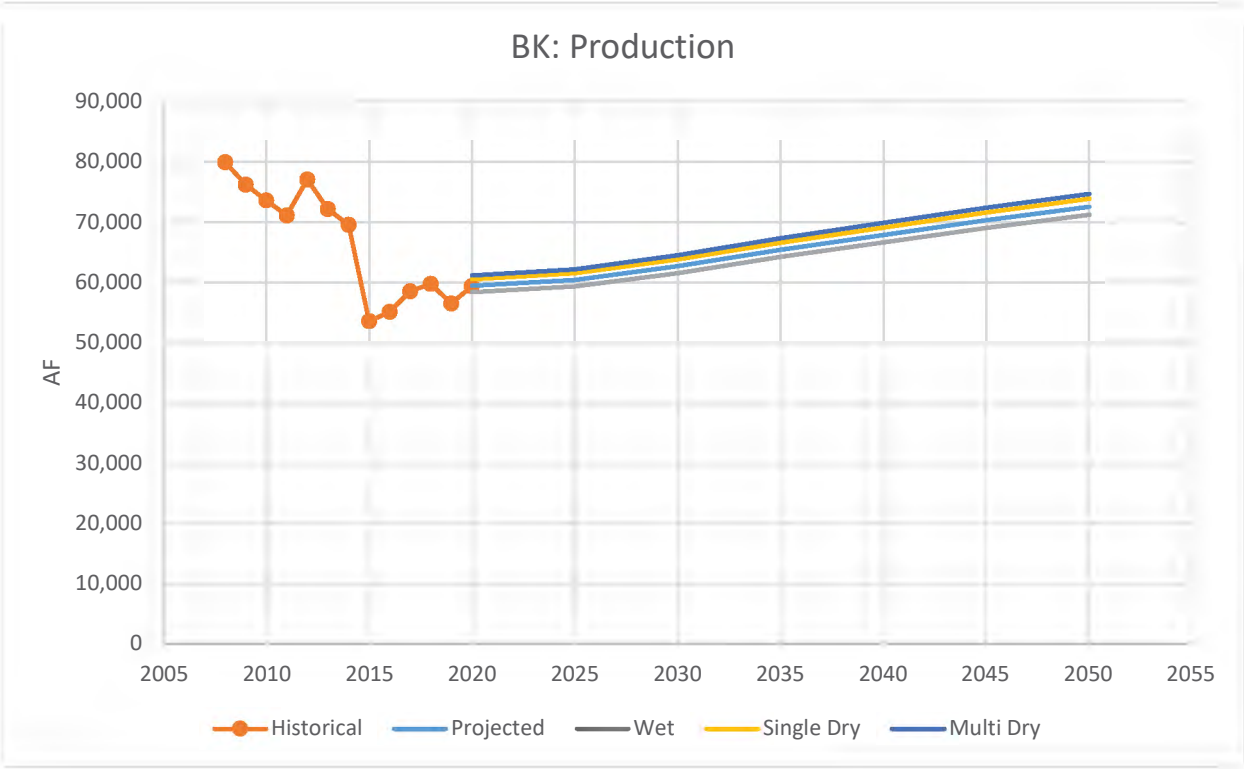
Normal, Single-Year, and Multi-Year Dry Year Demand

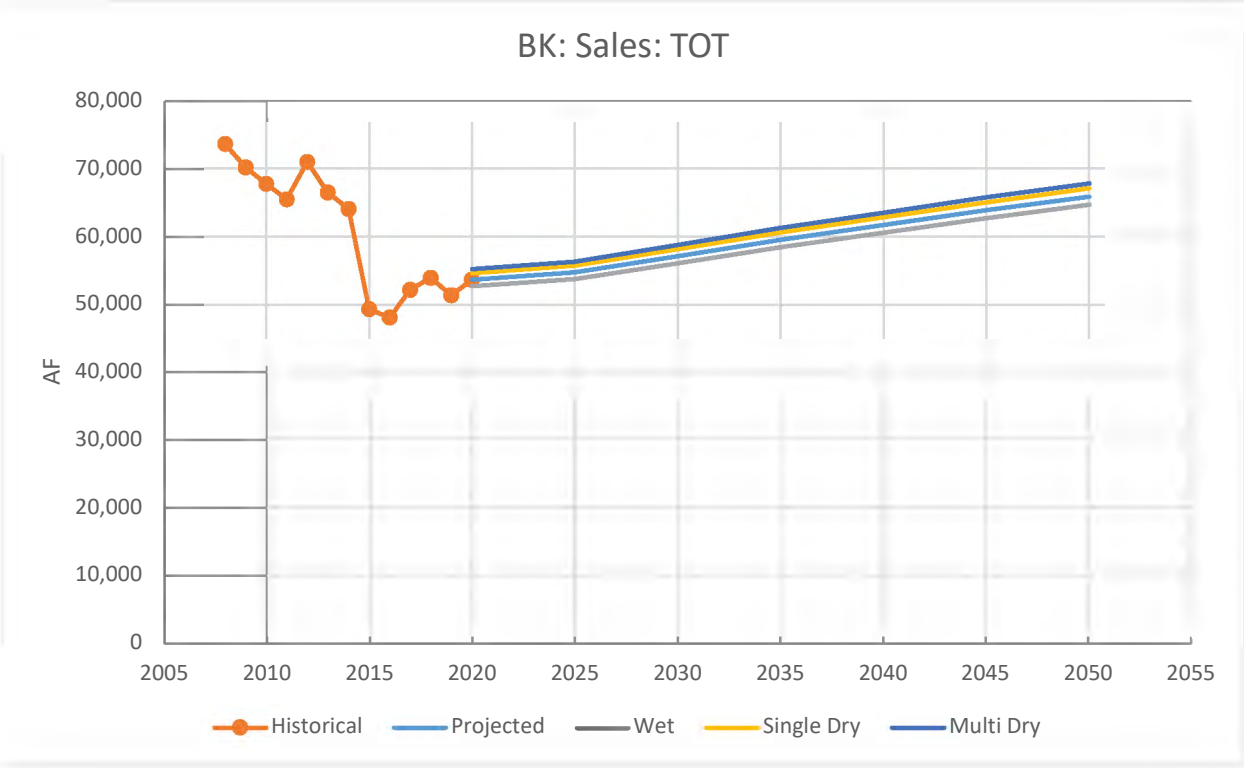
YEAR		NORMAL		SINGLE DRY YEAR	% OF NORMAL		MULTI DRY YEAR	% OF NORMAL
2020		59,481		60,543	102%		61,200	103%
2021		59,253		60,311	102%		60,965	103%
2022		59,497		60,560	102%		61,217	103%
2023		59,774		60,842	102%		61,503	103%
2024		60,071		61,144	102%		61,809	103%
2025		60,439		61,520	102%		62,188	103%
2026		60,909		61,999	102%		62,674	103%
2027		61,318		62,417	102%		63,097	103%
2028		61,747		62,854	102%		63,539	103%
2029		62,212		63,329	102%		64,020	103%
2030		62,681		63,807	102%		64,504	103%
2031		63,241		64,378	102%		65,082	103%
2032		63,768		64,916	102%		65,626	103%
2033		64,322		65,481	102%		66,198	103%
2034		64,870		66,039	102%		66,763	103%
2035		65,408		66,588	102%		67,318	103%
2036		65,915		67,104	102%		67,841	103%
2037		66,397		67,596	102%		68,339	103%
2038		66,899		68,108	102%		68,856	103%
2039		67,389		68,608	102%		69,362	103%
2040		67,871		69,100	102%		69,860	103%
2041		68,358		69,596	102%		70,362	103%
2042		68,852		70,101	102%		70,873	103%
2043		69,337		70,595	102%		71,373	103%
2044		69,835		71,103	102%		71,888	103%
2045		70,314		71,592	102%		72,382	103%
2046		70,784		72,070	102%		72,866	103%
2047		71,248		72,544	102%		73,346	103%
2048		71,695		73,000	102%		73,807	103%
2049		72,150		73,464	102%		74,277	103%
2050		72,561		73,883	102%		74,701	103%

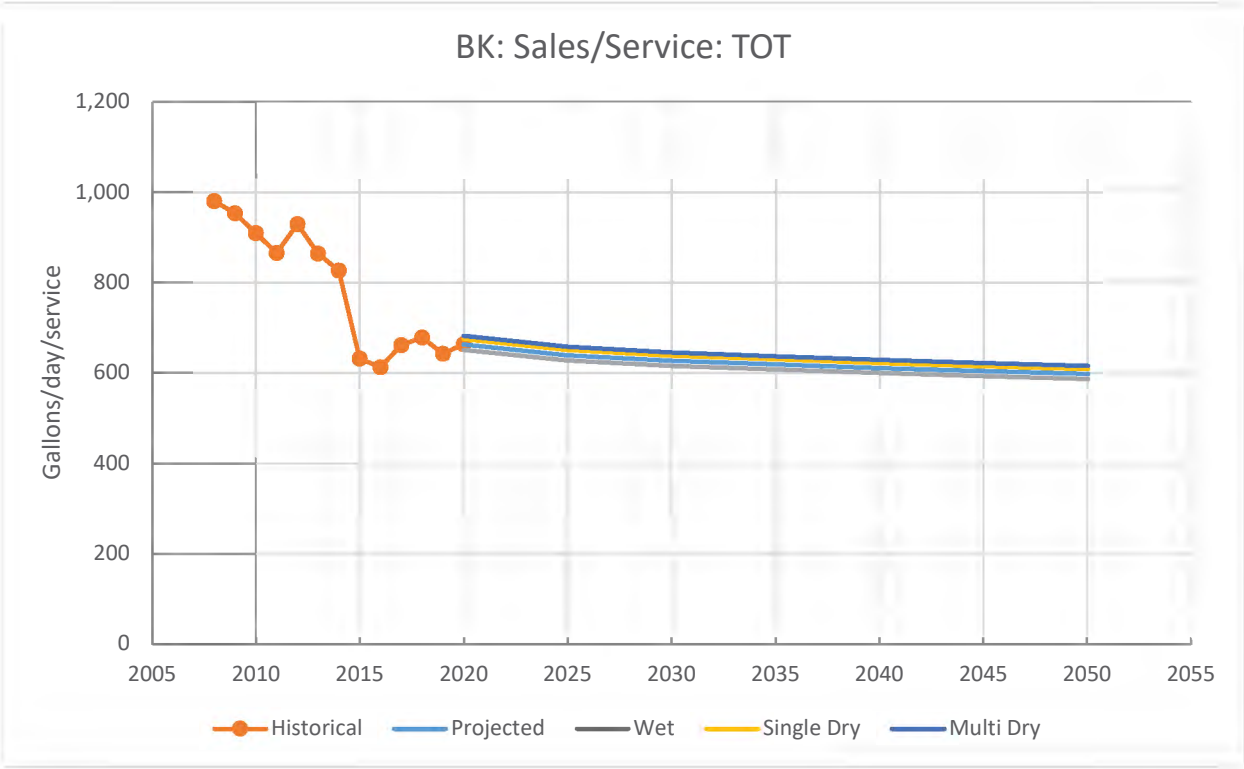
Charts

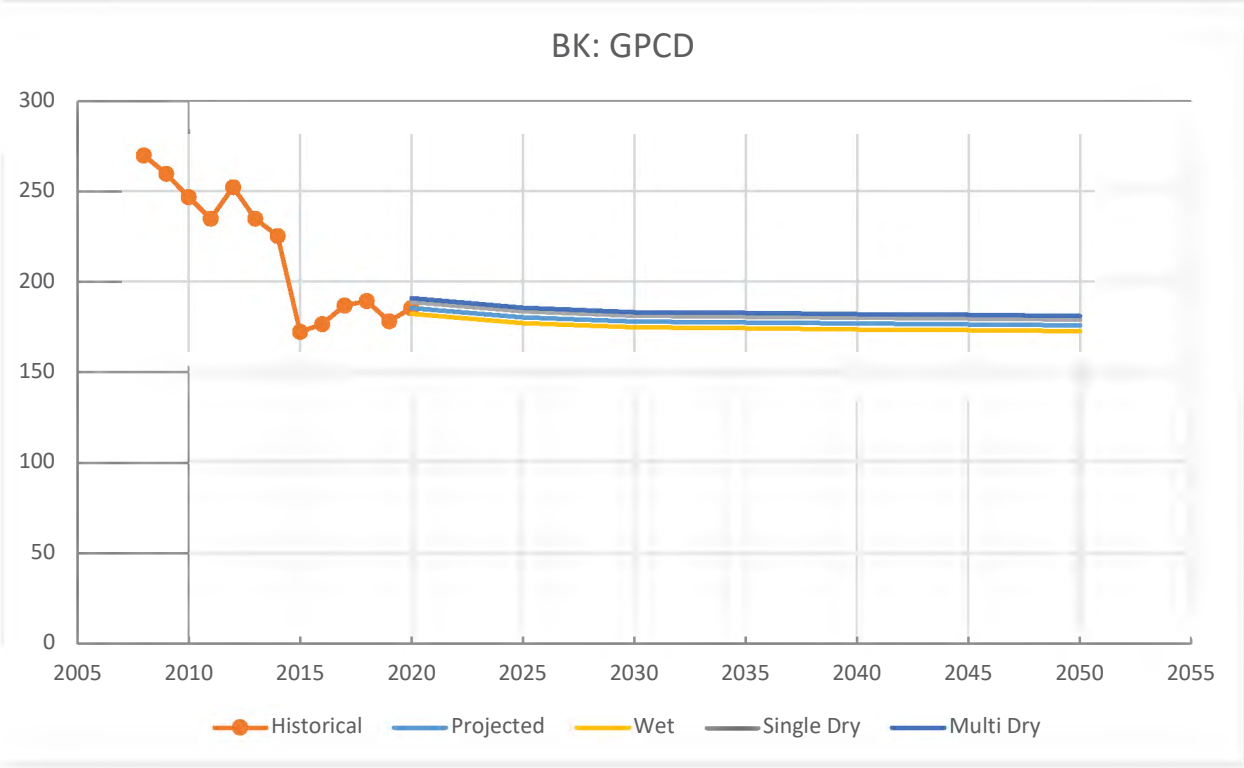

BK: Population
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected


BK: Services: TOT
120,000
100,000
80,000
60,000
40,000
20,000
0
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected


BK: Production
AF
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry


BK: Sales: TOT
AF
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry


BK: Sales/Service: TOT
Gallons/day/service
1,200
1,000
800
600
400
200
0
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry


BK: GPCD
300
250
200
150
100
50
0
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry

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Appendix E: DWR SB X7-7 Verification Forms

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Water Conservation Act of 2009
SB X7-7
Updated Verification Forms

Bakersfield District

2020 Urban Water Management Plan
Appendix E

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	79,918	Acre Feet
	2008 total volume of delivered recycled water	-	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[3]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☐	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review

NOTES: Cal Water uses a population estimation methodology based on overlaying Census Block data from the 2000 and 2010 Censuses with the District's service area. LandView 5 and MARPLOT software are used with these data to estimate population per dwelling unit for 2000 and 2010. The per dwelling unit population estimates are then combined with Cal Water data on number of dwelling units served to estimate service area population for non-Census years. Cal Water also estimated service area population using DWR's Population Tool. The estimates prepared using Cal Water's methodology and DWR's Population Tool differed by less than one percent. Cal Water is electing to use the population estimates produced by its methodology in order to maintain consistency with population projections it has prepared in other planning documents and reports.

SB X7-7 Table 3: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	1995	214,863
Year 2	1996	213,683
Year 3	1997	215,318
Year 4	1998	216,301
Year 5	1999	217,530
Year 6	2000	220,851
Year 7	2001	224,924
Year 8	2002	229,212
Year 9	2003	233,630
Year 10	2004	240,029
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	233,630
Year 2	2004	240,029
Year 3	2005	246,177
Year 4	2006	251,898
Year 5	2007	256,127
2015 Compliance Year Population		
2015		278,488

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	69,164			-		-	69,164
Year 2	1996	73,246			-		-	73,246
Year 3	1997	73,501			-		-	73,501
Year 4	1998	62,863			-		-	62,863
Year 5	1999	72,220			-		-	72,220
Year 6	2000	74,906			-		-	74,906
Year 7	2001	73,619			-		-	73,619
Year 8	2002	76,872			-		-	76,872
Year 9	2003	79,395			-		-	79,395
Year 10	2004	78,031			-		-	78,031
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**73,382**
5 Year Baseline - Gross Water Use								
Year 1	2003	79,395			-		-	79,395
Year 2	2004	78,031			-		-	78,031
Year 3	2005	75,679			-		-	75,679
Year 4	2006	80,709			-		-	80,709
Year 5	2007	80,633			-		-	80,633
5 year baseline average gross water use								**78,890**
2015 Compliance Year - Gross Water Use								
2015		53,602	-		-		-	**53,602**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)
Complete one table for each source.

Name of Source	Wells
This water source is:	
☑	The supplier's own water source
☐	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	53,524		53,524
Year 2	1996	60,044		60,044
Year 3	1997	59,507		59,507
Year 4	1998	50,194		50,194
Year 5	1999	59,704		59,704
Year 6	2000	61,961		61,961
Year 7	2001	61,566		61,566
Year 8	2002	65,645		65,645
Year 9	2003	58,278		58,278
Year 10	2004	51,586		51,586
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2003	58,278		58,278
Year 2	2004	51,586		51,586
Year 3	2005	49,856		49,856
Year 4	2006	52,499		52,499
Year 5	2007	53,889		53,889
2015 Compliance Year - Water into Distribution System				
2015		33,388		33,388

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	KCWRA & City of Bakersfield			
This water source is:				
☐	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1,995	15640.3755		15,640
Year 2	1,996	13201.8254		13,202
Year 3	1,997	13993.9942		13,994
Year 4	1,998	12669.6036		12,670
Year 5	1,999	12515.5946		12,516
Year 6	2,000	12945.1099		12,945
Year 7	2,001	12052.5271		12,053
Year 8	2,002	11226.4041		11,226
Year 9	2,003	21116.8874		21,117
Year 10	2,004	26445.047		26,445
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2,003	21116.8874		21,117
Year 2	2,004	26445.047		26,445
Year 3	2,005	25823.3978		25,823
Year 4	2,006	28210.0838		28,210
Year 5	2,007	26744.8068		26,745
2015 Compliance Year - Water into Distribution System				
2015		20,214		20,214
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	214,863	69,164	287
Year 2	1996	213,683	73,246	306
Year 3	1997	215,318	73,501	305
Year 4	1998	216,301	62,863	259
Year 5	1999	217,530	72,220	296
Year 6	2000	220,851	74,906	303
Year 7	2001	224,924	73,619	292
Year 8	2002	229,212	76,872	299
Year 9	2003	233,630	79,395	303
Year 10	2004	240,029	78,031	290
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**294**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	233,630	79,395	303
Year 2	2004	240,029	78,031	290
Year 3	2005	246,177	75,679	274
Year 4	2006	251,898	80,709	286
Year 5	2007	256,127	80,633	281
5 Year Average Baseline GPCD				**287**
2015 Compliance Year GPCD				
2015		278,488	53,602	**172**

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	294
5 Year Baseline GPCD	287
2015 Compliance Year GPCD	172

SB X7-7 Table 7: 2020 Target Method
Select Only One

Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
294	**235**

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target

5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
287	273	235	**235**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

SB X7-7 RA1 - Weighted Baseline				
Participating Member Agency Name *Add rows as needed*	**10-15 year Baseline GPCD***	**Average Population During 10-15 Year Baseline Period**	**(Baseline GPCD) X (Population)**	**Regional Alliance Weighted Average 10-15 Year Baseline GPCD**
Cal Water - Bakersfield District	294	222,634	65,454,468	
Cal Water - Kern River Valley Dis	205	6,155	1,261,737	
Cal Water - Selma District	273	21,972	5,998,394	
Cal Water - Visalia District	247	111,268	27,483,268	
Regional Alliance Total	1,019	362,029	100,197,867	**277**

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable.These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

NOTES

SB X7-7 RA1 - Weighted 2020 Target				
Participating Member Agency Name *Add rows as needed*	**2020 Target GPCD***	**2020 Population**	**(2020 Target) X (Population)**	**Regional Alliance Weighted Average 2020 Target**
Cal Water - Bakersfield District	235	286,310	67,282,908	
Cal Water - Kern River Valley District	179	5,501	984,679	
Cal Water - Selma District	218	26,157	5,702,299	
Cal Water - Visalia District	198	147,032	29,112,298	
Regional Alliance Total	830	465,000	103,082,184	**222**

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable.These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

NOTES

Appendix F: Climate Change Studies – Executive Summaries

- Climate Change – Water Resource Monitoring and Adaptation Plan – Phase 1
- Potential Climate Change Impacts on the Water Supplies of California Water Service

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Climate Change-Water Resource Monitoring and Adaptation Plan – Phase 1

December 17, 2020

California Water Service
1720 North First Street
San Jose, CA 95112

Submitted by:
ICF
555 W 5th St
Suite 3100
Los Angeles, CA 90013

Executive Summary

Shifts in the frequency and severity of natural hazards resulting from climate change, often referred to as climate hazards, increasingly threaten water resources in California. These relevant climate hazards include reductions to snowpack, greater concentrations of precipitation in both a shorter rain season and isolated atmospheric river events, and more volatility between wet and dry water years.

To identify and prepare for impacts from these hazards, California Water Service (Cal Water) is seeking to identify climate change vulnerabilities to water supplies, operations and facilities, and to develop adaptation strategies to address those vulnerabilities through a Climate Change Water Resources Monitoring and Adaptation Plan. This body of work is intended to provide Cal Water with information to inform decisions on water system/asset management and resource planning to better prepare for and respond to current and projected changes to climate. This work represents a forward-looking approach in addressing climate risks for California utilities, as the large majority of water wholesaler and utilities have not completed climate vulnerability and adaptation plans.

In the first phase of this effort, the ICF team collaborated with Cal Water to conduct a literature and tools review as the foundation for subsequent phases of work. In Phase 2 of this project, the ICF team and Cal Water will undertake a vulnerability assessment of Cal Water's facilities and operations by developing an assessment approach that evaluates climate impacts to Cal Water, identifies asset vulnerabilities, and prioritizes climate risks. Phase 3 will focus on an assessment of climate-driven impacts to water supply resources and demand. This first phase of research and assessment will provide Cal Water with a clear "lay of the land" in understanding available methodologies and lessons learned in conducting vulnerability assessments and developing adaptation plans in the water sector. This work can provide key insights for Cal Water, industry practitioners, and Cal Water customers on best practices and needs in climate vulnerability and adaptation efforts.

This first phase will also act as a foundation for Cal Water to build on in subsequent phases of work. ICF and Cal Water will build on research and findings developed in Phase 1 to define the scope of Phases 2 and 3.

In Phase 1, the ICF team undertook three areas of review:

1) Literature and tools related to adaptation planning by water suppliers and other relevant organizations
2) Methods and data in Cal Water's 2016 Vulnerability Study "Potential Climate Change Impacts on the Water Supplies of California Water Service"
3) Climate change impact assessments and adaptation plans beyond Cal Water (wholesalers, state agencies) that could affect Cal Water's vulnerability or adaptive capacity

In the first part of our assessment, the studies we reviewed conclude that there is high certainty of climate-driven reductions to snowpack, wetter winter months, and more volatility between wet and dry water years. While California water systems are designed to operate under a wide

range of hydrologic conditions, they are not designed to absorb and adapt to the projected levels of change, which could have impacts on historical supplies from reservoir systems and groundwater systems. These studies also revealed a suite of potential approaches to vulnerability assessment and risk assessment that are applicable to Phases 2 and 3.

Key studies that the ICF team referenced include Brown and Caldwell's "Impacts of Climate Change on Honolulu Water Supplies and Planning Strategies for Mitigation", the Water Research Foundation's (WRF)'s "Mapping Climate Exposure and Climate Information Needs to Water Utility Business Functions", the Metropolitan Water District's (MWD)'s "2015 Integrated Water Resources Plan" and "2015 Urban Water Management Plan", and the U.S. Environmental Protection Agency's (EPA's) Climate Resilience Evaluation and Awareness Toolkit (CREAT).

In the second part of our review, we found that Cal Water's 2016 Climate Change Vulnerability Study undertook a high-level investigation of impacts of climate change on water supply, including surface water, groundwater, and imported water throughout Cal Water service areas. However, the study did not use uniform metrics across water suppliers, was unable to apply the currently available downscaled climate projections, and did not consider the full suite of potential climate impacts to Cal Water's systems, including impacts of compounding climate hazards and impacts on Cal Water facilities and operations.

In the third part of this work, the ICF team researched and assessed existing climate vulnerability assessments and adaptation efforts that have an impact on Cal Water's ability to mitigate impacts from climate change. This included efforts by water supply wholesalers connected to Cal Water's system, and state agencies that regulate Cal Water's supplies, operations, and planning efforts. This will allow Cal Water to build on existing actions and avoid recreating adaptation efforts that are planned or have been implemented.

Cal Water has undertaken key steps toward adaptation planning since the 2016 Vulnerability Study, such as this work to provide additional vulnerability analysis, working locally to identify and prepare to meet Sustainable Groundwater Management Act (SGMA) requirements, and coordinating with wholesalers on their identified climate-driven vulnerabilities. Phases 2 and 3 of this work will further frame system vulnerabilities within an adaptation planning context for a flexible and anticipatory response.

The ICF team's literature review focused on identifying approaches for assessing water utility vulnerabilities of assets and water resources, and adaptation planning needs (summarized in Table 1). To identify these priority approaches, the team reviewed a list of publications with input from Cal Water on key sources. We reviewed and analyzed the relevant literature for applicability to Cal Water, the advantages and fit within a robust plan for assessment, and the potential disadvantages. We highlighted those approaches in the sections on key takeaways and the applicability of approaches to Cal Water. Table 1 provides important considerations raised by the ICF team during this process.

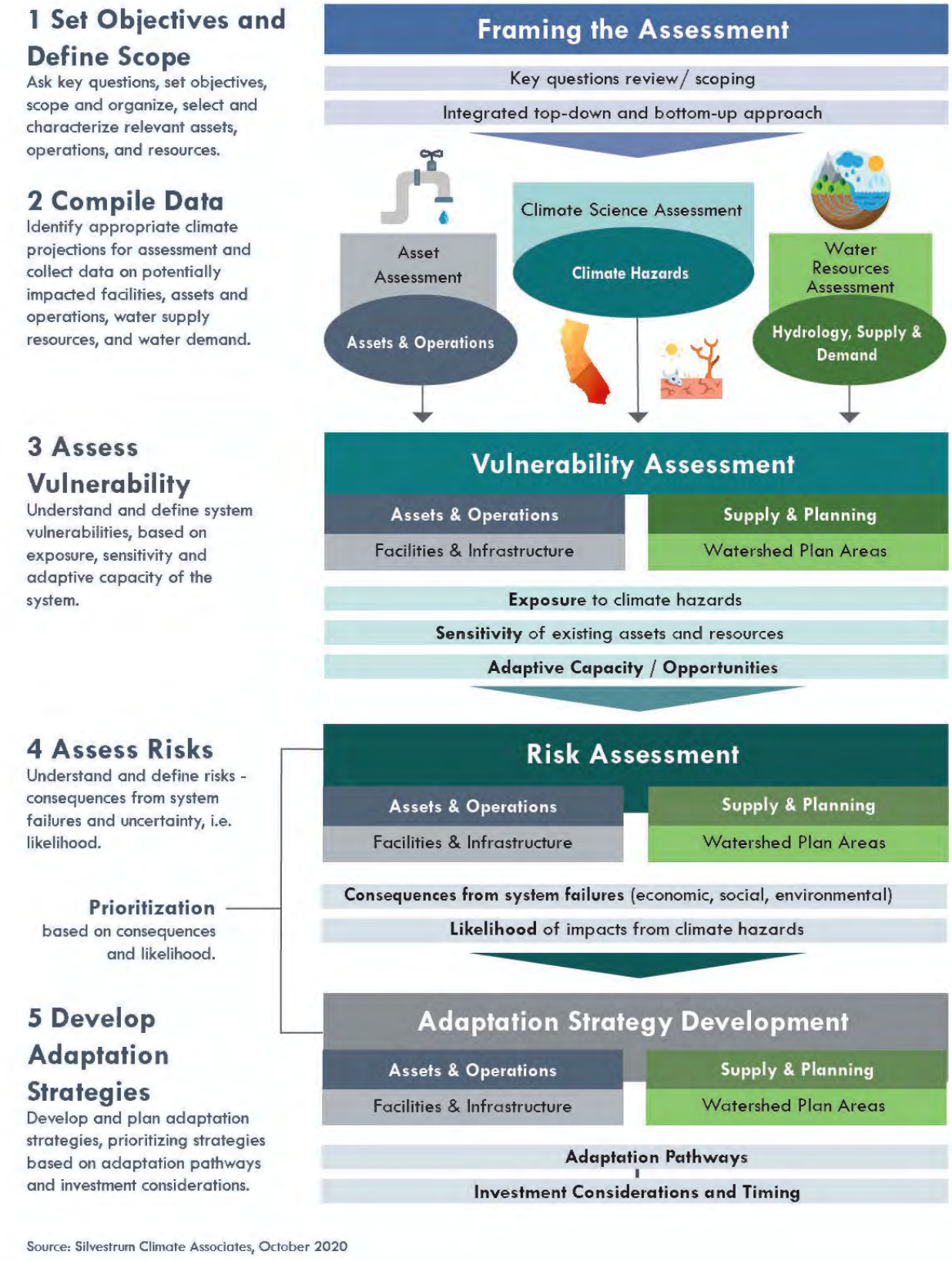
Table 1: Advantages and disadvantages of identified approaches

Identified Approach	Advantages	Disadvantages
Integrated resource-level (i.e., top-down) and asset-level (i.e., bottom-up) approaches to vulnerability assessment	• Allows for matching available information with appropriate methodologies • Supports evaluation of vulnerabilities in both water supply resources and physical systems: an integrated approach can help to address gaps in either area	• Bottom-up approaches can require extensive historical data and asset-level data • Integration of climate projections into hydrological models can be challenging. For example, data inputs for hydrological models and the outputs from climate projections may be incompatible or require additional data processing
Robust Decision-Making	• Supports identification of decisions for response under a range of potential climate futures • Supports alignment between climate impacts and operating units/business functions • Ensures the scope focuses on critical services, assets, and resources • Supports the development of adaptation pathways and measures • Provides a framework for information that can signal the need for critical decisions on adaptation	• Involves significant investment of time to identify performance metrics, business functions, and key variables • Even with significant time invested on the front end, scope can change and require rescoping later in the effort • Requires a strong understanding of utility decision-making
Applying climate projections to hydrologic modeling, future demand and planning scenarios	• Generates better understanding of impacts of extreme scenarios, snowpack loss, drought, increased temperatures, precipitation whiplash, and other hydrologic changes in water supply resources and downstream demands • Allows for modeling of a range of climate scenarios to better account for uncertainties in resource management and climate outcomes • Integrates climate projections with scaled historical time series data	• Can require substantial data, and may introduce bias (due to selected climate scenarios) • It is necessary to identify performance metrics and thresholds related to available climate variables; these can be difficult to identify and thresholds may not exist • Relies on necessary simplifying assumptions to model complex hydrologic systems
Stress testing and scenarios	• Supports management of uncertainty, especially in the absence of data • Allows for understanding of climate impacts on system performance within a risk framework	• Can require refined climate information (e.g. hydrological variables) and detailed asset information • Can require the integration of climate information into hydrological models, which may require

Identified Approach	Advantages	Disadvantages
	• Supports identification of major performance metrics and their potential for failure • Helps in understanding how the severity of impacts varies for facilities, operations, and water supplies under different climate change conditions.	significant data processing to be compatible with one another • Can result in qualitative or directional findings that don't provide straightforward adaptation responses
Engaging staff in climate change vulnerability assessments and adaptation plans	• Provides perspective for setting study parameters • Provides targeted input and data into assessment • Identifies existing data gaps and actions to address gaps • Supports development of institutional capacity for monitoring impacts, adaptation planning, and implementation	• Can be time-consuming for team members attending workshops and interviews; requires a targeted approach to ensure efficiency and that the right data is captured • Requires cross-team coordination that may be outside of "normal" communication pathways, e.g. between engineers and policy specialists
Evaluating costs of inaction	• Helps to prioritize adaptation planning needs • Creates a better understanding of the risks to Cal Water	• Requires scaling information on past costs without clear data on future impacts, creating uncertainties in estimates
Use of Flexible Adaptation Pathways	• Helps to select appropriate timing (including lead time from planning to implementation) and application of adaptation measures • Considers and compares multiple strategies in adaptation planning • Includes triggers that signal when decision-makers should decide on switching to another pathway • Allows for adaptive decisions under uncertainty by integrating points for re-assessing pathway and actions • Considers alternative external developments over time	• Does not provide a fixed timeline for actions • This approach is relatively new and may require coordination with budget cycles and external policy updates, since actions evolve over time • May push decision burden onto future decision-makers who did not develop original pathway

Our team synthesized these identified methodologies, findings, and insights into an overarching approach for characterizing climate vulnerabilities and planning for adaptation at both an asset level and water supply planning level to suit Cal Water's needs in addressing climate change impacts, shown in Figure 1.

Figure 1: Climate Assessment Framework



Source: Silvestrum Climate Associates, October 2020

Based on this review, the ICF team is making the following key recommendations for guiding Cal Water's efforts in identifying climate vulnerabilities and planning for adaptation:

- **Apply a standard conceptual framework to vulnerability assessment which integrates both top-down analysis and bottom-up analysis (see Figure 1).** The standard conceptual framework for assessing climate vulnerabilities and risks includes understanding exposure, sensitivity, and adaptive capacity, and potential impacts as components of vulnerability, and consequence and likelihood as components of risk. Top-down analysis would begin by applying downscaled Global Climate Model (GCM) projections to assess impacts on water supply resources and the bottom-up analysis would begin by identifying system sensitivities to climate hazards. These analyses are complementary.
- **Use a robust decision making (RDM) framework for vulnerability assessment and adaptation planning** by seeking to identify decisions for response under a range of potential climate futures, mapping impacts on operating units/business functions, and ensuring that the scope focuses on critical services, assets, and resources. A robust decision-making framing will support the development of adaptation pathways and measures by monitoring information that signals the need for critical decisions on adaptation.
- **Engage staff and key stakeholders in the planning process** to gain a holistic planning perspective for setting study parameters, providing targeted input into assessment and plan development, and supporting institutional capacity for adaptation.
- **Build off of the 2016 Cal Water Climate Change Impact study by applying updated climate models and projections for additional hydrologic variables** to hydrologic modeling, future demand and planning scenarios, and scaled historical time series data to better understand impacts of extremes, precipitation whiplash, and other hydrologic changes in water supply resources. We recommend presentation of this with uniform metrics for more actionable findings.
- **Assess climate impact consequence by stress-testing key water system performance metrics.** This includes developing a range of impact scenarios to understand how the severity of impacts varies for facilities, operations, and water supplies under different climate change conditions.
- **Evaluating the order of magnitude cost of inaction.** We recommend communicating consequences in terms of direct costs to Cal Water and customers without adaptation actions to prioritize adaptation response.
- **Follow a step-by-step, iterative process to adaptive management which fully aligns with potential exposure to climate hazards and vulnerabilities**, including:
    - Utilizing Flexible Adaptation Pathways in planning for selecting appropriate timing and application of adaptation measures
    - Planning for monitoring and evaluation
    - Evaluating adaptation investment decisions

During Phases 2 and 3 in which Cal Water and the ICF team will further assess vulnerability, we will frame the study outputs within a decision-making context for compatibility with adaptation planning concepts and eventual investment in adaptation measures.

Potential Climate Change Impacts on the Water Supplies of California Water Service

Prepared by

Gary Fiske and Associates, Inc.
Balance Hydrologics, Inc.

January 2016

Executive Summary

Introduction

California Water Service Company (Cal Water) provides water service to roughly 478,000 customers – about 1.7 million people – located in 83 state-wide communities in 24 service districts. Cal Water's districts rely on a variety of supply sources, including local groundwater, local surface water, and imported supplies. It is critical for Cal Water to gain a better understanding of the potential impacts of climate change on the availability of those supplies. Impacts are inherently uncertain, but Cal Water believes that the only responsible course is to carefully incorporate climate change into its ongoing water supply planning.

The present project and report represent a first step in that path. In order for Cal Water to determine how its long-term water supply planning should reflect climate change impacts, it must first have an understanding of what the impacts of climate change on its supply sources might be. That is the purpose of this study.

The work reported on here focuses on the sample of Cal Water districts highlighted in Figure ES-1. These districts account for 85% of Cal Water's total 2014 production and reflect the diversity of all Cal Water districts, including geographic, hydrologic, and climatic conditions and primary and secondary supply sources.

Changes in climate can affect the availability of local groundwater and surface water supplies, as well as purchased imported supplies. This study separately addresses the impacts on each of these for each sample district. It relies on the best available projections of changes in climate (temperature and precipitation) through the end of the century. It then uses the climate projections to examine how surface water flows and groundwater recharge rates may change.

For imported supplies, this study relies on studies already completed by wholesale providers where possible. Where no such studies have been done or where the data from such studies was unavailable, other approaches were developed to estimate climate change impacts on these supplies.

The results reported here provide an integrated view of how projected climate changes may affect water supply availability for Cal Water's service districts. The results also represent a first step in integrating potential future climate change impacts into Cal Water's ongoing supply planning. Because of the inherent uncertainties, a nuanced risk assessment may be needed to guide the incorporation of these results into long-range planning. Beyond the Company's supply/infrastructure planning, the results also can affect the Company's triennial General Rate Cases; they may also have potential operational implications.

Figure ES- 1. Cal Water Service Districts with Sample Districts Highlighted



Estimating Changes in Climate

Climate change is primarily driven by increased concentrations of greenhouse gases (GHGs) in the atmosphere. The trajectory of future climate change is a function of the rate at which those concentrations are projected to increase and the manner in which the atmosphere and oceans respond to increased concentrations. Both are difficult to model. Thus, while the scientific community overwhelmingly agrees that climate change will occur (and indeed may already have begun), the trajectory of those changes is very uncertain.

The projections of temperature and precipitation that underlie this study are based on 40 of the latest Global Circulation Models (GCMs) run as part of the Coupled Model Intercomparison Project Phase 5 (CMIP5). Generally speaking, this type of approach is termed an ensemble analysis, for which the downscaled climate projections for any particular Cal Water Service District were based on the median of the 40 downscaled GCM datasets. The GCMs used by the analysis are driven by two GHG emission pathways that bound the possible trajectories of GHG concentrations.

Impacts of Climate Change on Water Supplies

The supplies for each district consist of a mix of local surface water, local groundwater, and/or purchased imports. Climate change impacts were estimated for each of these components. The approaches used for each are described below. Based on the breakdown of district production among the supply sources, Table ES-1 shows the ranges of projected overall climate change impacts on available supply, relative to the historic average.[1] Table ES-2 groups this vulnerability into 4 categories of expected change, and Figure ES-2 maps the end-of-century vulnerability.

[1] The historical averages used here, and elsewhere in this report, are based on the entire range of historical data available for the district-specific analyses. These ranges vary across districts, and are specified within the district-specific technical memoranda.

Table ES- 1. Projected Changes in Available Supply due to Climate Change

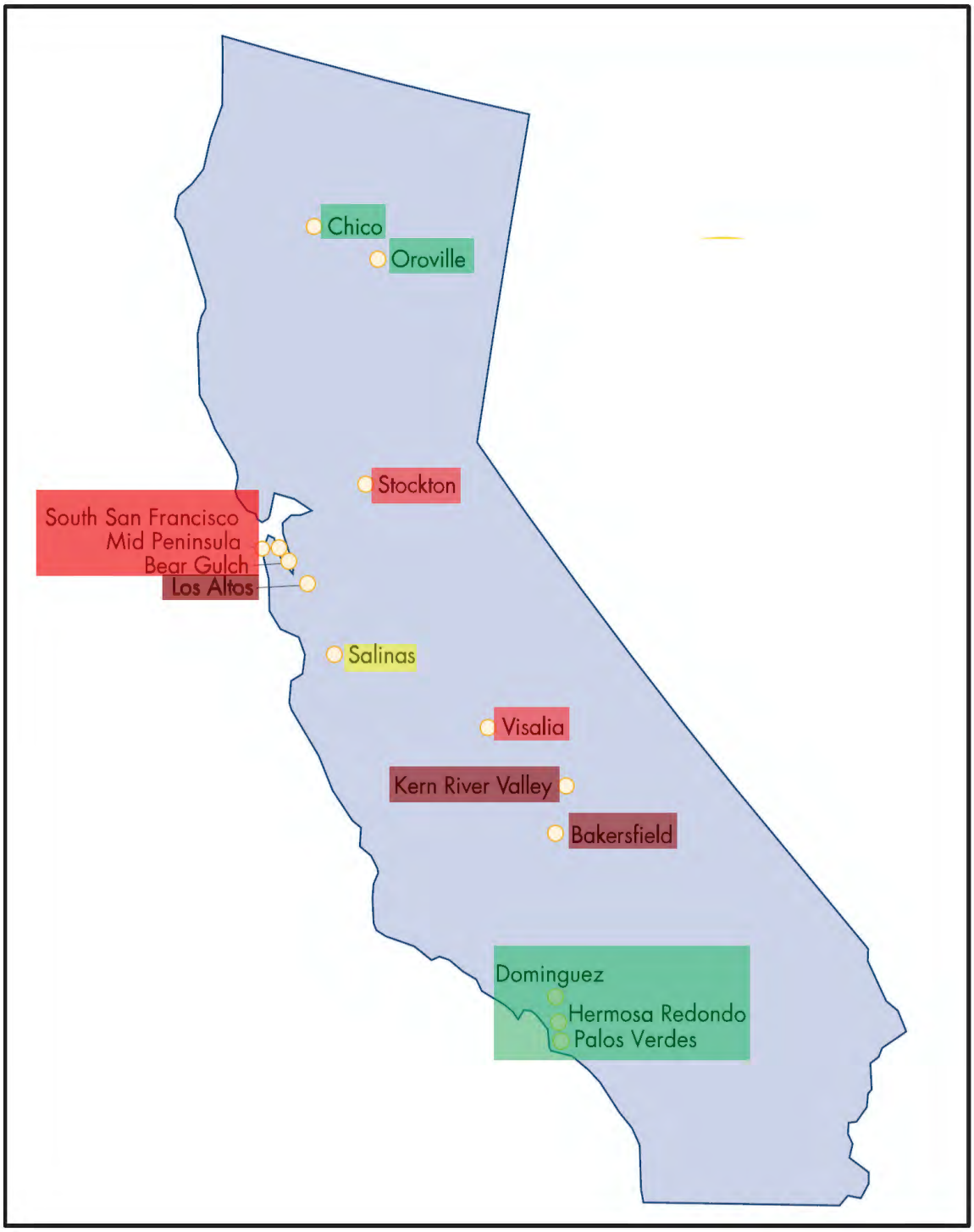
District		Percentage Change in Supply		
		2020	2050	2100
BK	Minimum	-10%	-10%	-12%
	Maximum	-12%	-16%	-20%
VIS	Minimum	-7%	-8%	-8%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13%	-16%	-19%
	Maximum	-16%	-21%	-31%
MPS/SSF/BG	Minimum	0%	-2%	-6%
	Maximum	0%	-7%	-15%
LAS	Minimum	-3%	-3%	-10%
	Maximum	-4%	-18%	-28%
CH	Minimum	2%	2%	0%
	Maximum	3%	1%	-3%
ORO	Minimum	0%	8%	5%
	Maximum	0%	-8%	-7%
DOM/HR/PV	Minimum	0%	0%	-1%
	Maximum	0%	-2%	-3%
STK	Minimum	0%	0%	-8%
	Maximum	0%	-14%	-17%
SLN	Minimum	-6%	-6%	-6%
	Maximum	-7%	-7%	-7%

Table ES- 2. Categories of Projected Supply Vulnerability

District	Supply Vulnerability		
	2020	2050	2100
KRV	3	4	4
BK	3	3	4
LAS	1	3	4
VIS	2	2	3
STK	1	2	3
SLN	2	2	2
MPS/SSF/BG	1	1	3
DOM/HR/PV	1	1	1
ORO	1	1	1
CH	1	1	1

Districts in Category 1 expect <5% reduction in supply. Category 2 indicates a reduction of 5-10%. Category 3 indicates an expected reduction of 10-15%. Category 4 reductions exceed 15%.

Figure ES- 2. Cal Water 2100 Vulnerability to Climate Change



Vulnerability levels:
Green = Low
Yellow = Moderate
Light Red = High
Dark Red = Very High

Estimating Climate Change Impacts on Local Surface Supplies

For those Cal Water districts that obtain a portion of their water supplies from local surface water, projected average annual precipitation in each of three forecast years (2020, 2050, 2100) were compared to historical precipitation to estimate the projected average annual discharge for that forecast year. Table ES-3 shows the estimated percent changes in surface water availability compared to historical averages.

Table ES- 3. Estimated Impacts on Local Surface Supply Availability

District		Percent Change in Runoff		
		2020	2050	2100
BK	Minimum Impact	-17%	-18%	-19%
	Maximum Impact	-18%	-19%	-23%
KRV	Minimum Impact	-17%	-18%	-19%
	Maximum Impact	-18%	-19%	-23%
MPS/SSF/BG	Minimum Impact	+3%	+6%	+12%
	Maximum Impact	+3%	+5%	+6%

Of the three districts, the two in the southern San Joaquin Valley are projected to experience significant reductions in their local surface supplies. In contrast, the Bear Gulch district surface supply is forecast to increase.

Estimating Climate Change Impacts on Local Groundwater Supplies

Climate change impacts on Cal Water's local groundwater supplies result from changes in projected groundwater recharge. The three groundwater recharge components include:

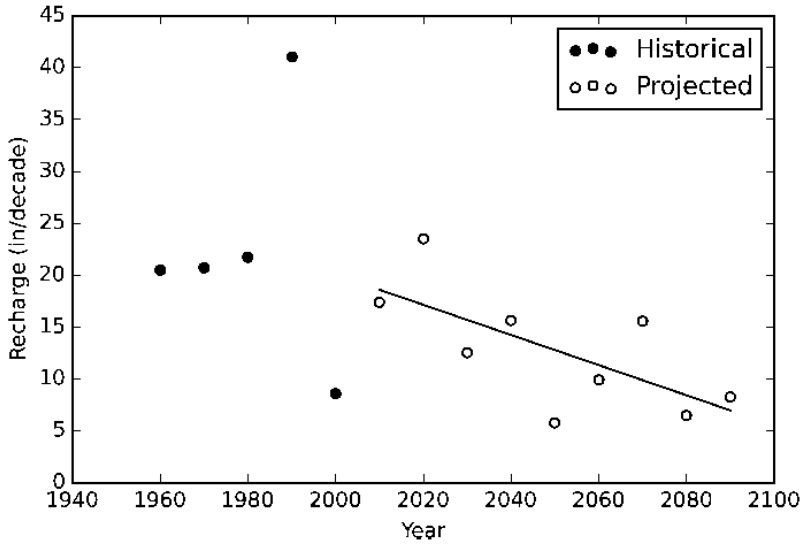
- Local river sources;
- Direct recharge from precipitation on the groundwater basin; and
- Recharge from agricultural and urban deep percolation.

The analysis first estimated the split of local recharge among these three components using geographic and geologic data, geochemical markers, and previously published reports and other supporting information. The climate change impacts on each component were then estimated, consolidated into overall projections of recharge impacts, and compared to estimated historical recharge rates.

Estimates of impacts on river recharge used the methodology for local surface supply described above. For the purposes of this phase of work, it was assumed that the change in recharge from the river is proportional to the change in total annual discharge. The estimated amount of water that will recharge directly into a groundwater basin from rain (or snow) is based on a balance of evapotranspiration (ET), precipitation rates, and soil

water capacity. Recharge is estimated using both historical and projected precipitation and temperature data. Decadal averages in projected recharge are then used to calculate long-term trends. This is illustrated in Figure ES-3 for Kern River Valley.

Figure ES- 3. Historic and Projected Decadal Direct-Precipitation Recharge for Kern River Valley



A quantitative projection of recharge from deep percolation beneath irrigated fields and urban areas is beyond the scope of this phase. Instead, districts for which a significant proportion of recharge is from agricultural and urban water are identified and expected trends under climate change of this water source for those districts are estimated. At-risk service areas with decreasing agricultural and urban water sources can be explored further in future work.

The estimated percentage impacts on each of the recharge components are multiplied by the expected fractions that each component is of total recharge to calculate the range of expected recharge reductions. Table ES-4 shows those results for each district, excluding the impacts of urban/agricultural applied water percolation.

Actual impacts on Cal Water's ability to pump groundwater may be less than these recharge reductions because the storage volumes in different basins have differing degrees of responsiveness to changes in recharge. The degree to which changes in recharge volumes translate into available groundwater supply is a function of the hydrogeologic attributes of the basin. A detailed understanding of those characteristics would require a level of modeling that is well beyond the scope of this phase of work. Instead, the estimates of basin responsiveness were based on the historical record of how the basin's water level has varied with recent climate variability. For some districts, the basin appears to be highly responsive, while for others changes in climate do not have much impact.

Table ES- 4. Projected Changes in Average Annual Groundwater Recharge

District		Percentage Change in Recharge		
		2020	2050	2100
BK	Minimum	-14%	-15%	-15%
	Maximum	-14%	-15%	-18%
VIS	Minimum	-9%	-10%	-11%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13.4%	-19%	-23%
	Maximum	-15%	-22%	-35%
MPS/SSF/BG	Minimum	-2%	-4%	-6%
	Maximum	-2%	-6%	-12%
LAS	Minimum	-7%	-8%	-13%
	Maximum	-8%	-18%	-25%
CH	Minimum	6%	4%	1%
	Maximum	6%	2%	-4%
ORO	Minimum	0%	0%	0%
	Maximum	0%	0%	0%
DOM/HR/PV	Minimum	0%	0%	0%
	Maximum	0%	0%	0%
STK	Minimum	-2%	-3%	-6%
	Maximum	-2%	-4%	-7%
SLN	Minimum	-7%	-7%	-7%
	Maximum	-7%	-7%	-7%

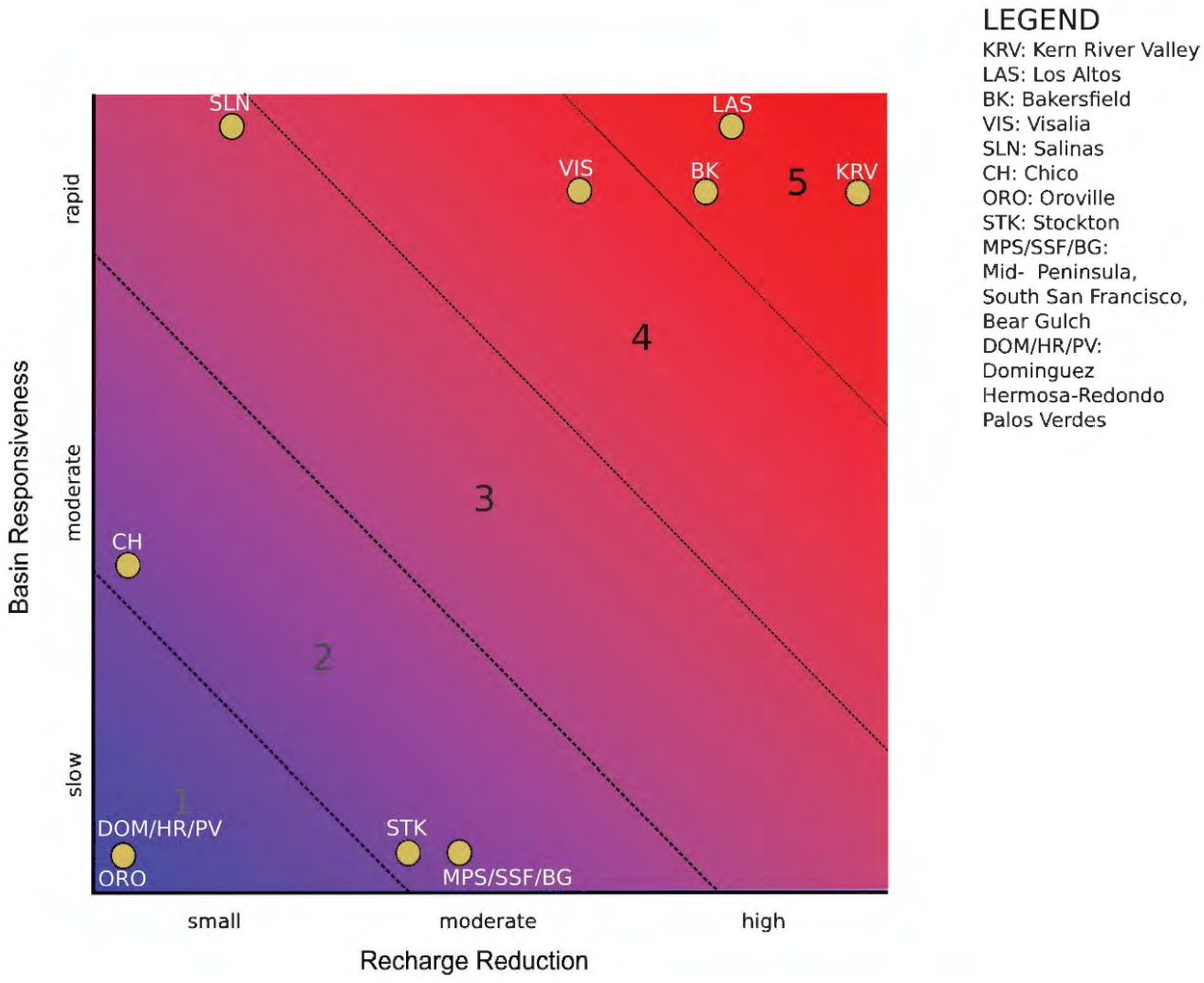
The overall risk to Cal Water's groundwater supplies for each district is based on the expected recharge reductions and the expected responsiveness of basin water level to those reductions. Table ES-5 rates each district's groundwater supply risk on a 1-5 scale, with 1 indicating little or no risk and 5 indicating high risk. Figure ES-4 is a visual depiction of these ratings.

Generally speaking, the groundwater supply impacts are large for the districts in the southern San Joaquin Valley. The Los Altos District also shows a high impact, largely because a significant portion of its recharge is from imported supplies, which are forecast to decrease significantly. Further north in the Central Valley, groundwater supplies are less affected. The Bay Area and Los Angeles Basin districts also show relatively smaller impacts.

Table ES- 5. District Groundwater Risk Ratings

District	Rating
BK	5
KRV	5
LAS	5
VIS	4
SLN	3
CH	2
MPS/SSF/BG	2
STK	2
ORO	1
DOM/HR/PV	1

Figure ES- 4. Groundwater Risk Ratings



Impacts of Climate Change on Imported Water Supplies

About half of Cal Water's supply is imported water that is purchased from wholesale suppliers. The supply and delivery systems of these suppliers are generally very complex and it is impossible within the confines of this project to independently model the impacts of climate change on those systems. The analysis therefore relied on available data, including the results of any climate change modeling that these suppliers themselves have done and other indicators of climate change impacts.

As a result, the climate change scenarios on which the estimates of impacts on different wholesale supplies are based will differ from one another and from the approach described above for the analysis of local supply impacts. The time frames of the results also differ. However, despite those limitations, important information about potential future climate change impacts on wholesale water supply availability was developed. Table ES-6 compares summary measures of central tendency for the potential district-specific climate change impacts on the availability of imported supplies.

Table ES- 6. Projected Climate Change Impacts on Imported Supplies

District	Source	Mid-Century	Late-Century
BK	SWP	-7%	-17%
LAS	SWP, CVP	-9%	-21%
ORO	SWP	-1%	-3%
MPS/SSF/BG	SFPUC	-10%	-20%
DOM/HR/PV	MWD	-1% to -2%	-2% to -5%
STK	USBR	-5%	-10%

Conclusions and Next Steps

The study results indicate significant risks for some districts. This points to the need for Cal Water to account for these risks in its future water supply planning if it is to minimize the adverse effects on its customers. The sole focus of this effort was to assess the potential climate change impacts on Cal Water's supplies. That is an important first step in integrating climate change into supply planning, but this study was not designed to:

- Analyze the impacts of these future supply limitations on Cal Water's ability to serve future customer demands. This is a function of such factors as water rights and contractual arrangements, how future demands are forecast to grow, how water conservation programming will affect those demands, and how Cal Water might modify the manner in which it operates its system.

- Develop mitigation plan to evaluate how potential supply and infrastructure investments and/or acquisition of new supplies might address any adverse impacts on water supply reliability.

- Formally assess alternative approaches to incorporating climate change in Cal Water's supply planning.

Possible next steps for Cal Water include:

- Methodological enhancements to reduce some of the uncertainties in the results reported herein;

- Development and acquisition of better and more complete data;

- Extending this study to other Cal Water districts;

- Developing a plan to mitigate anticipated climate change impacts on supply; and

- Integrating climate change into the Company's ongoing water supply planning.

Despite the study's limitations and uncertainties, three critical messages emerge:

- Cal Water supplies in the 21st century are likely to be adversely affected by climate change.

- These impacts will vary considerably across districts, depending on geography and source mix. For some districts, the impacts can be significant; for others, little or no impacts are projected.

- The impacts will generally increase over time. Anticipated late-century impacts are forecast to be significantly higher in some districts than impacts at mid-century. Moreover, during the period that climate change is forecast to increasingly constrain supplies, demands are also generally forecast to increase, further exacerbating the adverse impacts on water supply reliability.

Appendix G: Water Shortage Contingency Plan

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Water Shortage Contingency Plan 2020 Update

Bakersfield District

June 2021

Chapter 1
Introduction

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

☑ ***CWC § 10632.3***

It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

This document describes the water shortage contingency plan (WSCP) for the Bakersfield District (also referred to herein as the "District"). The WSCP includes the stages of response to a water shortage caused by drought or by supply interruptions caused by infrastructure failure, regulatory mandate, or catastrophic human-caused or natural events. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions.

Specifically, this Plan includes the following chapters:

Chapter 1 - Introduction

Chapter 2 - Water Supply Reliability Analysis

Chapter 3 - Annual Water Supply and Demand Assessment Procedures

Chapter 4 - Water Shortage Levels

Chapter 5 - Shortage Response Actions

Chapter 6 - Communication Protocols

Chapter 7 - Compliance and Enforcement

Chapter 8 - Legal Authorities

Chapter 9 - Financial Consequences of WSCP

Chapter 10 - Monitoring and Reporting

Chapter 11 - WSCP Refinement Procedures

Chapter 12 - Plan Adoption, Submittal, and Availability

Chapter 2
Water Supply Reliability Analysis

☑ ***CWC § 10632 (a) (1)*** *The analysis of water supply reliability conducted pursuant to Section 10635.*

As described in Chapter 6 of the District Urban Water Management Plan (UWMP), the District currently purchases water from two sources: (1) untreated Kern River water purchased from the City of Bakersfield (City), and (2) treated Kern River water and imported water purchased from Kern County Water Agency-Improvement District 4 (ID-4). In addition, the District overlies the Kern County Subbasin of the San Joaquin Valley Groundwater Basin (California Department of Water Resources [DWR] Basin No. 5-022.14) and pumps water from that subbasin. The subbasin is not adjudicated; however, in its recent evaluation of California's groundwater basins, DWR determined that it is in a condition of critical overdraft.[1]

Chapter 7 of the District UWMP demonstrates that the supplies available to the District are considered highly reliable in extended drought conditions, and are expected to continue to be sufficient to meet projected District demands in all hydrologic conditions evaluated, including an extended five-year drought period. Although water shortage conditions are not expected to arise due to drought, this WSCP addresses potential water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, catastrophic events, etc.).

Under the Sustainable Groundwater Management Act (SGMA), GSAs have the authority to implement projects and management actions that help basins reach their sustainability goal. As described in Chapter 6 of the District UWMP, the Bakersfield District falls within the jurisdiction of several Groundwater Sustainability Agencies (GSAs), the GSPs of which include various projects and management actions. These projects and management actions do not include any immediately planned groundwater pumping allocations, pumping fees, or other provisions which would be expected to impact the availability of groundwater supply to the District. If such actions are adopted in the future, Cal Water will consider them as a part of its future supply planning efforts.

[1] DWR, 2019. Sustainable Groundwater Management Act 2018 Basin Prioritization, State of California, dated January 2019.

Chapter 3
Annual Water Supply and Demand Assessment Procedures

☑ ***CWC § 10632 (a) (2)***

The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

☑ ***CWC § 10632.1***

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

☑ ***CWC § 10632.2***

An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

On an annual basis, the District will conduct a Supply-Demand Assessment (SDA) to identify whether there is likely to be a water shortage condition in the coming year. This assessment will assume that the following year will experience a shortfall of 20%, corresponding to Water Shortage Level 3. Each element of the annual SDA is described below.

1. Evaluation Criteria

The evaluation criteria that will be used to identify whether the District is likely to experience a water shortage in the coming year include:

a. **Supply Well Operational Constraints -** A comparison of groundwater level elevations to well operational depths to identify the need to (1) lower pump depths, (2) deepen existing wells, or (3) site and drill additional supply wells.

b. **Treatment and Distribution System Constraints -** An assessment of the probabilities of facility and infrastructure outages and the degree to which they could limit Cal Water's ability to access, convey, or treat adequate supplies, including any planned maintenance or capital improvements over the next year that could affect its ability to provide sufficient supply to meet demands.

c. **Local Regulatory Conditions -** Evaluation of (1) any new GSA policies (e.g., pumping allocations) or sustainability criteria that could trigger a change in groundwater volume available for pumping, and (2) any new limitations on well permitting that could limit the ability to deepen existing supply wells or drill new supply wells.

d. **State Regulatory Conditions -** Evaluation of any state-mandated drought or water use restrictions.

These criteria will be assessed by Cal Water staff, including District staff with detailed knowledge of District operations, well conditions, and local GSA activities. The data used to support these assessments may include, but is not limited to, supply capacity, supply and pump capacity, firm capacities, tank storage capacity, groundwater level measurements, system demand, and zone demand.

2. Water Supply

The District obtains its supplies from purchases and from the Kern County Subbasin of the San Joaquin Valley Groundwater Basin (California Department of Water Resources [DWR] Basin No. 5-022.14). As discussed in Chapter 7 of the District UWMP, these supplies are projected to be sufficient to serve future demands. The only identified potential constraints on water supply are the operational limitations and potential local regulatory conditions identified as evaluation criteria above.

3. Unconstrained Customer Demand

The demand forecast described in Chapter 4 of the District UWMP yields the anticipated unconstrained water demand, i.e. the expected water use in the absence of shortage-

caused reductions in water use. During a drought cycle, unconstrained demand typically increases due to higher than normal air temperatures and lower than normal precipitation. The supply reliability analysis and Drought Risk Assessment presented in Chapter 7 of the District UWMP accounts for this anticipated shift in unconstrained water demand, and as discussed above, even with these increases in demand the available groundwater supply is expected to be sufficient to meet these demands.

The model underlying the demand forecast described in Chapter 4 of the District UWMP has an annual time step. Cal Water has begun developing a short-term demand model with a monthly time step that will be more appropriate for the annual supply-demand assessments.

4. Planned Water Use for Current Year Considering Dry Subsequent Year

Cal Water will evaluate the anticipated supplies for the current year, assuming that the following year will be dry, as defined above, using the Evaluation Criteria identified above. Barring changes in supply availability per the Evaluation Criteria, the assumed dry subsequent year is not expected to affect the manner in which Cal Water will draw water from the basin in the current year, and the planned water use for the current year will equal the unconstrained demand.

5. Infrastructure Considerations

As part of its triennial General Rate Case applications to the California Public Utilities Commission (CPUC), Cal Water prepares a Supply-Demand Analysis (CPUC SD Analysis) for each of its Districts. The CPUC SD Analysis is an inventory of water production and pump assets that provide direct and indirect sources of supply to meet customer demands in accordance with CPUC General Order 103-A and California Code of Regulations (CCR) Title 22 Waterworks Standards. This CPUC SD Analysis is based on a combination of regulatory requirements, professional consultant recommendations, and industry standard practices, including those from the American Water Works Association (AWWA) and American Society of Civil Engineers (ASCE). It identifies specific vulnerabilities in different pressure zones within the system and evaluates the system against performance criteria that meet regulatory requirements and ensure operationally adequate levels of service.

Cal Water plans to extend the District CPUC SD Analysis to perform this analysis on an annual basis. This analysis will guide Cal Water's annual evaluation of operational treatment/distribution constraints that could potentially limit the availability of supplies. This evaluation of supply well operational constraints and treatment and distribution constraints will be completed by March 31 of each year and will assess potential impacts on supply availability. If such constraints are identified, Cal Water will

develop a plan to address these constraints, mitigate potential effects, and implement the appropriate water shortage stage of action per Chapter 5, below.

6. Other Factors

   As identified under the Evaluation Criteria above, local regulatory conditions could potentially limit the availability of supplies. Therefore, Cal Water will evaluate the development of new regulatory constraints by March 31 of each year and assess their potential impacts on supply availability. If such constraints are identified, Cal Water will develop a plan to address these constraints and mitigate potential effects and implement the appropriate water shortage stage of action per Chapter 5 below.

Consistent with California Water Code (CWC) § 10632.1, Cal Water will perform and submit an SDA to DWR by July 1st of each year beginning in 2022.

Chapter 4
Water Shortage Levels

☑ ***CWC § 10632 (a) (3)***

(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

Consistent with the requirements of CWC § 10632(a)(3), this WSCP is based on the six water shortage levels (also referred to as "stages") shown in Table 4-1 for the water year ending September 2020. These shortage stages are intended to address shortage caused by any condition, including the catastrophic interruption of water supplies.

Table 4-1. Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Demand reduction (See Table 5-1)
2	Up to 20%	Demand reduction (See Table 5-1)
3	Up to 30%	Demand reduction (See Table 5-1)
4	Up to 40%	Demand reduction (See Table 5-1)
5	Up to 50%	Demand reduction (See Table 5-1)
6	>50%	Demand reduction (See Table 5-1)
NOTES:		

Shortage response actions for each of these stages are identified and discussed in Chapter 5.

Chapter 5
Shortage Response Actions

☑ ***CWC § 10632 (a) (4)***

Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

☑ ***CWC § 10632 (b)***

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

This chapter describes the response actions Cal Water will take to deal with the shortages associated with each of the six stages enumerated in Chapter 4. As discussed above, the existing groundwater supply of the District is expected to be able to serve 100% of future demands under all conditions of precipitation and hydrology. However, inasmuch as Cal Water may have to implement shortage response actions to comply with state mandates, local regulatory changes, or respond to catastrophic events, it is important to carefully identify and describe the anticipated necessary actions.

5.1 Demand Reduction

The combinations of demand-reduction actions required to resolve the shortages associated with each of the six drought stages are based on Cal Water's experiences in dealing with past drought-related shortages and also include other actions deemed appropriate to achieve the required demand reductions. In order to evaluate and ensure that the right actions would be implemented with the proper level of intensity, Cal Water employed the Drought Response Tool (DRT), an Excel spreadsheet model developed by EKI Environment and Water, Inc.

The DRT provides a quantitative framework that allows Cal Water to systematically estimate the monthly and cumulative annual demand reductions expected to result from particular combinations of drought response actions and associated implementation rates. Data inputs to

the DRT include total production, class-specific water use, population, and assumptions regarding the split between indoor and outdoor water use for each customer class.

For each drought response action, the user specifies:

- The customer class(es) and end use(s) that are affected;
- The percent savings for those end use(s) for each account that implements the action. These are based on evaluations reported in the literature, or where such studies are not available, on best estimates based on Cal Water experience; and
- The percentage of accounts assumed to implement the action, which is presumed to be the result of the intensity level of Cal Water program implementation, including but not limited to marketing and enforcement activities.

Based on the foregoing inputs, the DRT model calculates the resulting monthly savings. Cal Water adjusted the combination of actions and implementation levels to achieve the targeted savings levels at each of the six shortage stages.

In order to evaluate the robustness of the DRT model, Cal Water modeled the actions implemented during the height of the last drought for a subset of its Districts, and found that the modeled water shortage reductions were generally consistent with the responses observed in its Districts. In short, the DRT is a robust, transparent tool to tie a particular set of shortage-response actions to an expected reduction in demand.

For each of the six water shortage stages, the modeling targeted the mid-range of the required demand reduction range, ergo:

- 5% for Stage 1,
- 15% for Stage 2,
- 25% for Stage 3,
- 35% for Stage 4,
- 45% for Stage 5, and
- 55% for Stage 6.

The key DRT inputs and outputs for each of the six water shortage stages are reproduced in Attachment A.

Table 5-1 shows the water shortage reduction actions, savings assumptions, and implementation rates that are required for the District to achieve the targeted annual demand reductions for each of the six shortage stages. At each stage, there are two types of demand-reduction actions identified:

- Restrictions on customer water usage; and
- Consumption reduction actions by Cal Water to encourage decreased water usage.

The total demand reductions are governed by is a set of user-specified constraints to ensure that usage levels do not endanger health and safety or result in unacceptable economic impacts. The DRT will not permit estimated usage reductions to violate these constraints,

regardless of the demand reduction actions selected. For most Cal Water districts, including Bakersfield, the following default constraints are used:

- A minimum residential indoor per capita daily usage of 25 gallons,
- A maximum residential outdoor usage reduction of 100%,
- A maximum Commercial, industrial, and institutional (CII) indoor usage reduction of 30%, and
- A maximum CII outdoor usage reduction of 100%.

Many actions are implemented across a number of stages, some at increasing implementation levels. Therefore the actions are listed as a row under the first stage at which they are implemented, and the implementation rate is shown under each stage column heading at the right. The unit savings represent a percentage savings of the end uses indicated in the table.

Because of the DRT logic described above, the format of Table 5-1 differs from that of the default DWR table.

Table 5-1. Demand Reduction Actions to Achieve Required Savings (DWR Table 8-2)

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Stage 1: Minimal Shortage									
Restrictions									
Landscape - Limit landscape irrigation to specific times	Irrigation	**10%**	75%	N/A	N/A	N/A	N/A	N/A	Yes
Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks	**100%**	15%	30%	35%	50%	50%	50%	Yes
Landscape - Restrict or prohibit runoff from landscape irrigation	Irrigation	**3%**	15%	40%	50%	75%	75%	75%	Yes
Landscape - Prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall	Irrigation	**20%**	15%	40%	50%	50%	100%	N/A	Yes
Other - Prohibit use of potable water for washing hard surfaces	Misc. Outdoor	**17%**	15%	40%	50%	75%	75%	75%	Yes
Other - Require shut-off nozzles on hoses for vehicle washing with potable water	Misc. Outdoor	**17%**	50%	50%	50%	75%	75%	75%	
CII - Lodging establishments must offer opt out of linen service	Fixtures & Appliances	**1%**	50%	75%	75%	75%	75%	75%	Yes
CII - Restaurants may only serve water upon request	Fixtures & Appliances	**1%**	75%	75%	75%	75%	75%	75%	Yes

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
No watering of landscape of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission, the Department of Housing and Community Development, or other state agency	Irrigation	**50%**	1.11%	1.11%	1.11%	1.11%	1.11%	N/A	Yes
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	**50%**	50%	75%	75%	75%	75%	75%	Yes
Consumption Reduction									
Expand Public Information/Media Campaign	All	**0.5%**	50%	50%	50%	50%	75%	75%	No
Water Bill Inserts	All	**1%**	100%	100%	100%	100%	100%	100%	No
Promote online water waste reporting	All	**10%**	0%	0%	0%	0%	1%	1%	No
Expand Rebates or Giveaways of Plumbing Fixtures and Devices	All	**10%**	1%	1%	2%	3%	5%	5%	No
Expand Rebates for Landscape Irrigation Efficiency	All	**10%**	1%	1%	2%	3%	5%	5%	No
Expand CII Water Use Surveys	All CII uses	**5%**	1%	1%	1%	2%	2%	4%	No
Expand Res Water Use Surveys	All Residential Uses	**5%**	1%	1%	1%	2%	2%	4%	No
Stage 2: Moderate Shortage									
Restrictions									

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Landscape - Limit landscape irrigation to 1-3 days/week	Irrigation	**15%-79%** [1]		75%	25%	25%	75%	N/A	Yes
Prohibit the use of non-recirculating systems in all new conveyer car wash and commercial laundry systems	Fixtures & Appliances	**50%**		0%	0%	0%	0%	0%	Yes
Prohibit the use of single pass cooling systems in new connections	Cooling	**50%**		0%	0%	0%	20%	20%	Yes
Consumption Reduction									
Water Efficiency Workshops, Public Events	All Residential Uses	**5%**		25%	25%	50%	50%	75%	No
Offer Water Use Surveys	All	**1%**		1%	1%	2%	2%	4%	No
Provide Rebates or Giveaways of Plumbing Fixtures and Devices	All	**10%**		1%	2%	3%	5%	5%	No
Provide Rebates for Landscape Irrigation Efficiency	All	**10%**		1%	2%	3%	5%	5%	No
Stage 3: Severe Shortage									
Restrictions									
Other - Prohibit use of potable water for construction and dust control	Misc. Outdoor	**100%**			1%	1%	1%	1%	Yes
Prohibit use of potable water for street washing	Misc. Outdoor	**100%**			1%	1%	1%	1%	Yes

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Landscape - Prohibit irrigation of ornamental turf on public street medians with potable water	Irrigation	**100%**			20%	20%	25%	N/A	Yes
Prohibit Filling Ornamental Lakes or Ponds	Misc. Outdoor	**100%**			1%	1%	1%	1%	Yes
Consumption Reduction									
Home or Mobile Water Use Reports	All	**5%**			15%	50%	50%	50%	No
Decrease Frequency and Length of Line Flushing	Non Revenue Water	**25%**			50%	50%	50%	50%	No
Reduce System Water Loss	Non Revenue Water	**100%**			10%	10%	10%	20%	No
Increase Water Waste Patrols/Enforcement	All	**10%**			1%	2%	4%	5%	No
Implement Drought Rate Structure and Customer Water Budgets (Res)	All Residential Uses	**30%-60%** [2]			40%	25%	30%	40%	Yes
Implement Drought Rate Structure and Customer Water Budgets (CII)	All CII uses	**10%-30%** [3]			40%	25%	30%	50%	Yes
Stage 4: Critical Shortage									
Water Use Restrictions									
Prohibit vehicle washing except with recirculated water or low-volume systems	Misc. Outdoor	**10%**				50%	50%	50%	Yes
Prohibit use of water for recreational purposes such as water parks and the filling of pools	Misc. Outdoor	**100%**				1%	1%	1%	Yes
Consumption Reduction Actions									
Promote / Expand Use of Recycled Water	Irrigation	**100%**				0%	0%	0%	No

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Stage 5: Emergency Shortage									
Water Use Restrictions									
Require net zero demand Increase on new water service connections	All	**100%**					1.08%	1.08%	Yes
Prohibit single-pass cooling systems	Cooling	**50%**					20%	20%	Yes
Consumption Reduction Actions									
Require Pool Covers	Misc. Outdoor	**28%**					10%	10%	Yes
Stage 6: Extreme Shortage									
Water Use Restrictions									
Moratorium on new water service connections	All	**100%**						1.08%	Yes
Landscape - Prohibit all landscape irrigation	Irrigation	**100%**						50%	Yes
	Cumulative Annual Savings		**8%**	**14%**	**28%**	**37%**	**47%**	**56%**	

NOTES:
1. Watering restricted to no more than 3 days/wk in Stage 2 and Stage 3; no more than 2 days/wk in Stage 4; no more than 1 day/wk in Stage 5.
2. Residential water budgets of up to 30% for Stage 3, up to 40% for Stage 4; 50% for Stage 5, up to 60% for Stage 6.
3. CII water budgets of up to 10% for Stage 3, up to 20% for Stage 4, up to 30% for Stages 5 and 6.

5.2 Supply Augmentation

As indicated in Table 5-2, Cal Water has not identified any supply augmentation actions to assist in resolving future District water shortages. As identified in Chapter 3, Cal Water may consider deepening or drilling new wells if necessary due to declining groundwater levels. However, Cal Water considers these actions to be operational changes (described in Section 5.3), rather than accessing a new supply source.

Table 5-2. Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*
NOTES:			

5.3 Operational Changes

As discussed above in Chapter 3, the primary operational change that Cal Water will consider in the District is extracting groundwater from a lower elevation, utilizing the deeper wells that are drilled following identification of this need as part of the annual SDA. As identified in Table 5-1, the District will also decrease the frequency and length of line flushing under Stage 3 and beyond. The District will also evaluate the potential benefits of altering other maintenance cycles and expediting infrastructure repairs to improve system efficiency, to the extent feasible.

In addition, Cal Water is actively participating in the GSP development process, and will make whatever operational changes are necessary to conform to the results of that process.

5.4 Mandatory Restrictions

The water shortage response actions included in Table 5-1 include a variety of mandatory customer water use restrictions that will be necessary to achieve the targeted demand reductions for the different shortage stages. The types of restrictions and the manner and degree of enforcement for these restrictions vary by stage, and are discussed in Chapter 7.

5.5 Emergency Response Plan

Cal Water has an Emergency Response Plan (ERP) in place that coordinates the overall response to a disaster.

The ERP addresses the Company's responsibilities in emergencies associated with natural disaster, human-caused emergencies, and technological incidents. It provides a framework for coordination of response and recovery efforts within the Company in cooperation with local, State, and Federal agencies, as well as other public and private organizations. The ERP establishes an emergency organization to direct and control operations during a period of emergency by assigning responsibilities to specific personnel.

The ERP does the following:

- It conforms to the State mandated Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS), and it effectively structures emergency response at all levels in compliance with the Incident Command System (ICS).
- It establishes response policies and procedures, while providing the Company clear guidance related to emergency planning.
- It describes and details procedural steps necessary to protect lives and property.
- It outlines coordination requirements.
- It provides a basis for unified training and response exercises to ensure compliance.

The Bakersfield District has installed backup power generators at some of its well sites, booster sites, and pump storage sites that can be operated in the event of a system wide power outage. A complete loss of power has never been experienced, but the generators have been used in the past to overcome localized outages.

The District currently has interties with ID-4.

5.6 Seismic Risk Assessment and Mitigation Plan

☑ ***CWC § 10632.5***

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

Cal Water's ERP includes information on various hazards and a related fault map overlying the District. The Kern County Emergency Operations Plan, which include additional discussion of area earthquake risk and mitigation, can be found at:

https://www.kerncountyfire.org/en/operations/divisions/office-of-emergency-services/emergency-plans/emergency-operations-plan.html.

5.7 Shortage Response Action Effectiveness

Table 5-1 above shows the effectiveness of the specific demand-reduction actions and implementation levels necessary for the District to achieve the targeted savings for each water shortage stage. The bottom row indicates the total annual cumulative savings expected to be reached at each water shortage stage level. Additional details, including anticipated savings on a month-by-month basis are provided in the DRT model inputs and outputs included in Attachment A.

Chapter 6
Communication Protocols

☑ ***CWC § 10632 (a) (5)***

Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Cal Water intends to escalate communication to customers and stakeholders, as needed, throughout any water shortage situation to help ensure they are aware of current conditions, any water use restrictions that are in effect, and the many ways Cal Water can help them reduce their water use. Cal Water's outreach efforts include multiple channels, including bill messages, bill inserts, direct mail, email, letters, social media, print, radio, music streaming services, TV, over-the-top media, movie theatre advertising, and group presentations.

These efforts will expand on current Cal Water outreach efforts and will be customized to the needs at the time of the shortage to ensure a proper channel mix so that the maximum audience is reached as efficiently as possible.

Chapter 7
Compliance and Enforcement

☑ ***CWC § 10632 (a) (6)*** *For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

7.1 Water Use Restrictions

In accordance with Rule 14.1, Cal Water is currently authorized to take the following actions to enforce the water use restrictions:

First Violation: Cal Water shall provide the customer with a written notice of violation.

Second Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation and is authorized to install a flow-restricting device on the customer's service line.

Cal Water has submitted to the California Public Utilities Commission (CPUC) an update to Rule 14.1 and Schedule 14.1, for approval, to align with the restrictions identified in this WSCP. Rule 14.1 and Schedule 14.1 are discussed in more detail in Chapter 8. The current versions of Rule 14.1 and Schedule 14.1 can be found on the Cal Water website.

7.2 Non-Essential, Wasteful Uses

In the event that more stringent measures are needed, implementation of Schedule 14.1 would be requested from the CPUC. If implemented, Cal Water is currently authorized to take the following actions when its personnel verify a customer is using potable water for non-essential, wasteful uses.

First Violation: Cal Water shall provide the customer with a written notice of violation. In addition, Cal Water is authorized to take the following actions:

A. If the customer currently receives service through a metered connection, install a real- time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.

B. If the customer does not currently receive service through a metered connection, install a water meter on the customer's service line, charge the

customer for water use pursuant to Cal Water's metered service tariffs and rules, and install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.

Second Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation. In addition to the actions prescribed under the first violation above, Cal Water is authorized to take the following actions:

A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
   i. If Stage 1 is in effect, $25
   ii. If Stage 2 is in effect, $50
   iii. If Stage 3 is in effect, $100
   iv. If Stage 4 is in effect, $200
B. At its sole discretion, waive the waste of water penalty if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after a notice of violation was delivered, and is in use at the customer's service address.

Third Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the second violation, Cal Water shall provide the first and second violations above, Cal Water is authorized to take the following actions:

A. A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
   i. If Stage 1 is in effect, $50
   ii. If Stage 2 is in effect, $100
   iii. If Stage 3 is in effect, $200
   iv. If Stage 4 is in effect, $400

B. At its sole discretion, waive the waste of water surcharge if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high- efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after notice of violations have been delivered, and is in use at the customer's service address.

Fourth Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the third violation, Cal Water shall provide the customer with a fourth written notice of violation. In addition to actions set forth in previous violations prescribed above, Cal Water is authorized to install a flow- restricting device on the customer's service line.

Egregious Violations: Notwithstanding the foregoing framework for penalties, customers who Cal Water has verified are egregiously using potable water for non-essential, wasteful uses are subject to having a flow- restricting device installed on their service line. After providing the customer with one notice of egregious violation, either by direct mail or door hanger, which documents the egregious use of potable water for non-essential, wasteful uses and explains that failure to correct the violation may result in the installation of a flow-restricting device on the customer's service line, Cal Water is authorized to install a flow-restricting device on the customer's service line.

Cal Water plans to submit to the CPUC an update to Schedule 14.1 to align with this WSCP including, but not limited to, consistency with the new six stage shortage level structure.

7.3 Drought Surcharges

Water budgets and associated drought surcharges are included as actions in Table 5-1. Cal Water will implement such actions through the implementation of Schedule 14.1.

Chapter 8
Legal Authorities

☑ ***CWC § 10632 (a) (7)***

(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

Cal Water is an investor-owned water utility that is regulated by the CPUC. As such, it does not have the authority to adopt resolutions or ordinances. Rule 14.1, as filed with the CPUC, serves as Cal Water's restrictions on non-essential, wasteful uses of potable water. In the event that more stringent measures are required, Cal Water may request the addition of Schedule 14.1 which serves as Cal Water's WSCP and includes staged mandatory reductions and drought surcharges. Cal Water shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency as defined in Section 8558 of the Government Code and to ensure consistency with local resolutions and ordinances.

On April 1, 2016, Cal Water filed its current Schedule 14.1 with the CPUC.[2] The Schedule lays out the staged mandatory reductions and drought surcharges associated with Cal Water's WSCP. This filing is consistent with Resolution W-5034, adopted by the Commission on April 9, 2015, ordering compliance with requirements of the State Water Resources Control Board (SWRCB).

Schedule 14.1 is an extension of Rule 14.1. The compliance and enforcement information presented in Chapter 7 is based on the current versions of both Rule 14.1 and Schedule 14.1, which are based, in part, on the specific SWRCB requirements associated with the Governor's Executive Order B-29-15, which required statewide cutbacks to address the unprecedented 2011-2017 drought, as well as the additional information required pursuant to the CWC.

Cal Water has submitted an update to Rule 14.1 and Schedule 14.1 to the CPUC, for approval, to align with this WSCP.

[2] For reference, the current versions of Rule 14.1 and Schedule 14.1 are included as Attachment B.

In the event of a determination of a water shortage Cal Water shall declare a water shortage emergency in accordance with the Water Code Chapter 3 (commencing with Section 350) of Division 1 and implement the Water Shortage Contingency Plan at the appropriate Stage.

Chapter 9
Financial Consequences of WSCP

☑ ***CWC § 10632 (a) (8)***

A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

In 2008, the CPUC approved the creation of a Water Revenue Adjustment Mechanism (WRAM) and Modified Cost Balancing Accounts (MCBA). The goals of the WRAM and MCBA are to sever the relationship between sales and revenue to remove the disincentive to reduce water use. The WRAM and MCBA are designed to be revenue neutral in order to ensure that both the utility and ratepayers are neither harmed nor benefitted.

In 2020, the CPUC ordered that regulated water utilities may not include the continuation of the WRAM and MCBA in their next general rate case filing but may propose the use of a Monterey-Style Revenue Adjustment Mechanism and Incremental Cost Balancing Account. As such, the WRAM and MCBA will no longer be in place for Cal Water beginning in 2023.

During a water shortage, Cal Water will file for a Drought Memorandum Account, or similar, to track incremental shortage-related expenses to be reviewed by the CPUC for future recovery in rates. Cal Water will also file for a Drought Lost Revenue Memorandum Account, or similar, to track reduced sales to be reviewed by the CPUC for future recovery in rates.

Both the Drought Memorandum Account and Drought Lost Revenue Memorandum Account are mechanisms that have been approved by the CPUC in previous droughts.

Chapter 10
Monitoring and Reporting

☑ ***CWC § 10632 (a) (9)*** *For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

During the period 2014-16, in order to effectively respond to the drought, Cal Water realigned its organizational structure to ensure sufficient resources were available to implement its WSCP. The day-to-day implementation was overseen by the Director of Drought Management & Conservation, with the assistance of the Drought Response Project Manager. The Director of Drought Management & Conservation reported to a team of Cal Water's Officers (Steering Committee), including the President & CEO, the Vice President of Corporate Communications & Community Affairs, the Vice President of Customer Service & Information Technology, the Vice President of Operations, and the Vice President of Continuous Improvement.

Reporting to the Director of Drought Management & Conservation was a team of functional leads, each responsible for managing individual portions of Cal Water's Plan. This team included the Director of Customer Service, the Water Conservation Manager, the Manager of Corporate Communications, the Water Supply Manager, and the Government & Community Relations Manager.

Cal Water would implement a similar structure to effectively manage future water shortages.

This structure includes regular meetings with reporting on items such as:

- Aggregate customer demands,
- Customer compliance with water use restrictions,
- Current and projected water supply conditions,
- Customer outreach activities,
- Customer service inquiries, and
- Operations activities (e.g., water flushing activities, leak repairs, etc.).

Chapter 11
WSCP Refinement Procedures

☑ ***CWC § 10632 (a) (10)*** *Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

Cal Water's Drought Steering Committee utilizes an adaptive management process to regularly assess and determine adjustments and changes to the implementation of the WSCP. These refinements are implemented by the Director of Drought Management & Conservation (or equivalent) through the team of functional leads.

Chapter 12
Plan Adoption, Submittal, and Availability

☑ ***CWC § 10632 (c)*** *The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

The deadline for public comments on the WSCP was June 1, 2021, one week after the public hearing. The final WSCP was formally adopted by Cal Water's Vice President of Customer Service & Chief Citizenship Officer on June 20, 2021. The District UWMP includes a copy of the signed Resolution of Plan Adoption and contains the following:

- Letters sent to and received from various agencies regarding the UWMP and WSCP, and
- Correspondence between Cal Water and participating agencies.

This UWMP and WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline. The submittal was done electronically through Water Use Efficiency Data Portal, an online submittal tool. The adopted WSCP was also sent to the California State Library and to the cities and counties listed in Table 10-1 of the District UWMP.

On or about May 3, 2021, an electronic version of the draft 2020 WSCP was made available for review by visiting Cal Water's website:

https://www.calwater.com/conservation/uwmp-review/.

Attachment A
Key Drought Response Tool Tables and Charts

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bakersfield

Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	5%
Drought Stage	Stage 1
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

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Drought Response Tool

1 - Home

Bakersfield

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE PROFILE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.
6 - DROUGHT RESPONSE TRACKING	Track production and water savings against the conservation target.

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bakersfield

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

2 - Input Baseline Year (2020) Water Use

Bakersfield

Input Baseline Year (2020) Production and Water Use

Units: (mg)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (mg)	Residential Water Use (mg)	COM-GOV Water Use (mg)	Industrial Water Use (mg)	Non-Revenue Water Use (mg)	Total R-GPCD	Comments
October	1,874	995	501	9	369	112	
November	1,497	856	409	8	223	100	
December	1,047	673	330	7	38	76	
January	964	529	254	5	176	60	
February	1,105	536	246	4	319	67	
March	1,222	612	288	6	316	69	
April	1,220	634	289	4	293	74	
May	1,885	785	300	7	793	89	
June	2,432	1,144	477	2	807	134	
July	2,589	1,357	633	6	593	153	
August	2,426	1,366	660	10	390	154	
September	2,135	1,196	549	9	380	140	

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Drought Response Tool

Home | Input Baseline Year Water Use | **Baseline Year Water Use Profile** | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

3 - Baseline Year (2020) Water Use Profile

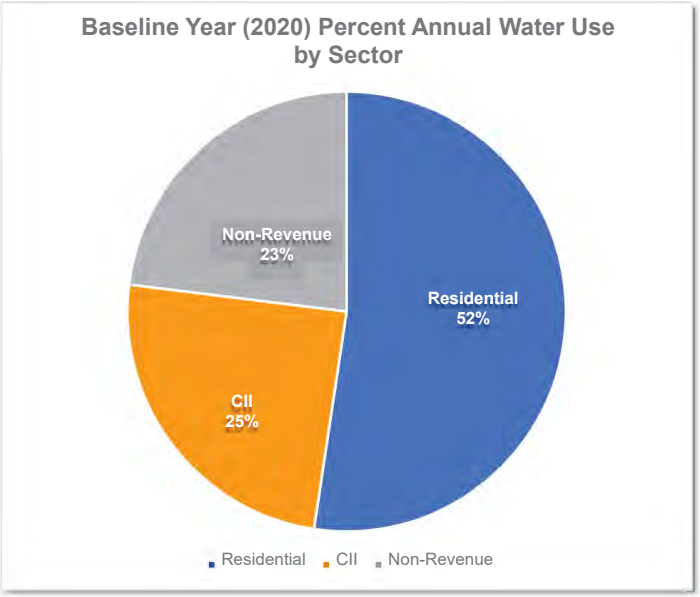
Bakersfield

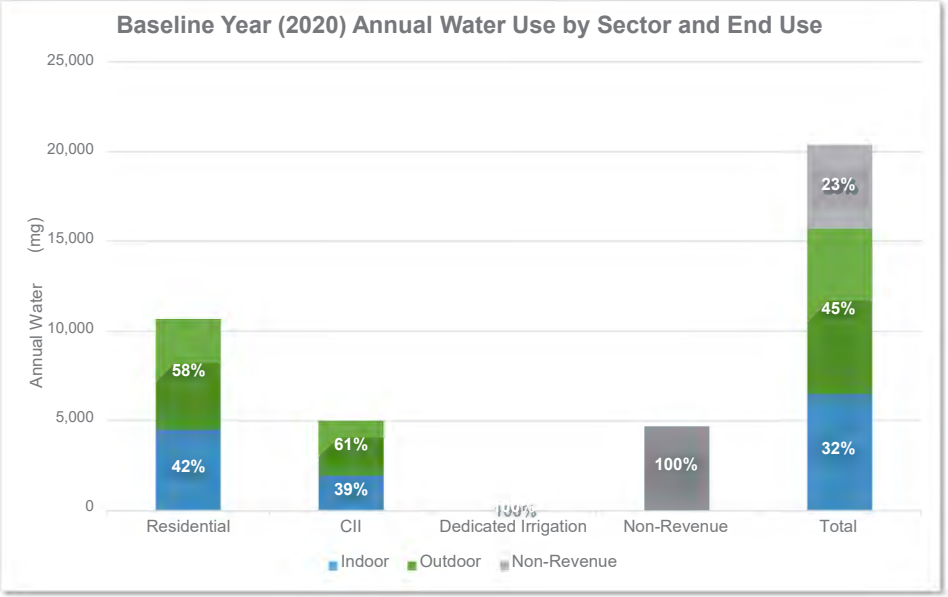
Baseline Year (2020) Annual Water Use Summary

Units: (mg)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

Water Use	Total Production (mg)	Water Use (mg)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	20,395	10,683	5,014	0	4,698	
Total Indoor	6,503	4,532	1,971	--	--	
Total Outdoor	9,194	6,152	3,042	0	--	
Total Non-Revenue	4,698	--	--	--	4,698	
Total Indoor %	32%	42%	39%	0%	--	
Total Outdoor %	45%	58%	61%	100%	--	
Total Non-Revenue %	23%	--	--	--	100%	

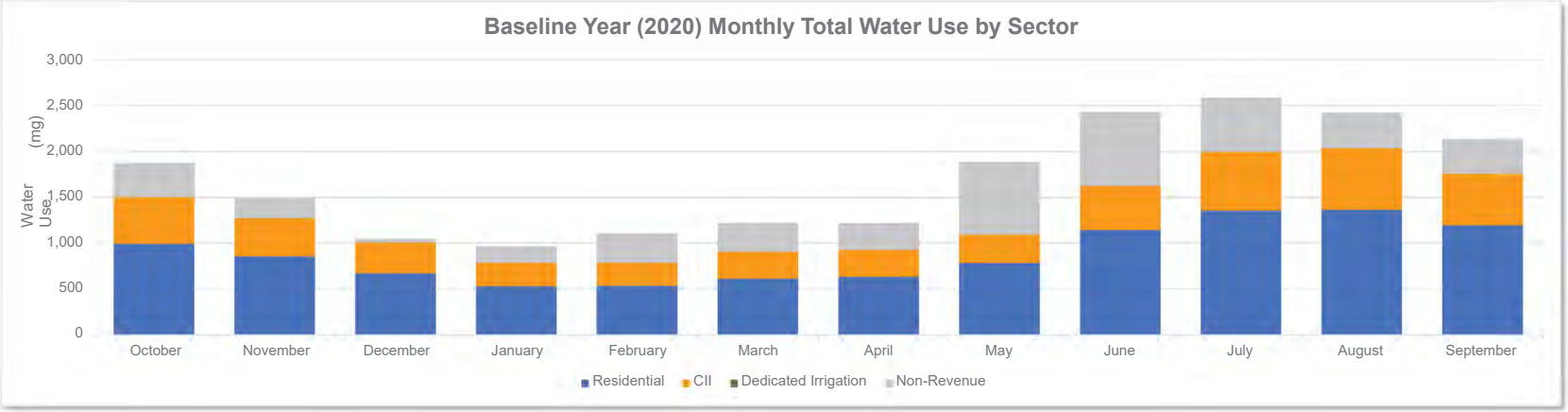


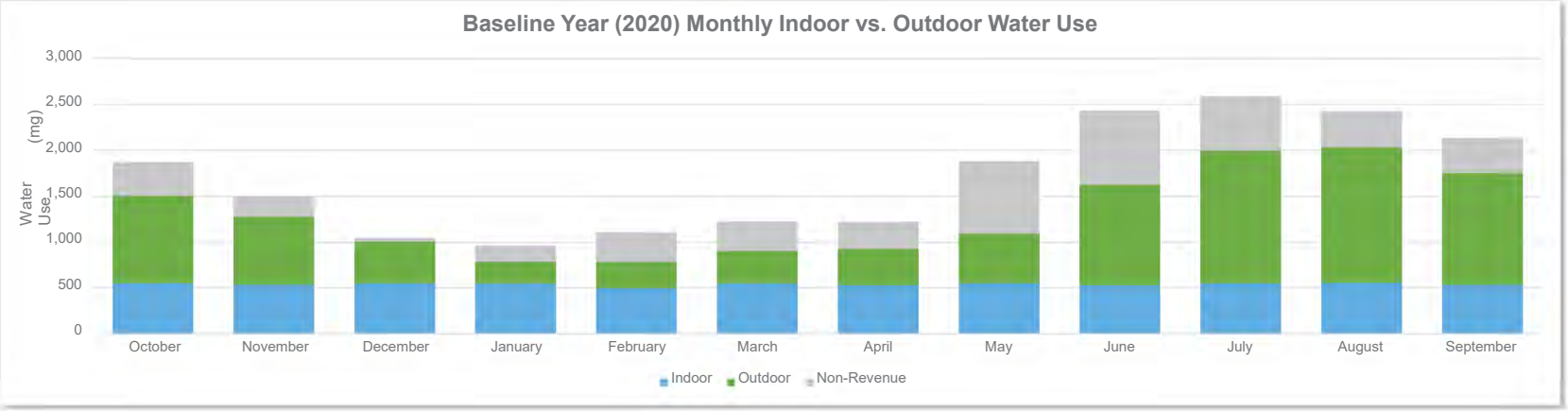


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3 - Baseline Year (2020) Water Use Profile

Bakersfield





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5 - Estimated Water Savings - Stage 1

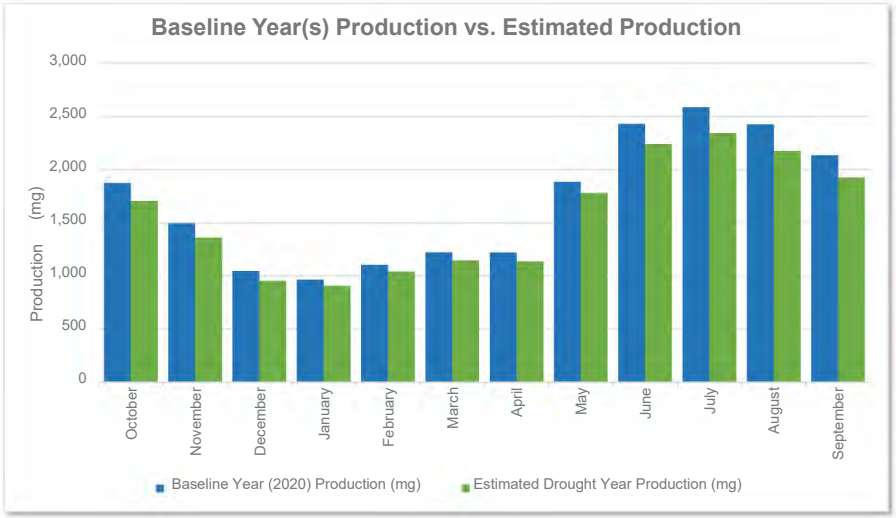
Bakersfield

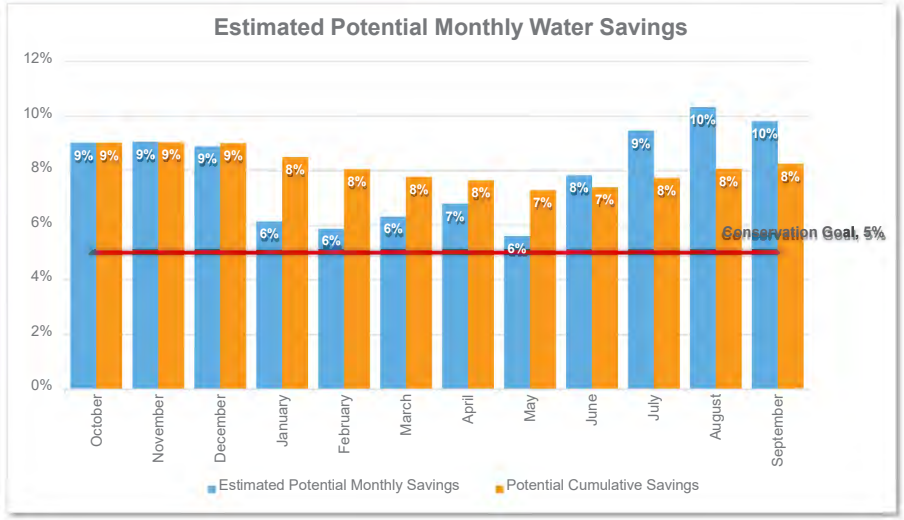
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	1,705	9%	9%	5%	
November	1,497	1,361	9%	9%	5%	
December	1,047	954	9%	9%	5%	
January	964	905	6%	8%	5%	
February	1,105	1,040	6%	8%	5%	
March	1,222	1,145	6%	8%	5%	
April	1,220	1,137	7%	8%	5%	
May	1,885	1,779	6%	7%	5%	
June	2,432	2,241	8%	7%	5%	
July	2,589	2,344	9%	8%	5%	
August	2,426	2,175	10%	8%	5%	
September	2,135	1,925	10%	8%	5%	





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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bakersfield

Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	15%
Drought Stage	Stage 2
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

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5 - Estimated Water Savings - Stage 2

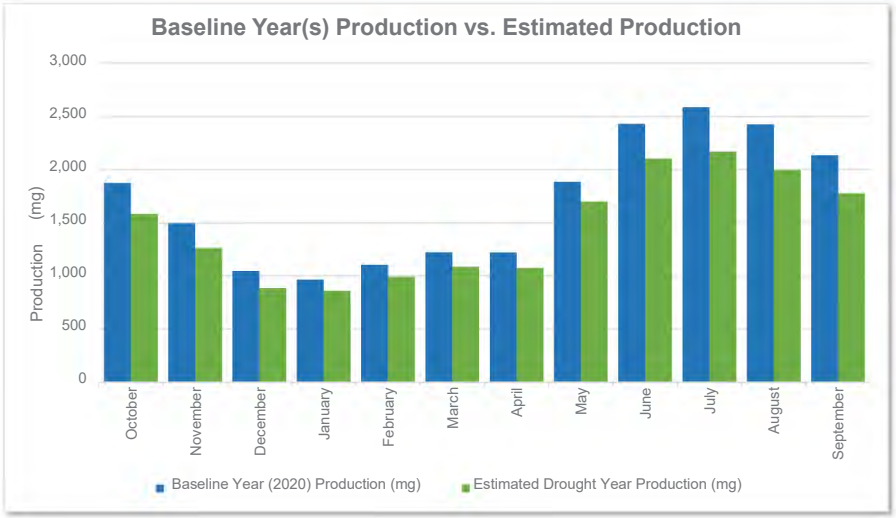
Bakersfield

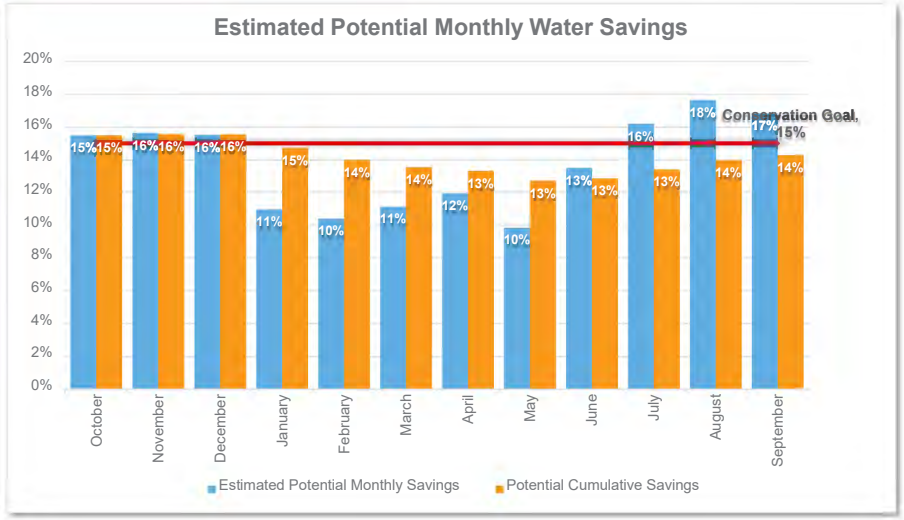
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	1,584	15%	15%	15%	
November	1,497	1,262	16%	16%	15%	
December	1,047	884	16%	16%	15%	
January	964	859	11%	15%	15%	
February	1,105	990	10%	14%	15%	
March	1,222	1,086	11%	14%	15%	
April	1,220	1,075	12%	13%	15%	
May	1,885	1,699	10%	13%	15%	
June	2,432	2,104	13%	13%	15%	
July	2,589	2,170	16%	13%	15%	
August	2,426	1,998	18%	14%	15%	
September	2,135	1,775	17%	14%	15%	





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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bakersfield

Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	25%
Drought Stage	Stage 3
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

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5 - Estimated Water Savings - Stage 3

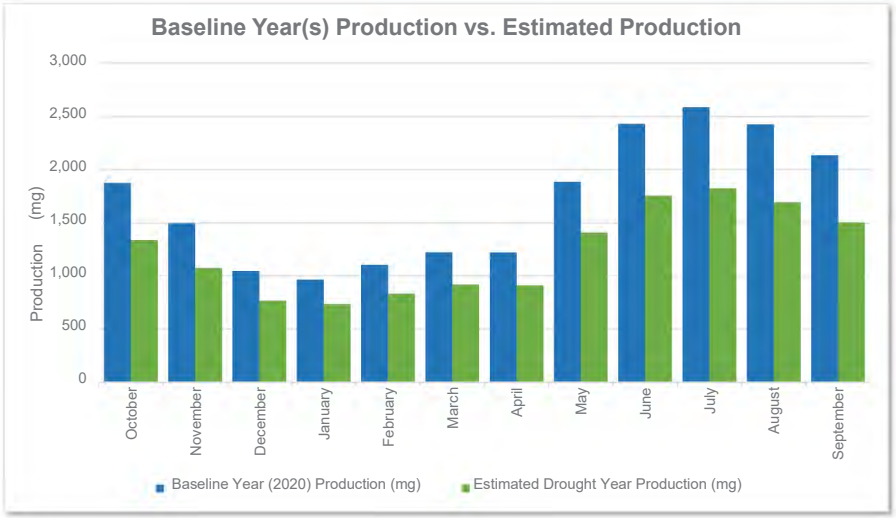
Bakersfield

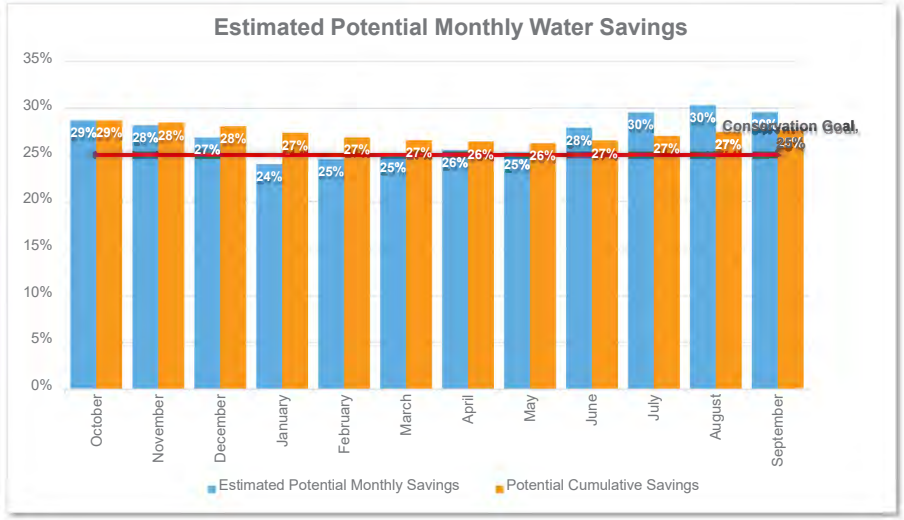
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	1,336	29%	29%	25%	
November	1,497	1,075	28%	28%	25%	
December	1,047	765	27%	28%	25%	
January	964	733	24%	27%	25%	
February	1,105	833	25%	27%	25%	
March	1,222	917	25%	27%	25%	
April	1,220	909	26%	26%	25%	
May	1,885	1,408	25%	26%	25%	
June	2,432	1,753	28%	27%	25%	
July	2,589	1,823	30%	27%	25%	
August	2,426	1,691	30%	27%	25%	
September	2,135	1,503	30%	28%	25%	





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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bakersfield

Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	35%
Drought Stage	Stage 4
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

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5 - Estimated Water Savings - Stage 4

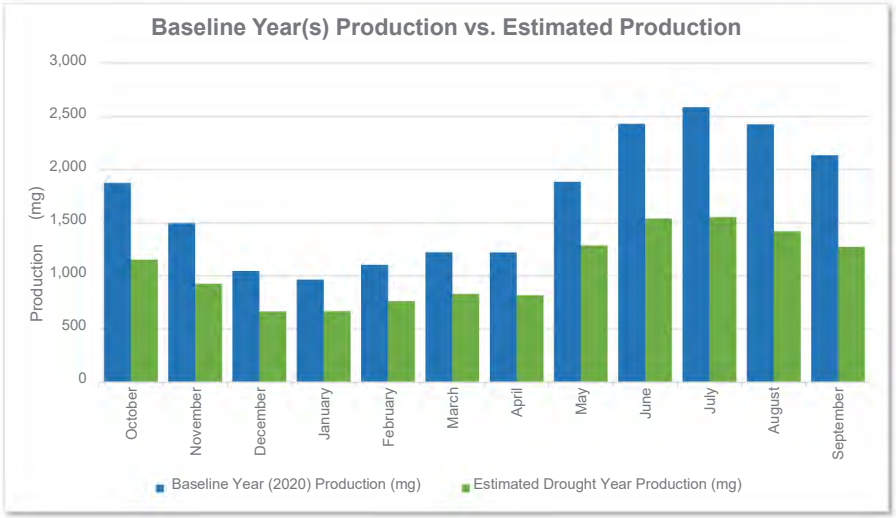
Bakersfield

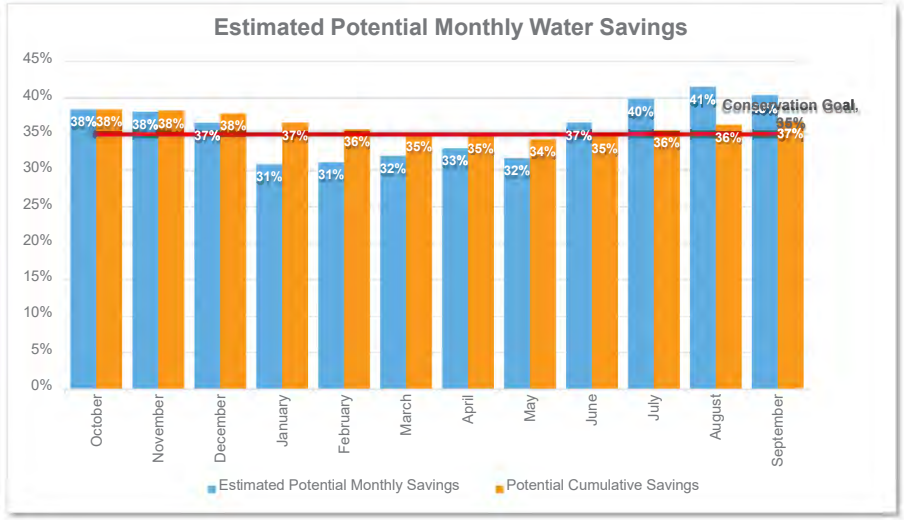
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	1,154	38%	38%	35%	
November	1,497	927	38%	38%	35%	
December	1,047	664	37%	38%	35%	
January	964	667	31%	37%	35%	
February	1,105	761	31%	36%	35%	
March	1,222	831	32%	35%	35%	
April	1,220	817	33%	35%	35%	
May	1,885	1,287	32%	34%	35%	
June	2,432	1,542	37%	35%	35%	
July	2,589	1,557	40%	36%	35%	
August	2,426	1,419	41%	36%	35%	
September	2,135	1,274	40%	37%	35%	





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