Golden State Water Company
A Subsidiary of American States Water Company

# SUPPLEMENT TO THE WATER SUPPLY ASSESSMENT FOR LAKESIDE AT SUTTER POINTE

**OCTOBER 1, 2020**

**PREPARED BY**

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# Abbreviations

| | |
|---|---|
| AF | acre-feet |
| AFY | acre-feet per year |
| ARBCA | American River Basin Cooperating Agencies |
| CDFW | California Department of Fish and Wildlife |
| CEQA | California Environmental Quality Act |
| CFS | cubic feet per second |
| County | County of Sutter |
| CPUC | California Public Utilities Commission |
| CVHM | Central Valley Hydrologic Model |
| CV-RASA | Central Valley Regional Aquifer-System Analysis |
| Delta | Sacramento-San Joaquin Delta |
| Drought | California drought of 2012 through 2016 |
| DWR | California Department of Water Resources |
| ESA | Endangered Species Act |
| GIS | geographic information system |
| GPM | gallons per minute |
| GSA | groundwater sustainability agency |
| GSP | groundwater sustainability plan |
| GSWC | Golden State Water Company |
| IGSM | Integrated Groundwater Surface Water Model |
| LSCE | Luhdorff & Scalmanini Consulting Engineers, Inc. |
| MGD | million gallons per day |
| MWC | mutual water company |
| NARIGSM | North American River Integrated Groundwater Surface Water Model |
| NCMWC | Natomas Central Mutual Water Company |
| NBC | Natomas Basin Conservancy |
| NBHCP | Natomas Basin Habitat Conservation Plan |
| NMFS | National Marine Fisheries Service |
| NRDC | Natural Resources Defense Council |
| PCWA | Placer County Water Agency |
| Project | Lakeside at Sutter Pointe |
| R-GPCD | residential gallons per capita per day |
| RD 1000 | Reclamation District No. 1000 |
| RWA | Regional Water Authority |
| SACIGSM | Sacramento County Integrated Groundwater Surface Water Model |
| SGA | Sacramento Groundwater Authority |
| SGMA | Sustainable Groundwater Management Act of 2014 |
| Subbasin | North American Subbasin of the Sacramento Valley Basin |
| Supplement | Supplement to the Water Supply Assessment for Sutter Pointe, Phase 1 (2020) |
| SWRCB | State Water Resources Control Board |
| USBR | United States Bureau of Reclamation |

| | |
|---|---|
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| UWMP | urban water management plan |
| WSA | Sutter Pointe Specific Plan SB 610 Water Supply Assessment (2008) |

# Section 1 The Sutter Pointe Project

## 1.1 Introduction to the Project

On June 30, 2009, the County of Sutter ("County") issued land use entitlements for a master-planned community known as Sutter Pointe, including:

- Approval of a general plan amendment;
- Approval of a zoning code and map amendments;
- Adoption of the Sutter Pointe Specific Plan;
- Adoption of an urban services plan;
- Adoption of a county facilities master plan;
- Adoption of a public facilities/infrastructure financing plan;
- Adoption of a public facilities/infrastructure phasing plan; and
- Adoption of a development agreement between the County and the Sutter Pointe applicant.

When fully developed, Sutter Pointe will cover 7,528 acres in southeastern Sutter County. The site is defined on the south by the boundary between Sutter and Sacramento Counties, on the west by Powerline Road, on the north by an east-west line approximately 4 miles north of the County boundary, and on the east by Natomas Road. As with most large communities, Sutter Pointe will be developed over a period of years and for planning purposes has been divided into several phases. On March 25, 2019, the developers applied to the County for tentative subdivision map approval for the first phase, known as Lakeside at Sutter Pointe (the "Project") and covering 873.5 acres, approximately 12 percent of the total Sutter Pointe area. The Project is divided into Phases 1, 2 and 3, the locations of which are shown on Figure 1.

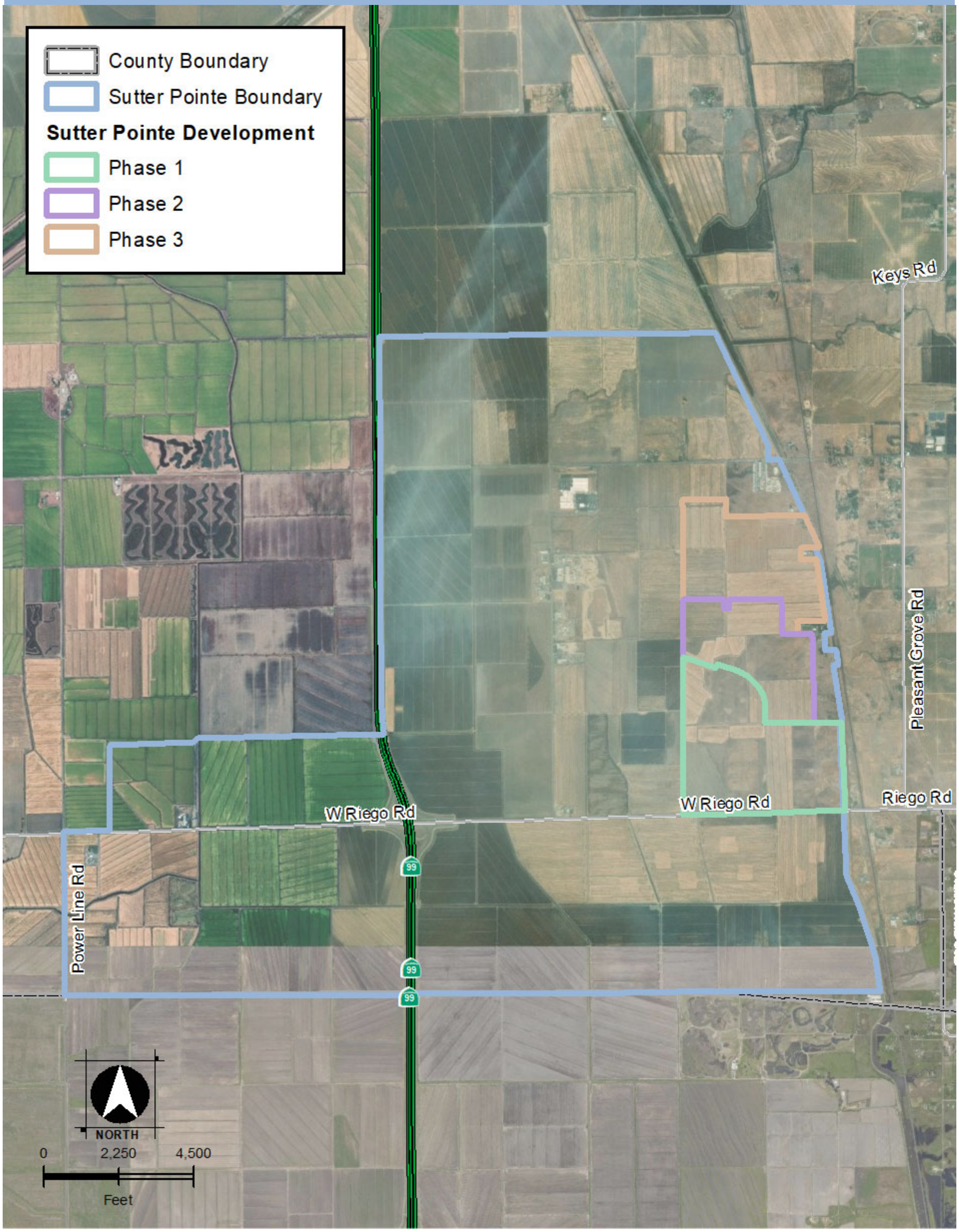
Historically, Sutter Pointe lands have been used for agriculture, specifically the cultivation of rice. Demand for housing and employment centers in the Sacramento region have led to urban development in a northwesterly direction from the downtown core. The Project and Sutter Pointe will continue that trend and contribute both housing and jobs to the County.

This Supplement to the Water Supply Assessment for Lakeside at Sutter Pointe ("Supplement") evaluates the sufficiency of water supplies for the Project. It follows the Sutter Pointe Specific Plan SB 610 Water Supply Assessment ("WSA") prepared for the broader Sutter Pointe development in December 2008 and adopted by the County on June 30, 2009.[1] Together, the WSA and Supplement have been prepared to satisfy the water planning requirements of Senate Bill 610 (2001).

In this Supplement, the term "Sutter Pointe" refers to the entire 7,528 acres of the Sutter Pointe Specific Plan area, while "Project" refers to the 873.5 acres included within Lakeside at Sutter Pointe. Reference is made to subphases of the Project using the terms "Phase 1", "Phase 2" or "Phase 3". Those terms generally refer to the infrastructure, facilities, structures, landscaping and other built features of the various phases of Sutter Pointe development, but may also be used to describe the lands on which such phases will be located, depending on the context.

[1] Tully & Young (2008).

**Figure 1. Location of Sutter Pointe and the Project**



## 1.2 Project Description

The Project site encompasses 873.5 acres on the eastern side of Sutter Pointe. The Project area is bounded by Riego Road to the south, Natomas Road to the east, agricultural land to the north and an irrigation canal to the west.

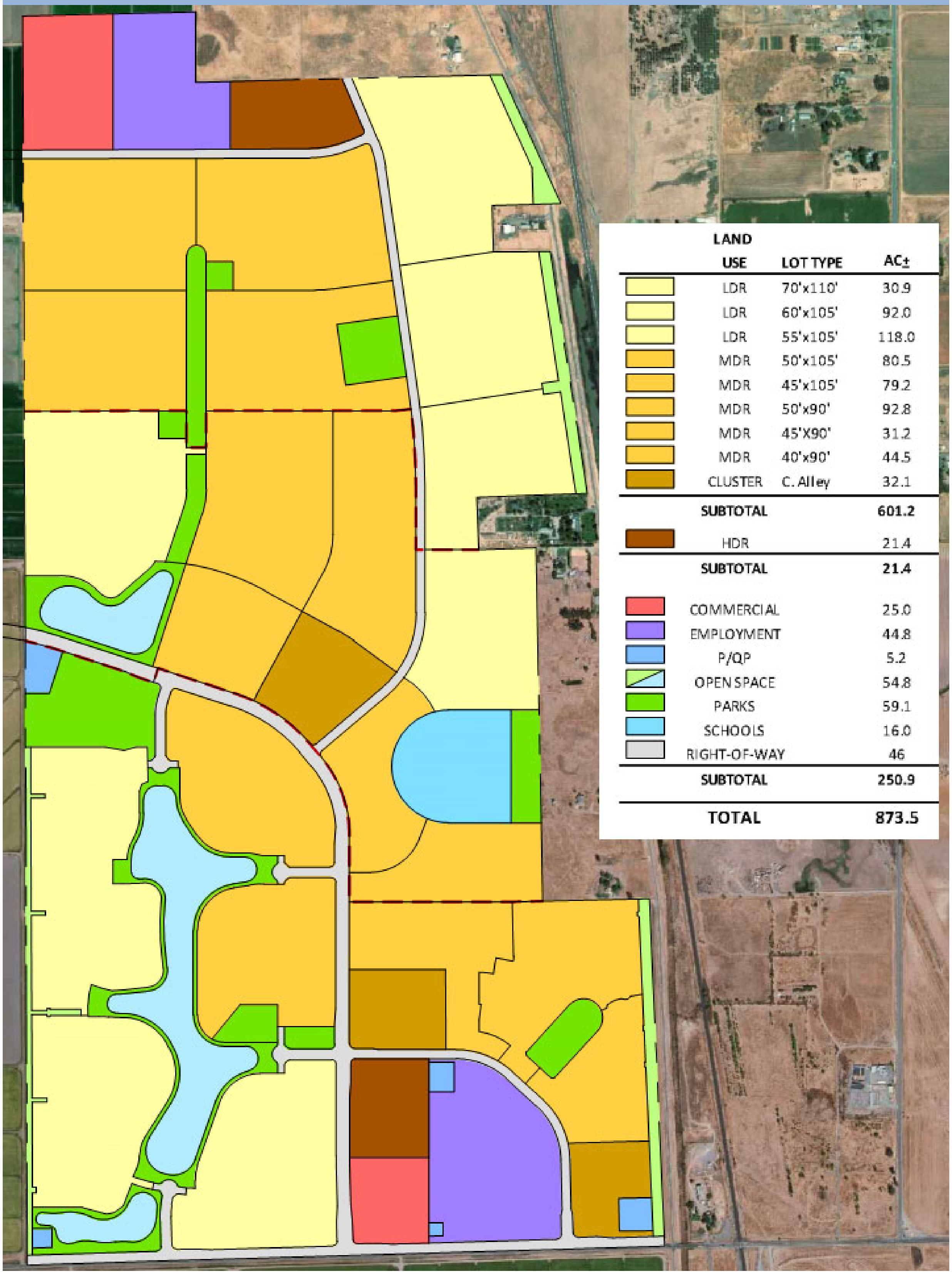
The Project will include a mixture of residential, commercial and public facility land uses. It will contain 3,787 residential units, 69.8 acres of office, commercial and retail development, one K-8 school, parks and open space. Residential development will include 1,105 dwelling units on low density lots, 2,283 dwelling units on medium density lots, and 399 multifamily units. A list of Project land uses is contained in Table 1, and a plan of the proposed development is shown in Figure 2. Approximately 71 percent of Project lands will be used for residential purposes, 8 percent for commercial, and 21 percent for public facilities.

Note that the phasing of Sutter Pointe in this Supplement varies from the hypothetical phasing that was included in the WSA. The WSA divided Sutter Pointe into four residential phases numbered 1 through 4, and four commercial phases lettered A through D. At the time, numbered and lettered phases were expected to be constructed together, with Phases 1 and A together, Phases 2 and B, Phases 3 and C and Phases 4 and D. Phases 1 and A would have covered 2,375.9 acres, while as analyzed in this Supplement, Lakeside at Sutter Pointe will encompass 873.5 acres. This variance in phasing of the development is not expected to impact the overall scope of Sutter Pointe or its water use.

**Table 1. Acreage of land uses in the Project**

| Land Use | | Phase 1 | Phases 2/3 | Total |
|---|---|---|---|---|
| Residential | High density residential | 10.3 | 11.1 | 21.4 |
| | Medium density residential | 123.3 | 237.0 | 360.3 |
| | Low density residential | 106.5 | 134.4 | 240.9 |
| | **Total residential** | **240.1** | **382.5** | **622.6** |
| Commercial | Employment | 26.8 | 18.0 | 44.8 |
| | Commercial retail | 8.9 | 16.1 | 25.0 |
| | **Total commercial** | **35.7** | **34.1** | **69.8** |
| Public facilities | Parks and recreation | 26.7 | 32.4 | 59.1 |
| | Open space – land | 9.2 | 6.4 | 15.6 |
| | Open space – lakes | 31.0 | 8.2 | 39.2 |
| | Schools | 0.0 | 16.0 | 16.0 |
| | Roads | 30.5 | 15.5 | 46.0 |
| | Infrastructure and utilities | 5.2 | 0.0 | 5.2 |
| | **Total public facilities** | **102.6** | **78.5** | **181.1** |
| | **Total** | **378.4** | **495.1** | **873.5** |

**Figure 2. Plan of land uses in the Project**



## 1.3 Water Purveyor

The water purveyor for Sutter Pointe will be Golden State Water Company ("GSWC"), a public utility regulated by the California Public Utilities Commission ("CPUC"). GSWC has owned and operated water systems in California since 1928 and currently owns 38 public water systems across 11 counties, which serve over 260,000 customer connections and 1 million people. In the Sacramento region, GSWC owns and operates two public water systems in Arden and Rancho Cordova, delivering potable water supplies to more than 17,000 service connections. The CPUC granted a certificate of public convenience and necessity for GSWC to provide water service to Sutter Pointe in its Decision 14-06-051 issued July 1, 2014 and Decision 16-09-051 issued October 5, 2016. GSWC's application was supported before the CPUC by the developers of Sutter Pointe and the County.[2]

In addition to the public water system to be owned and operated by GSWC, the development will include construction and operation of one or more wells that will be used to supply water to lakes located within the Project. Much of the water supplies used to fill those lakes will derive from stormwater runoff, but groundwater will be required to keep the lakes full during the summer, when temperatures and evaporation are higher and rainfall is atypical. As set forth in Section 4.2, water demands of the lakes are expected to be approximately 210 AFY. Although GSWC will not be responsible for producing and delivering groundwater for the lakes through its public water system, the relatively minor demands of the lakes are not segregated for purposes of this Supplement, since the source of water is the same for both the lakes and public water system.

As a general matter, financing for construction of the public water system to be used by GSWC to supply water to the Project and Sutter Pointe will be the obligation of the developers, pursuant to an agreement that is currently being negotiated. Such financing will cover all infrastructure needed to supply the groundwater and surface water supplies identified in the WSA and this Supplement for Sutter Pointe, and will be included in the public facilities financing plan prepared as part of the land use entitlement process before the County.

## 1.4 Legal Requirements

SB 610 established the primary legal standards for assessing the sufficiency of water supplies for new development projects.[3] Affected land developments are those that meet certain size thresholds. Those thresholds are met for developments that include more than 500 residential dwelling units, or industrial, manufacturing or processing plants, or an 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.[4] Sutter Pointe and the Project, as described in Section 1.2, would exceed the size threshold for preparation of a water supply assessment.

These statutes require that as part of the environmental review conducted for a qualifying project pursuant to the California Environmental Quality Act ("CEQA"),[5] the relevant public water supplier must prepare a "water supply assessment" of the reliability of water supplies for the project, considering normal, single dry and multiple dry years over a 20-year horizon. If no public water supplier is definitively identified, then the water supply assessment is prepared by the local land use agency. The city, county or other agency considering land use approval must then analyze the environmental impacts of providing water to the project based upon the public water supplier's analysis and any other relevant considerations.

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[2] California Public Utilities Commission (2014, 2016). The CPUC adopted an environmental impact report for its action in approving the CPCN. California Public Utilities Commission (2010a).

[3] Cal. Water Code, §§ 10910-10914.

[4] Cal. Water Code, § 10912(a).

[5] Cal. Pub. Res. Code §§ 21000 *et seq*.

The basic requirement is that a water supply assessment must "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."[6] An assessment must identify existing water supply entitlements, water rights or water service contracts related to the planned water supplies for the project, as demonstrated by written contracts, capital financing plans, federal, state and local permits for construction of infrastructure and regulatory approvals required to be able to convey or deliver the water supplies.[7]

If the water demand for a proposed project is accounted for in an adopted urban water management plan ("UWMP"), the water supply assessment preparer may incorporate the plan information into the assessment.[8] If there is no current UWMP, such as is the case here where the Project is not located within the service area of an existing public water supplier, the water supply assessment must be based on the available evidentiary record.[9]

Upon adoption, the water supply assessment is incorporated into the CEQA document being prepared for the project, and the lead agency must determine, based on the entire record, whether projected water supplies will be sufficient to satisfy demands for the project, in addition to existing and future uses.[10]

There are several general principles for analyzing the sufficiency of water supplies for new development.[11] First, an environmental review document cannot simply ignore or assume a solution to any water supply constraint or limitation. Second, a review document for a large project to be built over a period of years cannot limit its analysis to water supplies needed for the first stage or first few years of the project, but must assume the entire project will be built and analyze the impacts of supplying water to the entire project. Third, future water supplies must bear a likelihood of actually proving available; speculative sources and unrealistic allocations are generally insufficient. An environmental review document must include a reasoned analysis of the circumstances affecting the likelihood of availability for each water supply source. Finally, CEQA requires some analysis of the environmental impacts of possible alternative supplies that may be needed to supplement any uncertainty that may exist. Nonetheless, an analysis of alternative supplies is not necessary if it is clear that future water supplies will likely be available.[12]

For an assessment to be adequate when based on water supplies that are not yet available to the public water system, those future supplies need not be definitely assured through signed, enforceable agreements and already built or approved treatment and delivery infrastructure. Rather, it is expected that land use and water supply planning will occur through roughly contemporaneous processes for those future supplies. An assessment reflects sufficient certainty if it demonstrates a reasonable likelihood that such contracts, financing programs and regulatory approvals will be obtained in the future.[13]

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[6] Cal. Water Code, § 10910(c)(3).
[7] Cal. Water Code, § 10910(d)(2).
[8] Cal. Water Code, § 10910(c)(2); Cal. Water Code §§ 10610 *et seq.* (Urban Water Management Planning Act).
[9] Cal. Water Code § 10910(c)(3), (f)(1).
[10] Cal. Water Code § 10911(b), (c).
[11] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal.4th 412, 430-32 (2007).
[12] *Santa Clarita Organization for Planning the Environment v. County of Los Angeles*, 157 Cal.App.4th 149, 162-63 (2007) (holding that "some legal uncertainty", caused by pendency of litigation related to the proposed water supply, did not trigger the requirement of analyzing alternative supplies under the fourth principle, since the degree of uncertainty was insubstantial).
[13] *Vineyard*, 40 Cal.4th at 432-34.

In order to meet the requirements set forth above, the WSA and this Supplement discuss the water supply demands for the entire Sutter Pointe development, not just the Project. This Supplement focuses on the Project because of timing, but must be understood in the broader context of Sutter Pointe. The water supplies to be used for Sutter Pointe are groundwater produced from the North American Subbasin and surface water diverted from the Sacramento River, both of which have been used on Sutter Pointe lands for over 100 years. Infrastructure, contracts and governmental approvals that will be required to use those groundwater and surface water supplies for the benefit of Sutter Pointe and the Project are discussed in the WSA and this Supplement.

As a matter of law, a water supply assessment is not required for a subsequent project that is part of a project that was the subject of a prior water supply assessment, unless there are substantial changes in the project, the ability of the public water system to provide sufficient water supplies to the project has changed, or significant new information becomes available since the time the original assessment was prepared.[14] Since the WSA was adopted, Sutter Pointe has not changed in a manner that would cause an increase in water demands, and the conclusion regarding the sufficiency of water supplies for Sutter Pointe is the same in both the WSA and this Supplement. This Supplement has been prepared in order to address new information that was not available when the WSA was written in 2008, including, *inter alia*, the passage of, and management of groundwater pursuant to, the Sustainable Groundwater Management Act of 2014[15] and the terms of the Water Wholesale Agreement between GSWC and Natomas Central Mutual Water Company in 2011.[16] Otherwise, the original WSA remains valid and applicable to the water demands and supplies of Sutter Pointe.

[14] Cal. Water Code § 10910(h).
[15] See Section 5.4.
[16] See Section 6.4.

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# Section 2 History of the Sutter Pointe Lands

## 2.1 Overview of the Natomas Basin

Sutter Pointe is located within an area commonly known as the Natomas Basin, as shown in Figure 3. The area has been used for intensive agriculture for over 100 years, with urban development slowly encroaching from the south. This Section 2 describes the historical development of land and water within the Natomas Basin, with a focus on those lands that will be part of Sutter Pointe. This context is important because the waters that have been used to irrigate Sutter Pointe lands for the past 100 years are the same waters that will be used for urban development in future.

## 2.2 Agricultural Development of the Natomas Basin

Agricultural development of the Sacramento Valley began in 1843 with the planting of wheat by John Sutter. Growing of wheat and barley by dry-farming continued to be the principal agricultural activity in the region for a number of years, and irrigation did not begin until the early 1900s. As of 1912, only 3.5 percent of agricultural lands in the Sacramento Valley were under irrigation, but that figure had expanded to 14.3 percent by 1919.[17] In Sutter County, the number of irrigated acres increased from 1,173 in 1909 to 42,305 in 1919, partly based on development of the Natomas Basin.[18]

Prior to 1911, lands in the Natomas Basin were used for small farms that grew mostly wheat, alfalfa or annual vegetable crops. The Sacramento River flooded the area on a regular basis, depositing rich and fertile soils, but also making extensive use of the lands difficult, since whole crops could be lost to periodic flooding.[19] The Natomas Basin was one of a series of flood basins located upstream of tributaries to the Sacramento River. It was formed when inflows from the Bear and Feather Rivers were blocked from entering the main stem of the Sacramento, and when flows of the Sacramento were retarded by inflows from the American River. Some water remained in the southern portion of the Natomas Basin year-round and was known as Bush Lake.[20]

Increasing interest in intensive agriculture, coupled with the occurrence of large floods in 1907 and 1909, led the California and United States governments to adopt the Sacramento Flood Control Project devised by the U.S. Army Corps of Engineers' California Debris Commission in 1911.[21] As stated by that commission, "the great amount of reclaimable land in the Sacramento Valley, its high value after being reclaimed, and the great damage to the land already reclaimed, wrought every few years by floods, render the problem of flood control a vital one which must be solved in the immediate future."[22] The Sacramento Flood Control Project established the system of levees and bypasses that control floods in the Sacramento Valley today, including the Sutter and Yolo Bypasses and levees surrounding the Natomas Basin.[23]

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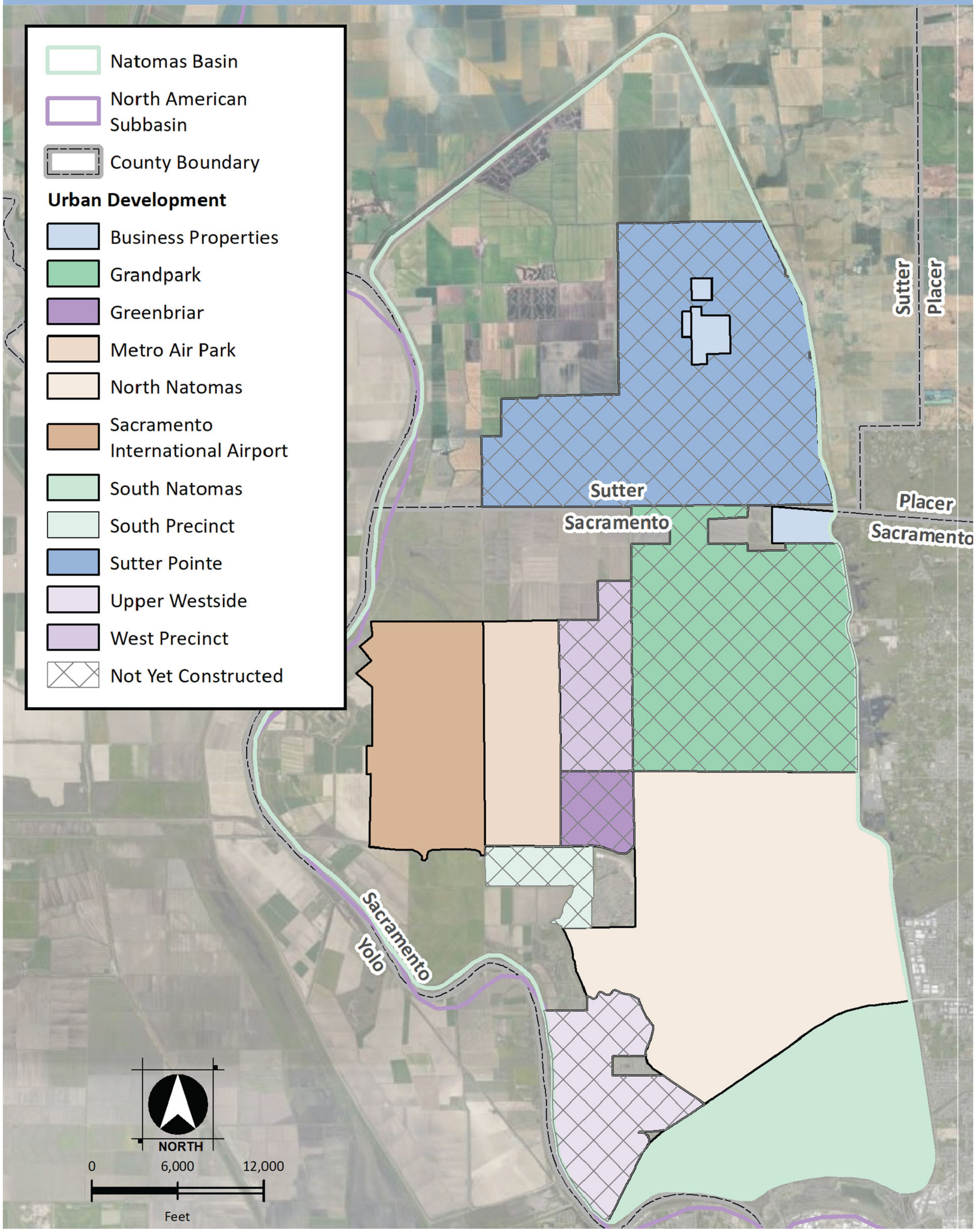
[17] Bryan (1916), pp. 2-4; Bryan (1923), p. 4.
[18] Bryan (1923), p. 5.
[19] Bryan (1916), p. 5; Natomas Consolidated of California (1912b, 1912d).
[20] Bryan (1923), pp. 39, 42, 172, Plate IV; Forbes (1931); Olmstead & Davis (1961), p. 25.
[21] Kelley (1989), pp. 275-277; Wilson (2011), p. 8. For the United States and California adoption of the Sacramento Flood Control Project, see Public Law 64-367, 64th Congress, 2nd Sess., Chap. 144, § 2, 39 Stat. 948-951 (1917) (United States); Stats.1911, 39th Leg., Extra Sess., Chap. 25, §§ 1-4 (1911) (California). *See also* Cal. Water Code § 12645(a).
[22] California Debris Commission (1911), pp. 4-5.
[23] *See* Kiesel (1915). Mr. Kiesel was an officer in the Natomas Company and a landowner in the Natomas Basin.

**Figure 3. Development of the Natomas Basin**



Natomas Basin lands were developed for large-scale agricultural use starting in the 1910s, led by the Natomas Company,[24] a successor to the Natomas Water & Mining Company that had operated since the gold rush in the vicinity of Folsom and Rancho Cordova.[25] Following its historical mining activities, Natomas Company owned approximately 30,000 acres of dredged lands east of Sacramento along the American River, which it called the "Natomas irrigated lands". Seeing agricultural land development as a new part of its business, the company also acquired approximately 60,000 acres north of Sacramento along the eastern banks of the Sacramento River, which it called the "Natomas reclamation lands". The Natomas Company reclamation lands within the Natomas Basin are shown as the shaded areas on the map in Figure 4.[26]

In 1911, Natomas Company worked with political leaders in Sacramento and Sutter Counties and the California Legislature to form Reclamation District No. 1000 ("RD 1000"), which was tasked with development of levees and other infrastructure for protection of the Natomas Basin.[27] Natomas Company had acquired approximately 85 percent of the lands within RD 1000 and thus a controlling interest in the area.[28] Between 1911 and 1915, RD 1000 constructed approximately 41 miles of levees surrounding the perimeter of the basin to keep floodwaters out, and more than 100 miles of drainage ditches and pumps to discharge water from the basin to the Sacramento River.[29] At the time, Natomas Company claimed that its reclamation project was the largest by a private company in the United States.[30]

The original plan of Natomas Company was to sell its lands in small lots of 40 to 50 acres, with each lot holding a family residence and agricultural lands.[31] The lands were divided into nine subdivisions, known as the Bennett, Central, Counsman, East Side, Elkhorn and Goodland Subdivisions and Riverside Subdivisions Nos. 1 through 3, as depicted on Figure 4. Natomas Company also intended to provide ongoing services to landowners, including construction of an experimental farm, instruction in agricultural practices, and marketing of crops.[32] Consultants to the company estimated that its 60,000 acres of reclamation lands could be sold in about 10 years, at a rate of 5,000 to 10,000 acres per year.[33]

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[24] During the development period, the Natomas Company assets were owned by several related entities. Natomas Consolidated of California was incorporated in 1907 and reorganized in 1914 into Natomas Company of California. That entity held the land assets until 1928, when it was reorganized again into the Natomas Company. That corporation was acquired by Diamond Shamrock in 1984 and thereafter ceased its independent existence. For purposes of continuity and ease of discussion, this Supplement refers to all of these entities as "Natomas Company". An interesting historical sidenote is that the 1914 reorganization was planned and executed by Herbert Hoover, later President of the United States. Castaneda, Docken, Pitti & Ide (1984), pp. 264-65.

[25] The principals of Natomas Company were a group of San Francisco and Sacramento businessmen, with financing obtained from San Francisco and London. Natomas Company had its main offices in the Alaska Commerical Building, which stood at 350 Californa Street in San Francisco from 1908 to 1975. *See* Castaneda, Docken, Pitti & Ide (1984), pp. 260-62; Sutter County Historical Society (1997a, 1997b, 1997c).

[26] Natomas Consolidated of California (1912a).

[27] Act 930, Stats.1911, Ch. 412, p. 835 (1911). *See generally* Hendricks & Prince (2006); *San Francisco Call* (1911); Wilson (2011), p. 8. Natomas Company also arranged for the formation of Reclamation District No. 1001, which covers 43,395 acres north of RD 1000.

[28] Natomas Company of California (1915). *See* Castaneda, Docken, Pitti & Ide (1984), p. 245.

[29] Natomas Company of California (1916). Use of the drainage system is discussed in further detail in Section 6.2.2.

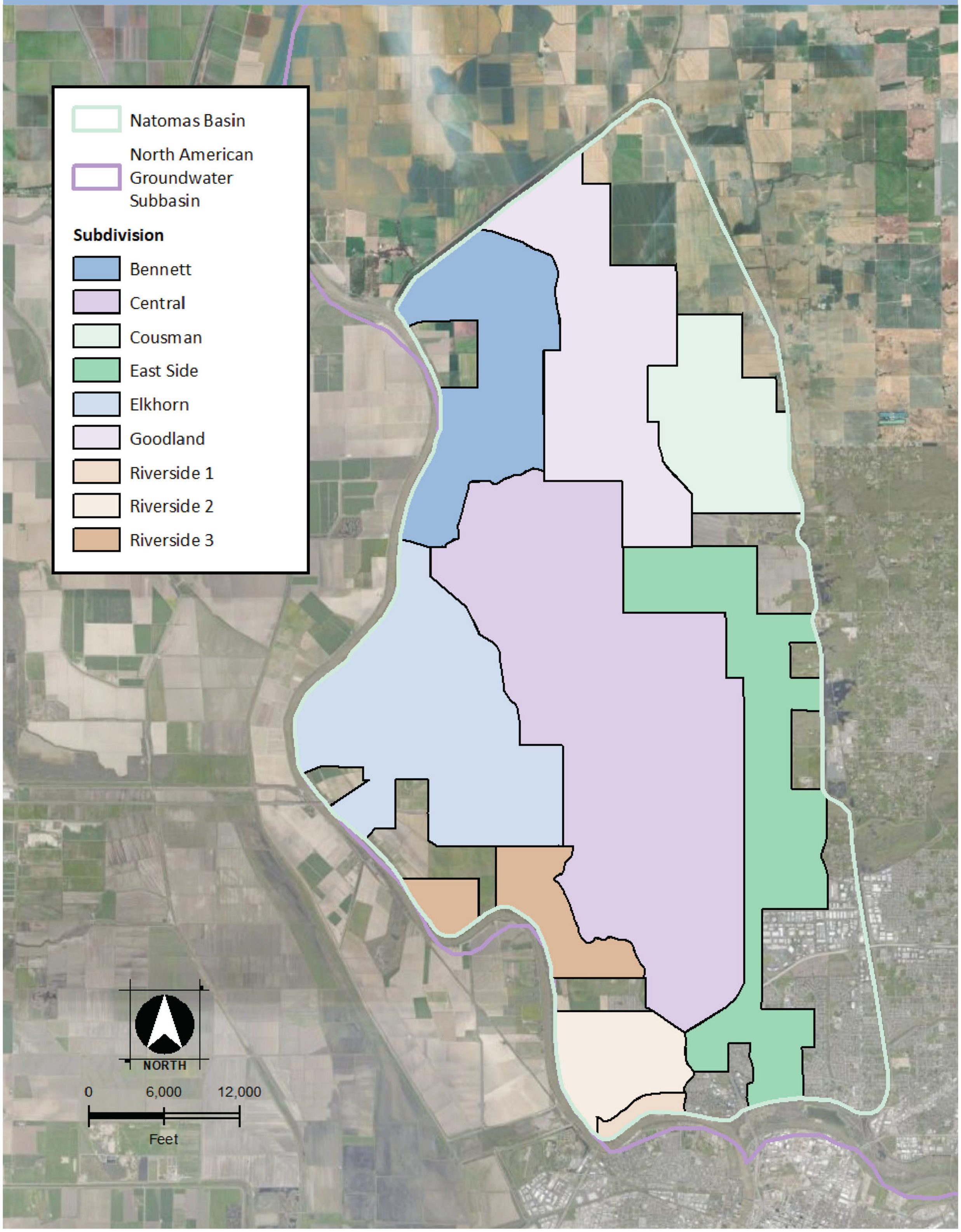
[30] Natomas Consolidated of California (1912f); *San Francisco Examiner* (1913). For a description of the Natomas Company reclamation lands and other private projects, see Kelley (1989), pp. 298-99, and Wilson (2011), p. 17. For the history of an even larger private reclamation project in the Great Dismal Swamp of coastal North Carolina and Virginia during the late 1700s, covering approximately 575,000 acres, see Royster (1999).

[31] Adams (1912), p. 77; *Sunset* (1912).

[32] Natomas Consolidated of California (1912c, 1913a, 1913b).

[33] White (1907), pp. 44-47. *See* Wilson (2011), p. 26.

Figure 4. Natomas Company lands in the Natomas Basin



Following completion of the levee system in 1915, Natomas Company began selling the reclaimed lands for agricultural use, and by 1916 the California Reclamation Board reported that the "sea of flood waters [in the Natomas Basin] was replaced by a sea of waving grain."[34] Expansion of agriculture in the Natomas Basin and the broader Sacramento Valley was assisted by completion in 1914 of the Panama Canal, which allowed crops to be transported down the Sacramento River and to global markets in a timely and economical manner.[35]

Unfortunately for Natomas Company, the sale of lands was slow during the agricultural depression of the 1920s and 1930s, and what sales did occur were often cancelled because of the purchasers' default.[36] Sales proceeded very slowly for many years and did not significantly accelerate until following World War II, when Natomas Company finally decided to discount the price of lands to below book value. Lands then sold rapidly, with the company disposing of its last acreage in 1950.[37] Due to market conditions, the original, utopian vision of Natomas Company never came to pass,[38] and the lands were eventually purchased and held in larger landholdings. Few residences were ever built in the area other than along Garden Highway, which runs immediately along the Sacramento River on the west side of the Natomas Basin.

**Table 2. Crops grown within Natomas mutual water companies by acreage, 1929**

| Crop | Elkhorn | Natomas Central | Natomas Riverside |
|---|---:|---:|---:|
| Alfalfa | 1,537 | 1,046 | 844 |
| Beans | 812 | 272 | 205 |
| Deciduous trees | 302 | 69 | 83 |
| Rice | 0 | 656 | 0 |
| Truck vegetables | 81 | 607 | 18 |
| **Total** | **2,732** | **2,650** | **1,150** |

Source: California Department of Public Works, Division of Water Resources (1930), Table 26, p. 89. For discussion of the Natomas mutual water companies, see Section 2.3.

During the sales period, Natomas Company leased retained lands to growers, so that lands were often under irrigation and cultivation for a significant period before being sold. In 1915, Natomas Company reported leasing 35,000 acres of the reclamation lands; in 1916, the company reported the lease of 52,000 acres and planting of crops on 47,500 acres.[39] By 1950, the Natomas Basin lands were fully used for agricultural purposes. Crops grown in the Natomas Basin included alfalfa, barley, beans, corn, hay, melons, orchards, potatoes, pumpkins, truck vegetables and wheat, and landowners also raised cattle, sheep and hogs.[40] A snapshot of crops planted

[34] California Reclamation Board (1916), pp. 17-18.

[35] Castaneda, Docken, Pitti & Ide (1984), p. 237; Kelley (1989), p. 302; Natomas Consolidated of California (1912e).

[36] *See*, *e.g.*, Natomas Company of California (1921), p. 3 ("During the year the demand for farming lands fell off considerably and comparatively few sales are at present being made"); Natomas Company of California (1923), p. 2 ("During the year 1922, a large number of sales contracts had to be cancelled owing to the failure of purchaser to meet payments either for interest or principal, or to cultivate the lands under their sales contracts").

[37] Castaneda, Docken, Pitti & Ide (1984), pp. 11, 230, 281.

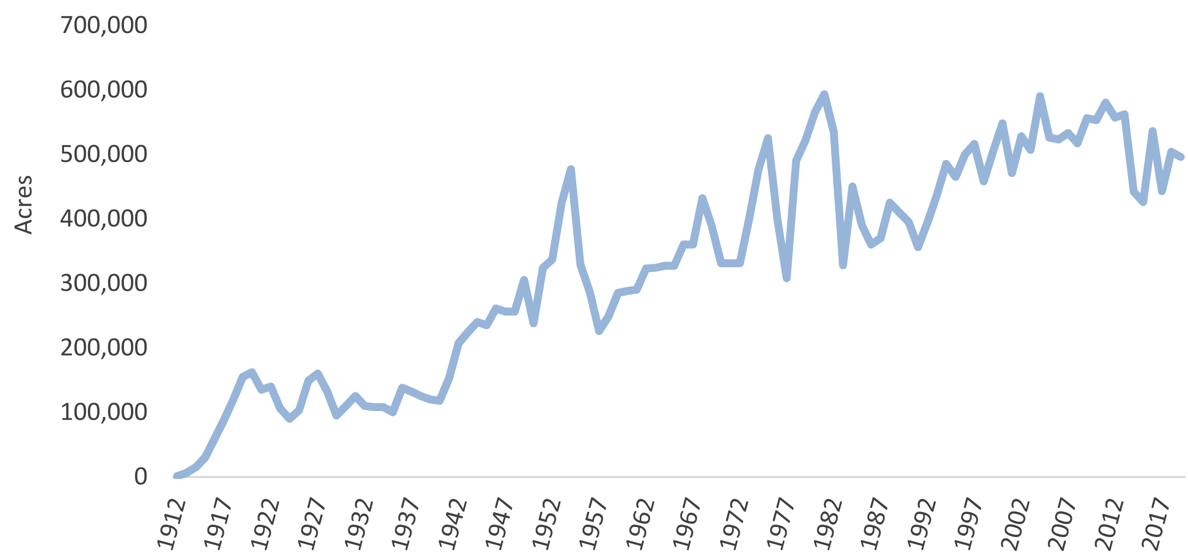
[38] For example, see statement in Natomas Consolidated of California (1913c), pp. 18-19: "The position of the tiller of the soil in the present enlightened period is much to be desired… The farmers, therefore, are the founders of human civilization." For a critique of such agricultural boosterism in the Sacramento region, including that offered by Natomas Company, see Kelley (1989), pp. 302-06, and Sandul (2013), pp. 12-13.

[39] Natomas Company of California (1915, 1916). *See* Castaneda, Docken, Pitti & Ide (1984), pp. 273-75.

[40] Natomas Consolidated of California (1912b, 1912d).

in 1929 is captured in Table 2. As early as 1914, some Natomas Basin lands were planted in rice,[41] and that acreage steadily increased so that it accounted for more than half of the 25,000 acres irrigated in 1949.[42] Most of the Natomas Basin has been planted in rice for several decades now, including the Sutter Pointe lands.[43] The growth in lands used to cultivate rice in California is shown in Figure 5, and lands within the Natomas Basin generally followed that trend.

**Figure 5. Rice harvested in California, 1912-2019**




Source: United States Department of Agriculture, National Agricultural Statistics Service (2020).

## 2.3 Organization of Irrigation Water Deliveries

In addition to the reclamation of lands within the Natomas Basin, Natomas Company developed a series of plans for securing irrigation water supplies. Prior to the efforts of that company, lands in the area were generally dry farmed for wheat without irrigation.

In 1912, Natomas Company signed a contract to purchase irrigation water from Oro Electric Corporation, which was planning to construct a reservoir and hydroelectric generating facilities near Oroville, California on the Feather River. That contract would have provided Natomas Company up to 10,000 inches of water, which is a flow equivalent to 250 CFS, or approximately 160 MGD.[44] However, Oro Electric Corporation failed as the result of a decision by the California Railroad Commission related to its electric service area, and the planned reservoir was never constructed.[45]

[41] Castaneda, Docken, Pitti & Ide (1984), p. 274. *See* Natomas Company of California (1919), p. 5 (reporting irrigation of 1,300 acres of rice).
[42] Olmstead & Davis (1961), p. 206.
[43] Most rice grown on Sutter Pointe lands historically has been white rice, with a smaller quantity of wild rice. Since water demands of the two types are similar, this Supplement does not attempt to distinguish between them further.
[44] Natomas Consolidated of California (1912g). For comparison, a constant rate of 160 MGD during the period from April 1 through September 30 would yield approximately 90,000 AF.
[45] California Railroad Commission (1912); Oro Electric Corporation v. Railroad Commission of California, 169 Cal. 466 (1915) (affirming decision of CRC); Fowler (1923), pp. 124-125. The assets of Oro Electric Corporation were acquired by Pacific Gas & Electric Co. in 1916. California Railroad Commission (1917); Fowler (1923), p. 125.

After the failure of Oro Electric Corporation, Natomas Company applied to the newly formed State Water Commission for the right to appropriate water from the Sacramento River for use in the Natomas Basin. Between 1916 and 1919, Natomas Company filed four applications with the State Water Commission, which was a predecessor agency to the State Water Resources Control Board ("SWRCB"):

- Application 534 for the Elkhorn Subdivision, with a place of use of 6,600 acres;
- Application 1056 for Riverside Subdivisions No. 1 through 3, with a place of use of 3,523 acres;
- Application 1203 for the Central Subdivision, with a place of use of 14,510 acres; and
- Application 1413 for the Bennett and Goodland Subdivisions, with a place of use of 10,140 acres.[46]

Beginning in 1915, Natomas Company constructed pumps to divert water from the Sacramento River and irrigation canals to deliver water to lands within its subdivisions. The first systems constructed were the Elkhorn Water System (completed in 1917), Riverside Water System (completed in 1918) and Central Water System (completed in 1921).[47] As of 1921, the company decided not to build additional irrigation facilities until lands were sold and ready for planting, as a means of saving money, which meant that the Bennett and Northern Water Systems were constructed more slowly.[48] In 1926, management reported that the irrigation systems were able to deliver water to all lands owned by the company that could practicably be irrigated from the Sacramento River without pumping in the distribution system.[49] By 1927, the combined irrigation systems could deliver water to 33,470 acres.[50]

Ultimately, Natomas Company organized four mutual water companies to assume responsibility for delivery of water within the Natomas Basin. Beginning in 1911, California began to regulate the economic affairs of private water companies through the California Railroad Commission, and Natomas Company realized that any plan to deliver water itself would subject it to the jurisdiction of the commission, which would have been a negative outcome. Therefore, Natomas Company created the mutual water companies to divert surface water from the Sacramento River for distribution to lands owned by it and others, since mutual water companies were outside the jurisdiction of the commission.[51]

The four new companies were Elkhorn Mutual Water Company ("MWC"), Natomas Riverside MWC, Natomas Central MWC ("NCMWC") and Natomas Northern MWC. Natomas Company planned for each mutual water company to acquire and operate its own point of diversion from the Sacramento River and distribution canals, while RD 1000 would construct and operate drainage canals for the entire Natomas Basin. Basic information regarding the four companies as of 1929 is found in Table 3. The original service areas of the four companies, as well as the current service area of NCMWC, are shown in Figure 6.

The first corporation to be organized was Elkhorn MWC in 1918. It was formed to acquire and operate the Elkhorn Water System for the benefit of the Elkhorn Subdivision in Sacramento County. The service area covered approximately 6,000 acres, and the corporation was authorized to issue 6,000 shares to landowners, with each share corresponding to a right to receive irrigation water for one acre of land. Along with the Elkhorn Water System, Natomas Company assigned water right Permit 247 (Application 534) to Elkhorn MWC effective July 1, 1926. That water right authorized the diversion of up to 42.18 CFS from the Sacramento River at the Elkhorn Pumping Plant located at River Mile 73.3.

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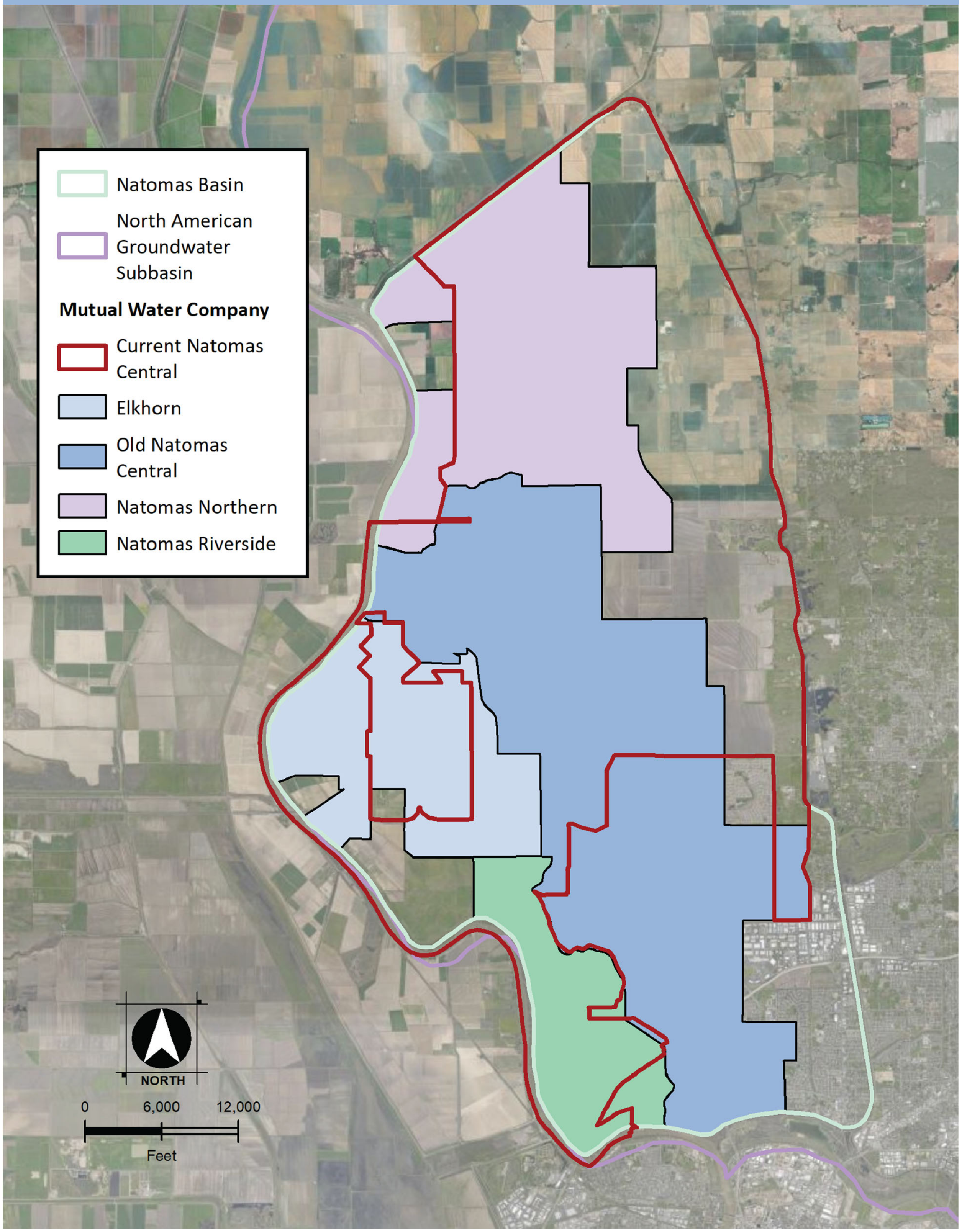
[46] The water rights associated with these applications are discussed further in Section 6.2.3.
[47] Natomas Company of California (1918), p. 3.
[48] Natomas Company of California (1922), p. 3 ("Extensions to these systems are being made only as land sales are made").
[49] Natomas Company of California (1926), p. 3.
[50] Natomas Company of California (1928), p. 3.
[51] The same legal system is in place today, and mutual water companies are exempt from the jurisdiction of the CPUC, the successor agency to the CRC.

**Figure 6. Service areas of Natomas mutual water companies**



| Table 3. Acreage of Natomas mutual water companies, 1929 | | |
|---|---|---|
| **Company** | **Gross Acreage** | **Irrigated Acreage** |
| Elkhorn Mutual Water Company | 6,000 | 2,670 |
| Natomas Central Mutual Water Company | 19,341 | 3,100 |
| Natomas Northern Mutual Water Company | 9,591 | Unknown |
| Natomas Riverside Mutual Water Company | 3,550 | 1,590 |

Source: California Department of Public Works, Division of Water Resources (1930), Table 25, p. 87.

Natomas Riverside MWC was incorporated on January 10, 1920, with the stated purpose to "purchase, lease or otherwise acquire from Natomas Company of California the so-called Riverside Water System in the County of Sacramento, State of California, now belonging to the said last named corporation, together with the water appropriations and water rights appurtenant thereto, and to operate, manage and control the said system, water appropriations and water rights for the purpose of supplying water from the said system at cost among the shareholders of this corporation for the irrigation of the lands of the stockholders of this corporation."[52] The service area of the company included all of Riverside Subdivisions Nos. 1 and 2, a portion of Riverside Subdivision No. 3, and several nearby parcels, which together made up 3,550 acres. The corporation was authorized to issue 3,600 shares, with subscribers to be issued one share per acre of land owned within the service area. Effective July 1, 1926, Natomas Company assigned water right Permit 511 (Application 1056) to Natomas Riverside MWC, which allowed the company to divert up to 44.04 CFS from the Sacramento River at the Riverside Pumping Plant located at River Mile 65.4.

NCMWC was incorporated on July 1, 1921 to acquire and operate the Central Water System in Sacramento and Sutter Counties. The original service area included portions of the Central, Elkhorn and East Side Subdivisions and made up 19,341 acres. The corporation was authorized to issue 19,400 shares to landowners within the service area. Natomas Company assigned water right Permit 580 (Application 1203) to NCMWC effective July 1, 1926, allowing the diversion of up to 160 CFS of water from the Sacramento River at the Prichard Pumping Plant located at River Mile 75.3.[53]

Natomas Northern MWC was formed on March 6, 1926 to acquire and operate the Bennett and Northern Water Systems in Sacramento and Sutter Counties. The service area included the Bennett and Goodland Subdivisions, with a combined 9,591 acres. The articles of incorporation authorized the issuance of 9,600 shares to landowners within the service area.[54] Natomas Company assigned water right Permit 1129 (Application 1413) to Natomas Northern MWC on July 1, 1926, which allowed the diversion of up to 120 CFS from the Natomas Cross Canal at the Bennett Pumping Plant, located approximately 1.2 miles upstream of its confluence with the Sacramento River, and the Northern Pumping Plant, located approximately 2.5 miles upstream from the confluence.

The mutual water companies found their operations to be more effective when coordinated, and eventually NCMWC assimilated the three other companies and expanded across the Natomas Basin. The only relict of multiple companies is the five nominally separate distribution systems owned by NCMWC, known as the Bennett, Central, Elkhorn, Northern and Riverside systems. The transactions that resulted in current operations by NCMWC are described below.

[52] Natomas Riverside Mutual Water Company (1920), Art. Second.
[53] Natomas Central Mutual Water Company (1921).
[54] Natomas Northern Mutual Water Company (1926), Arts. Second, Sixth.

- Natomas Company wound up the business and dissolved Natomas Northern MWC effective July 9, 1938.[55] Subsequently, the NCMWC articles of incorporation were amended to expand its service area to include portions of the area previously covered by Natomas Northern MWC, resulting in a service area of 24,697 acres, with 24,800 shares authorized.[56] Natomas Company confirmed to the SWRCB that it had transferred all its right, title and interest in Permit 1129 (Application 1413), which had previously been assigned to Natomas Northern MWC, to NCMWC.[57] Thus, although there was no formal merger of Natomas Northern MWC and NCMWC, the latter ultimately acquired the assets and service area of the former.

- Elkhorn MWC merged into NCMWC effective September 8, 1961. After the merger, NCMWC had a service area of 30,650 acres, with authority to issue 30,800 shares.[58]

- Natomas Riverside MWC merged into NCMWC effective October 1, 1963. After the merger, NCMWC delivered water to 34,200 acres and had authority to issue 34,400 shares.[59]

- NCMWC expanded water deliveries to additional portions of the Natomas Basin on October 13, 1964, resulting in a service area of 40,997 acres and 43,000 authorized shares.[60]

- Effective June 30, 1967, NCMWC amended its service area to include all lands within RD 1000. The company stated that the portion of those lands that could feasibly be served with water was approximately 50,000 acres, and the maximum number of shares was set at 50,000.[61] As described in Section 2.4, by 1967 urban development had started to encroach into the Natomas Basin.

Figure 6 shows the current corporate boundaries of NCMWC. The company owns and operates three points of diversion on the Sacramento River, two points of diversion on the Natomas Cross Canal, 130 miles of lateral canals and 35 pump stations. During the irrigation season, the company also uses 180 miles of drainage ditches and 16 pump stations owned by RD 1000 for the reuse of irrigation tailwater. NCMWC has the physical ability to deliver irrigation water to approximately 33,900 acres.[62] The company currently has 31,015 issued and outstanding shares, each of which is appurtenant to one acre of land within the corporate boundaries.[63] Within any given year, some of those acres may be fallow based on agricultural crop rotation practices, but a large majority of the shareholder lands will be planted and irrigated. More information about the current operations of NCMWC is contained in Section 6.2.

## 2.4 Urban Development of the Natomas Basin

While lands within the Natomas Basin were originally developed for agricultural use, some areas have transitioned to urban uses as the Sacramento metropolitan region has grown. In addition, other lands are the subject of current urban development plans. The current extent of urban development in the Natomas Basin is depicted in Figure 3, as well as proposed future developments in both Sacramento and Sutter Counties.

55 Natomas Northern Mutual Water Company (1938).
56 NCMWC (1942).
57 Natomas Company (1942).
58 NCMWC and Elkhorn Mutual Water Company (1961); NCMWC (1961).
59 NCMWC and Natomas Riverside Mutual Water Company (1963); NCMWC (1963); Natomas Riverside Mutual Water Company (1963).
60 NCMWC (1964).
61 NCMWC (1967).
62 Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 11-12.
63 Personal communication with Brett Gray, General Manager of NCMWC (June 5, 2020).

### 2.4.1 South Natomas

The first area to be developed for urban use was South Natomas, with the conversion of lands generally occurring from 1950 through 1980.[64] As South Natomas urbanized, the lands were annexed into the City of Sacramento,[65] and the city began providing municipal water service in lieu of irrigation water deliveries previously made by Natomas Riverside MWC. The loss of service area by that company was a factor in its merger into NCMWC in 1963. When it assimilated lands within the Natomas Basin into its water service area, the City of Sacramento provided water supplies from its own portfolio, which are a combination of surface water from the Sacramento and American Rivers and groundwater from the North American and South American Subbasins.[66]

### 2.4.2 Sacramento International Airport

The Sacramento International Airport is located in the west-central Natomas Basin, with the west runway constructed in 1967, the east runway in 1987, the original (now demolished) terminal in 1967, Terminal A in 1998 and Terminal B in 2011. Other structures include a private air terminal, rental car facility and maintenance shops. Water is used at the airport for sanitation, food preparation, cleaning and maintenance tasks, and landscape irrigation. The Sacramento International Airport is located within the service area of NCMWC and receives water from the company for landscape irrigation. The airport produces groundwater from its own wells to meet all potable water demands.

### 2.4.3 Business Properties

The Natomas Basin also includes a few isolated business properties: Holt of California at 7310 Pacific Avenue, Pleasant Grove, started in the 1970s; Sysco Sacramento at 7062 Pacific Avenue, Pleasant Grove, started 2000; Teichert Aggregates at 7466 Pacific Avenue, Pleasant Grove; Maxim Crane Works at 7512 Pacific Avenue, Pleasant Grove; and Sterling Caviar farm at 9149 East Levee Road, Elverta, California, started 1988. Sterling Caviar is located just to the south of Sutter Pointe on the eastern edge of Natomas Basin, while the other business properties are located within the Sutter Pointe lands along Pacific Avenue, to the east of State Highway 99. None are located within the Project site. Each of those business properties owns and operates its own water system, which are supplied with groundwater to meet all demands. They are expected to continue in operation after the development of Sutter Pointe. They may continue to own and operate separate water systems or may connect to the water utility system to be owned and operated by GSWC. In either case, their existing water usage is part of historical baseline conditions for groundwater utilization in the Natomas Basin.

### 2.4.4 North Natomas

The North Natomas area was developed in the 1990s, following the opening of Sleep Train Arena (formerly known as ARCO Arena) in 1988.[67] The arena served as home of the Sacramento Kings professional basketball team from 1988 to 2016, and residential and commercial development grew up around the site. The arena itself has been largely unused since 2016, and the owners are currently determining future uses of the land. One proposal would see the site redeveloped for 2,000 residential units and 1.18 million square feet of commercial space.[68] Like South Natomas, North Natomas was annexed into the City of Sacramento as development occurred, and the city assumed responsibility for municipal water supplies in the area.

[64] City of Sacramento (2015b), p. 3-SN-4.
[65] City of Sacramento (2013); Wilson (2011), p. 77.
[66] City of Sacramento (2016), p. 3-4.
[67] City of Sacramento (2015a), pp. 3-NN-10 to -11.
[68] Sacramento CBS 13 (2018).

### 2.4.5 Metro Air Park

Metro Air Park is a 1,320-acre industrial park located immediately to the east of Sacramento International Airport. The first portion of the development was constructed in 2017 and houses an 855,000 square-foot Amazon fulfillment center. The remainder of the park is currently being marketed by the developer. Metro Air Park was not annexed into the City of Sacramento, but is located on unincorporated lands within the County of Sacramento. Municipal water services are provided by Sacramento County Water Agency, Zone 50, which purchases water on a wholesale basis from the City of Sacramento. The city has not located any groundwater wells within Metro Air Park and does not have any plans to do so in future.

### 2.4.6 Greenbriar

Greenbriar is an approved, but not yet constructed, master-planned community with residential, commercial, park and open space land uses located at the northwestern corner of the intersection of Interstate 5 and State Route 99 in Sacramento County. If completed, the project would cover 577 acres and is planned to include 2,922 residential units on 253.9 acres, 28.6 acres of retail and commercial development, 10 acres for a school site, 32.5 acres of parks and 57.9 acres of open space. The project would also include the 28.3-acre Lone Tree Canal Reserve and three off-site habitat reserve areas covering 528.5 acres. Development is expected to occur in two phases of roughly 36 months each.[69] The project was approved by the Sacramento City Council in January 2008, and the area was annexed to the city in June 2008. The city will provide water supplies to Greenbriar through its existing municipal water system, with pipelines extended onto the project site. The city does not plan to locate any groundwater wells within the Greenbriar boundaries.[70]

### 2.4.7 Grandpark

The proposed Grandpark Specific Plan would be located in unincorporated Sacramento County and would cover approximately 5,675 acres north of Elkhorn Boulevard and south of the Sacramento-Sutter County line. The project was previously known as Natomas North Precinct Specific Plan. Proposed land uses include 21,915 residential units on 2,740 acres, 1,600 commercial units on 375 acres, and 2,066 acres of parks and open space. Water utility services for the development have not yet been determined, but may be provided by Sacramento County Water Agency or GSWC. Water sources may include groundwater underlying the property, surface water purchased from NCMWC, or wholesale supplies purchased from the City of Sacramento or Sacramento Suburban Water District.[71]

### 2.4.8 Upper Westside

The proposed Upper Westside Specific Plan is located on approximately 2,000 acres north of Interstate 80 and west of Interstate 5. A land use entitlement application was submitted to Sacramento County on February 26, 2019 and included approximately 10,000 residential units and 5 million square feet of commercial development. The area is composed of unincorporated lands in Sacramento County. Water utility services and supplies for this proposed development have not yet been determined.

[69] City of Sacramento (2017), p. 2-3.
[70] City of Sacramento (2017), pp. 3-41, Discussion Note b, 3-64.
[71] County of Sacramento, Office of Planning and Environmental Review (2017).

### 2.4.9 Other Areas of Sacramento County

The County of Sacramento and City of Sacramento worked together to prepare a Natomas Joint Vision plan between 2001 and 2015. Two areas identified for potential future development were the West and South Precincts, as shown on Figure 3. Potential developers or landowners have not yet applied for urban land use entitlements for those areas. Outside of the West and South Precincts and areas described in other subsections of this Section 2.4, the Sacramento County portion of the Natomas basin is anticipated to remain under current land uses, serving as agricultural, conservation or airport management areas. No water utility service or supply plans have been made for the West and South Precincts, and the timing of their development is unknown.[72]

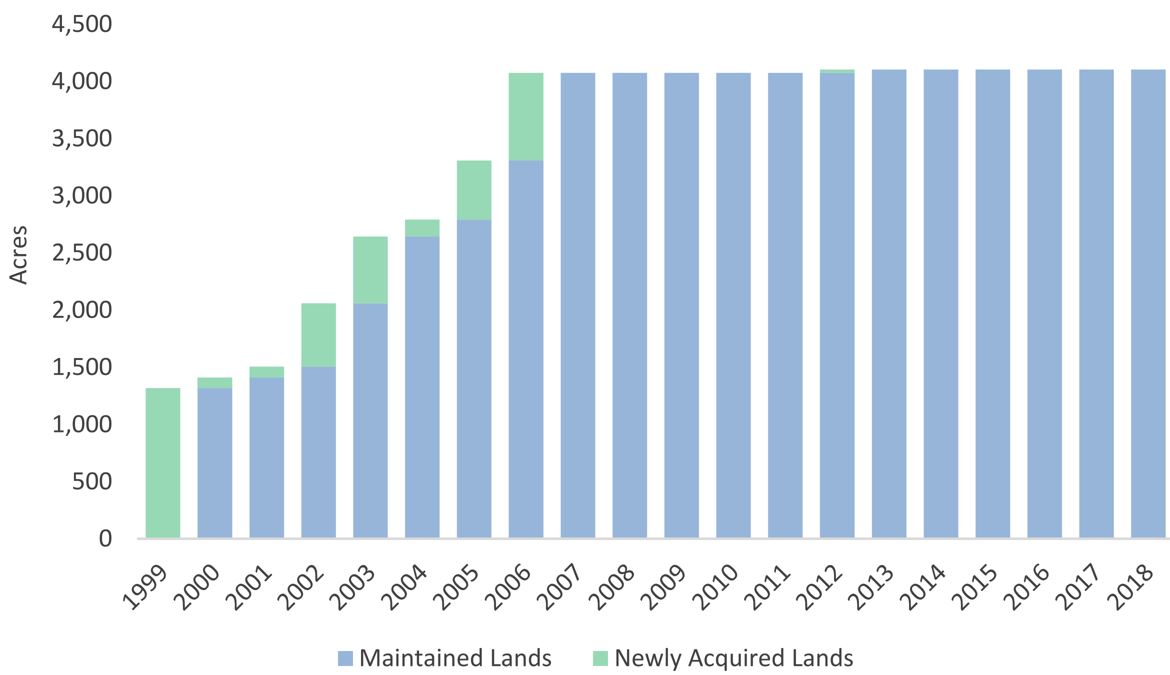
### 2.4.10 Sutter County Areas

Sutter Pointe is located in the Sutter County portion of the Natomas Basin and is the subject of this Supplement. Other areas of Sutter County are expected to remain under current land uses, i.e., agriculture or conservation.

## 2.5 The Natomas Basin Conservancy

In anticipation of urban development within the Natomas Basin, the City of Sacramento and County of Sutter entered into the Natomas Basin Habitat Conservation Plan ("NBHCP") with the California Department of Fish and Game and U.S. Fish and Wildlife Service. The NBHCP was approved in 1997, and the Natomas Basin Conservancy ("NBC") was formed in 1998 to manage the acquisition and maintenance of mitigation lands within the basin pursuant to the plan.

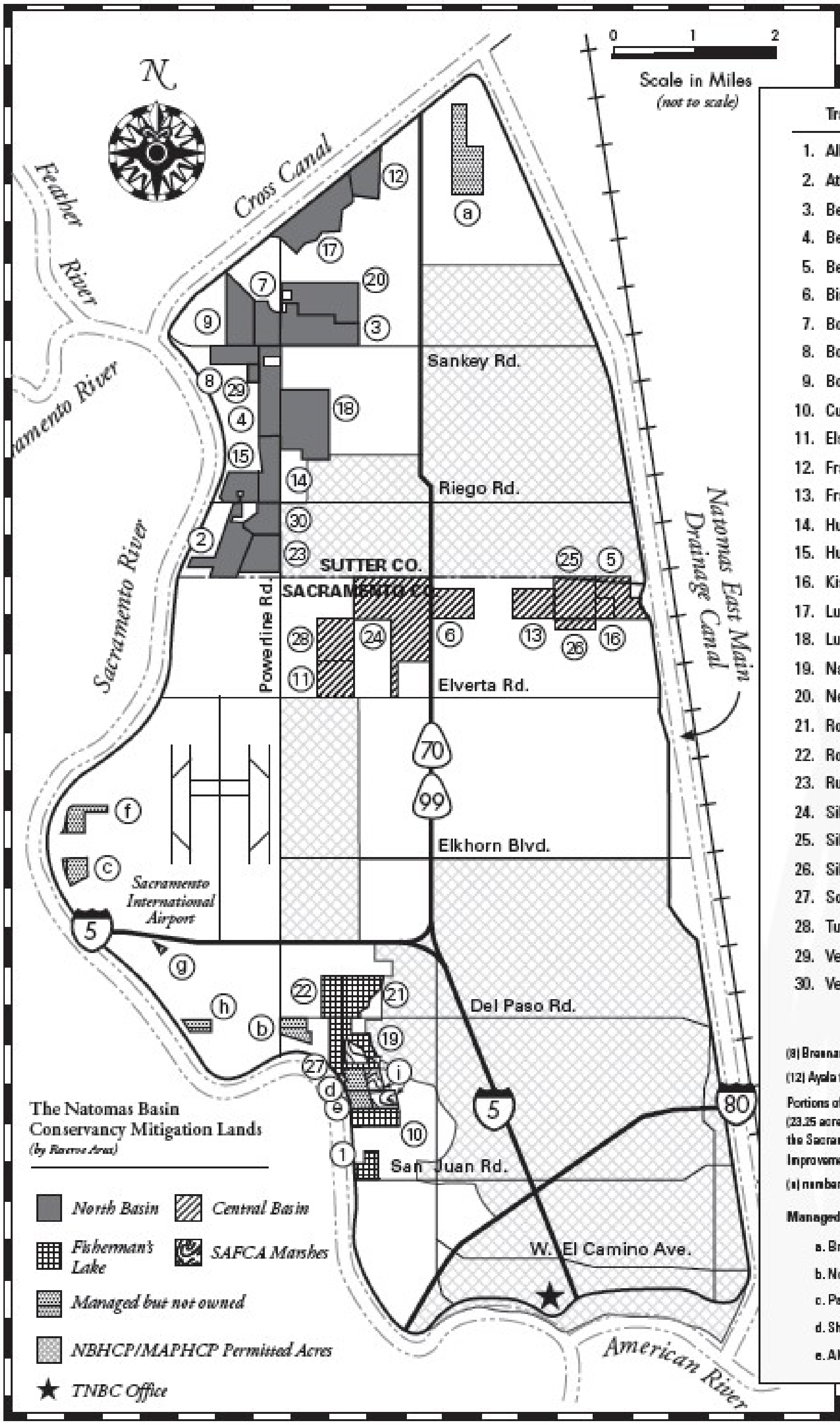
**Figure 7. Acquisition of mitigation lands by Natomas Basin Conservancy**




Source: Natomas Basin Conservancy (2001-2018).

[72] County of Sacramento (2015); Natomas North Precinct Landowner Group (2015).

**Figure 8. Mitigation lands and permitted areas under NBHCP**




| | Tract | Acq. Date | Acres |
|---|---|---|---|
| 1. | Alleghany (14) | 11.07.02 | 50.26 |
| 2. | Atkinson (16) | 06.12.03 | 199.21 |
| 3. | Bennett North (4) | 05.17.99 | 226.68 |
| 4. | Bennett South (5) | 05.17.99 | 132.49 |
| 5. | Betts (2) | 04.05.99 | 138.99 |
| 6. | Bianchi West (28) | 11.07.06 | 110.16 |
| 7. | Bolen North (23) | 04.29.05 | 113.62 |
| 8. | Bolen South (24) | 04.29.05 | 102.38 |
| 9. | Bolen West (26) | 09.01.06 | 155.03 |
| 10. | Cummings (15) | 11.07.02 | 66.83 |
| 11. | Elsie (29) | 11.07.06 | 158.03 |
| 12. | Frazer North (9) | 07.31.00 | 92.60 |
| 13. | Frazer South (30) | 11.07.06 | 110.37 |
| 14. | Huffman East (19) | 09.30.03 | 135.75 |
| 15. | Huffman West (18) | 09.30.03 | 157.76 |
| 16. | Kismat (3) | 04.16.99 | 40.46 |
| 17. | Lucich North (6) | 05.18.99 | 267.99 |
| 18. | Lucich South (7) | 05.18.99 | 351.89 |
| 19. | Natomas Farms (11) | 07.09.01 | 55.28 |
| 20. | Nestor (27) | 09.01.06 | 233.16 |
| 21. | Rosa East (21) | 03.23.05 | 106.28 |
| 22. | Rosa Central (22) | 03.23.05 | 100.02 |
| 23. | Ruby Ranch (17) | 06.23.03 | 91.08 |
| 24. | Sills (13) | 07.15.02 | 436.41 |
| 25. | Silva (1) | 01.07.99 | 159.20 |
| 26. | Silva South 1 (31) | 09.28.12 | 29.12 |
| 27. | Souza (10) | 07.02.01 | 40.00 |
| 28. | Tufts (20) | 09.29.04 | 147.95 |
| 29. | Verona (25) | 09.20.18 | 16.00 |
| 30. | Vestal (25) | 09.12.05 | 94.95 |
| | | | 4,119.93 |

(8) Brennan tract, acquired 6.15.00, exchanged 9.1.06. (242.38 acres)

(12) Ayala tract, acquired 2.20.02, exchanged 11.3.06. (317.37 acres)

Portions of the Atkinson tract (6.76 acres), the Huffman West tract (23.25 acres), and the Natomas Farms tract (41.27 acres) were sold to the Sacramento Area Flood Control Agency for the Natomas Levee Improvement Program (NLIP).

(x) number in parentheses represents chronological order of acquisition

**Managed but not owned (SAFCA)**

- a. Brookfield 190.00 acres
- b. Novak 52.753 acres
- c. Pappa Rosa 35.77 acres
- d. Sharma 20.81 acres
- e. AKT 16.01 acres
- f. South Sutter 75.09 acres
- g. Willey 4.69 acres
- h. Hewitt 23.930 acres
- i. SAFCA marshes 132.26 acres


Revision Date: 04.16.2019

Source: Reprinted from Natomas Basin Conservancy (2019).

The NBHCP authorizes development of up to 17,500 acres within the Natomas Basin, of which 8,050 acres are within the City of Sacramento, 1,983 acres within Metro Air Park and 7,467 acres within Sutter Pointe.[73] In order to mitigate the effects of that development on 22 endangered and threatened species within the Natomas Basin, developers are required to purchase and assign to NBC certain lands for preservation as habitat. The accumulation of lands by NBC is shown in Figure 7, and currently NBC owns and maintains 4,104 acres in the basin. Those mitigation lands support 6,975 acres for which grading is authorized, including lands within Sutter Pointe. Figure 8 maps both the lands owned by NBC for mitigation, and the lands permitted for development under the NBHCP.

Once lands have been placed into mitigation, they are dedicated 50 percent to managed marsh, 25 percent to cultivation of rice and 25 percent to upland habitat. To support irrigation on most of those lands, NBC receives deliveries of surface water from the Sacramento River via NCMWC, but for some lands supplements those supplies with groundwater withdrawn from the North American Subbasin. As development occurs in the Natomas Basin, including Sutter Pointe, significant lands will be set aside for permanent mitigation, and NCMWC will be called upon to deliver significant quantities of irrigation water for habitat purposes. As described in Section 6, NCMWC holds water rights and infrastructure that are capable of meeting the irrigation needs of NBC lands, either with or without the development of Sutter Pointe.

## 2.6 Water Supplies in the Natomas Basin

Historically, agricultural and urban land uses in the Natomas Basin have used water from five sources:

- Surface water diverted from the Sacramento River by NCMWC;
- Surface water diverted from the Sacramento River by individual landowners;
- Groundwater produced from the North American Subbasin by individual landowners;
- Agricultural tailwater, which is captured and recycled by NCMWC through the drainage system owned by RD 1000;[74] and
- Water from the City of Sacramento's public water system, which is a mixture of surface water from the Sacramento and American Rivers and groundwater from the North American and South American Subbasins.

Those sources have been used since development of the Natomas Basin for agricultural and urban purposes, and have been in place in their current form for over 50 years, since approximately the mid-1960s. The quantity of each source used during each year has varied based on hydrologic conditions, weather, the level of urban development in place, crops planted and agricultural practices.

In preparation for Sutter Pointe, Luhdorff & Scalmanini Consulting Engineers, Inc. ("LSCE") made a comprehensive estimate of the water sources used within the Natomas Basin as of 2004. Those sources are listed in Table 4 and shown in Figure 9. The single largest source of water, accounting for approximately 60 percent, was the Sacramento River, as diverted by NCMWC and individual landowners. Groundwater made up approximately 15 percent, recycled agricultural tailwater 17 percent, and supplies from the City of Sacramento 8 percent. The general areas in which each source was used are shown in Figure 10. Note that there is no area that relies exclusively on recycled agricultural tailwater; that source is pumped from the drainage system back into the irrigation canals of NCMWC and distributed widely to shareholder lands.

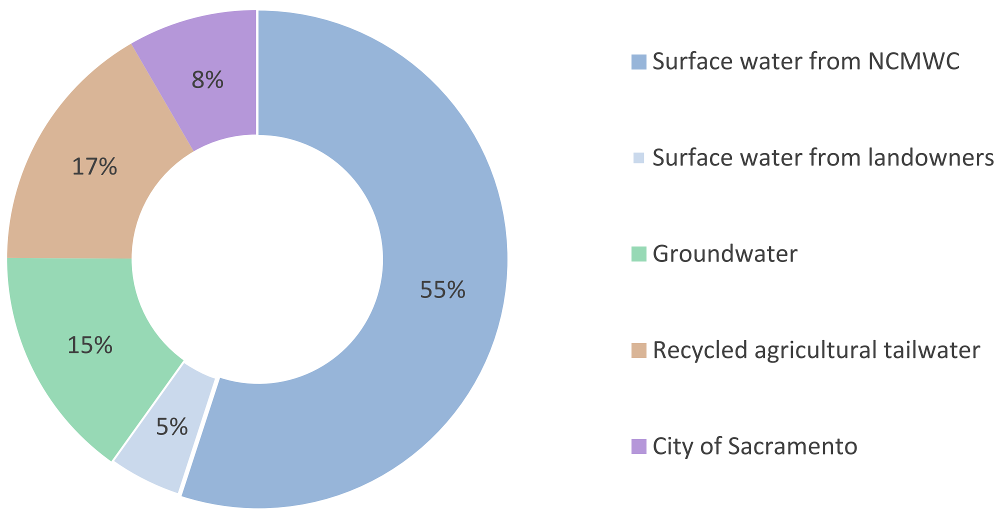
[73] City of Sacramento (2003), Table III-1, p. III-2.

[74] The tailwater recycling system relies on pump stations that divert water from the lower-elevation drain system to the higher-elevation irrigation canal system. While the system was developed over a number of years, it was completed in 1986 as a result of efforts to reduce discharges of tailwater to the Sacramento River during the irrigation season over water quality concerns.

| Table 4. Water supplies in the Natomas Basin, 2004 | | | |
|---|---|---|---|
| | **Sutter County** | **Sacramento County** | **Total** |
| Surface water diverted by NCMWC | 52,706 | 50,994 | 103,700 |
| Surface water diverted by landowners | 5,966 | 3,226 | 9,191 |
| Groundwater produced by landowners | 18,527 | 10,109 | 28,636 |
| Recycled agricultural tailwater | 15,431 | 15,807 | 31,238 |
| City of Sacramento | 0 | 15,771 | 15,771 |
| **Total** | **92,630** | **95,907** | **188,537** |

Source: Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), Table 2-2.

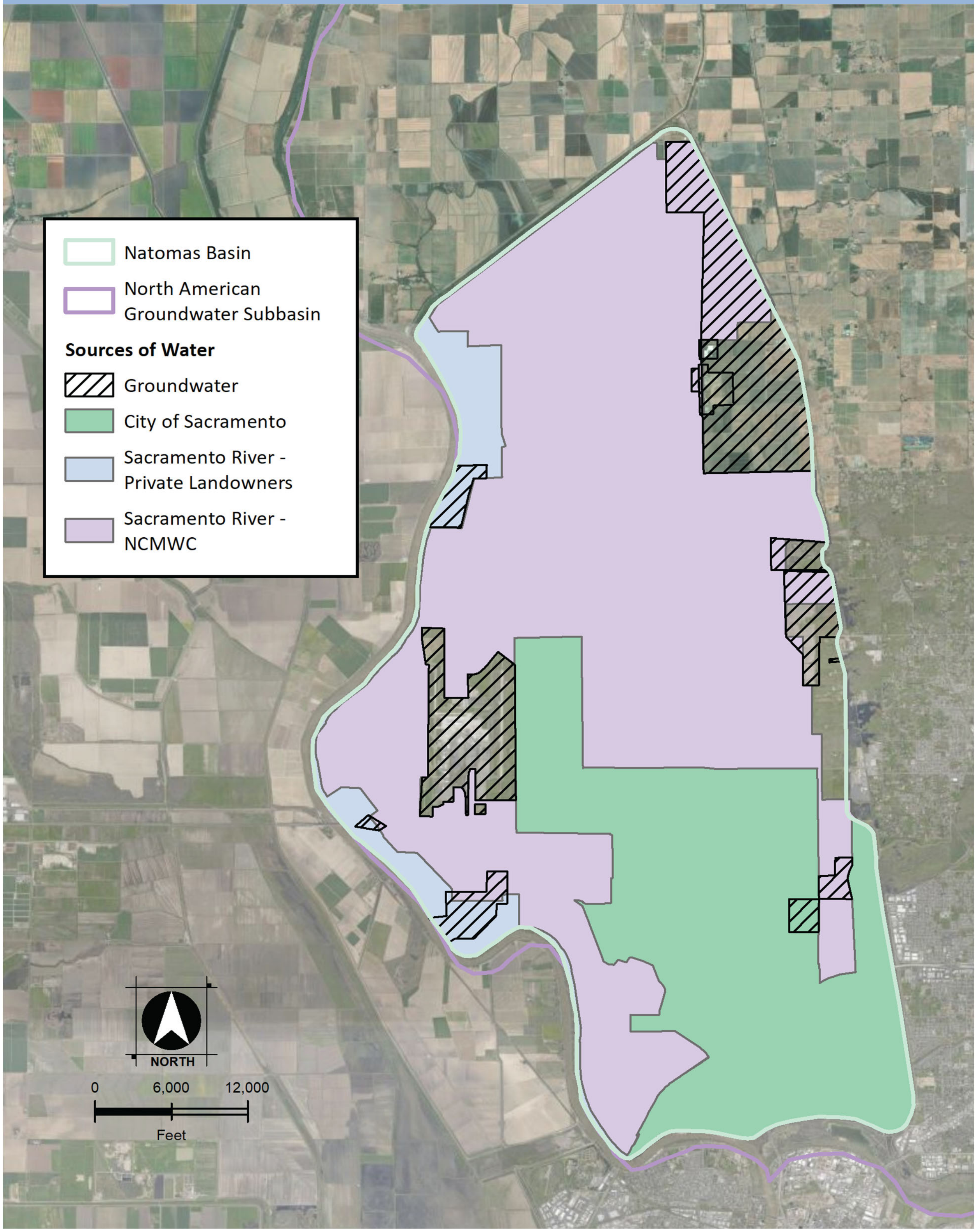
**Figure 9. Water supplies in the Natomas Basin, 2004**




Source: Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), Table 2-2.

Although 16 years have passed since 2004, land and water uses within the Natomas Basin have not changed in a manner that would require use of a different baseline for purposes of this Supplement. The only conversion of land from agricultural to urban uses between 2004 and 2020 has been the partial construction of Metro Air Park, but land and water uses within the Natomas Basin are otherwise similar. In particular, there have been no changes to land and water uses within Sutter Pointe. The land and water uses, and resulting impacts on groundwater, that were modeled by LSCE in 2008 accurately capture the proposed development of Sutter Pointe and the Project in the context of the Natomas Basin, because urban conversions have continued as estimated in that study, except that the timing of conversion has generally been delayed. Therefore, this Supplement uses the 2004 baseline and future scenarios established by LSCE to assess the availability of groundwater for the Project and Sutter Pointe.

**Figure 10. Areas served from various water sources, 2020**



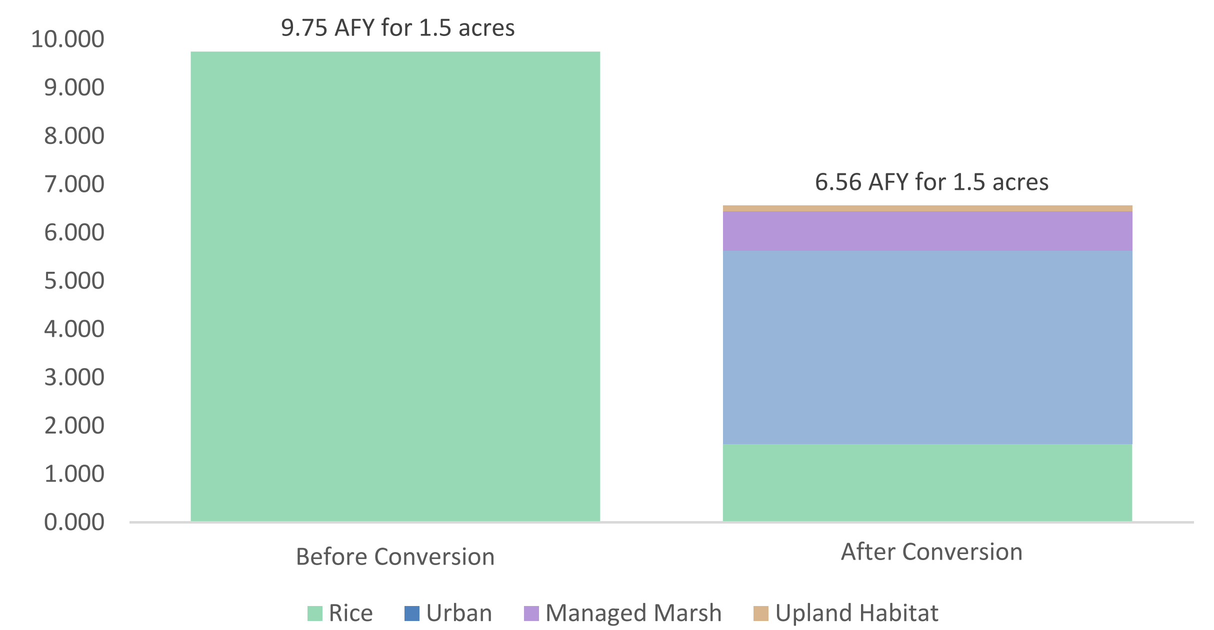

Source: Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), Figure 2-3; updated based on best available knowledge.

## 2.7 Conversion of Use for Land and Water

In past, as lands in the Natomas Basin have been redeveloped from agricultural to urban uses, the sources of water supplies have changed. As described in Section 2.4, the South Natomas, North Natomas, Metro Air Park and Greenbriar developments were (or will be) connected to the municipal water system owned by the City of Sacramento, either directly or through a wholesale arrangement. Upon conversion, those lands are supplied with water from the City of Sacramento portfolio, rather than from NCMWC or its predecessors. Other developments within the Natomas Basin, such as Sacramento International Airport and various industrial facilities, began producing groundwater from the North American Subbasin beneath their properties, which also resulted in cessation of use of supplies from NCMWC on those lands. Some planned projects, such as Sutter Pointe and Grandpark, plan to conjunctively use surface water purchased from NCMWC and groundwater from the North American Subbasin. For other planned projects, such as Upper Westside and the West and South Precincts, water supplies are not yet known.

In all cases, however, urban development changes the use of water from irrigation of crops to indoor human uses and irrigation of yards, parks and landscaping. The overall change in water use follows a similar pattern. As noted above, the predominant crop grown in the Natomas Basin is rice, which has an irrigation demand of approximately 6.5 AFY per acre.[75] When an acre of rice field is converted to urban use, the irrigation demands of rice cease and are replaced by urban demands of the new development. As estimated in Section 4, urban demands of the Project are expected to be approximately 4.0 AFY per acre on a development-wide basis, which is less than the irrigation demands of rice.

**Figure 11. Effect on annual water demands from conversion of land**



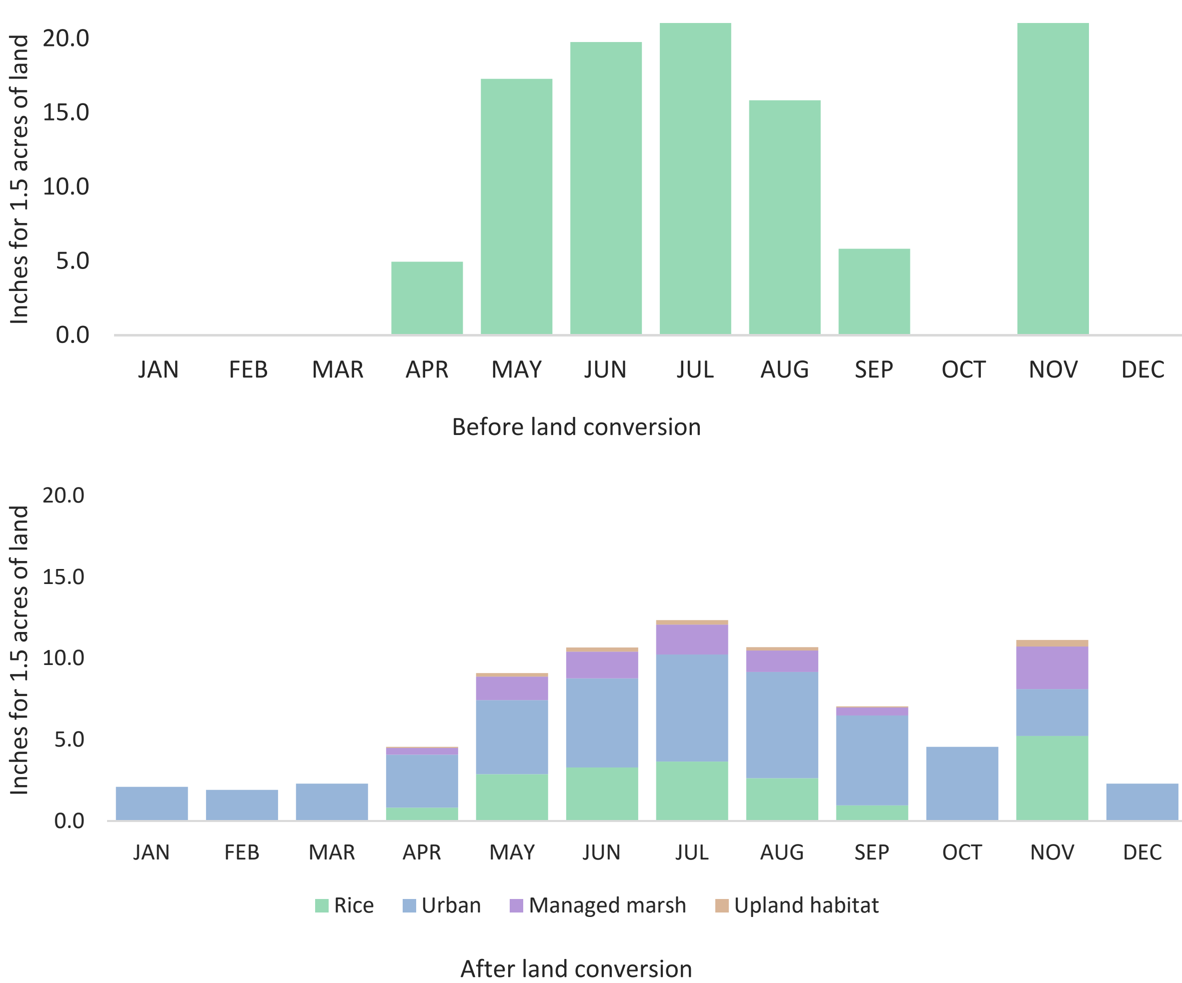

As discussed in Section 2.5, the County of Sutter has entered into the NBHCP for all lands within Sutter Pointe. That plan requires that when one acre of land is redeveloped for urban use, one-half acre will be dedicated as mitigation land under the management of NBC. Mitigation lands will be managed 50 percent as rice production, 25 percent as marshlands, and 25 percent as upland habitat. Those areas are expected to have per-acre water demands of 6.5 AFY for rice and marshlands and 1.0 AFY for upland habitat. When one acre of land is converted

[75] Natomas Central Mutual Water Company (2006), p. 12, Table 1.

from rice production to urban use, the overall impact on water demands must account for the acre being developed and the one-half acre being dedicated to mitigation. The overall impact is illustrated in Figure 11. As depicted, the overall effect of converting one acre of rice field into urban use is a decrease of total water demands for 1.5 acres—one acre of rice field in the project plus one-half acre of rice field elsewhere in the Natomas Basin—from 9.75 AFY to 6.56 AFY, which is a reduction of approximately one-third. While the urban development of previously unused lands results in increased water demands over historical conditions, the same is not true for lands that were previously used for intensive agriculture. When converting rice lands in the Natomas Basin, urban development actually decreases water demands.

The preceding discussion focuses on the annual volume of water to be used before and after conversion. However, conversion of land from rice production to urban and mitigation uses also has a time effect, since irrigation water uses are limited to the summer growing season, and urban uses are year-round. Figure 12 illustrates the change on a monthly basis. As seen in that figure, water use for urban development is spread across all months of the year, but summer peak usage is lower than for agriculture. For example, the highest month of irrigation water for rice in the Sacramento Valley is July, at 22.0 inches of water for cultivation of 1.5 acres. After conversion of 1.0 acre to urban land use, water demands in July are a total of 12.4 inches of water for that development and 0.5 acre of mitigation land (a combination of rice, managed march and upland habitat). November is an outlier month, because of the common use of reflooding for rice stalk decomposition after harvesting within the Natomas Basin.

**Figure 12. Effect on monthly water demands from conversion of land**



## 2.8 History of Water Use on Sutter Pointe Lands

### 2.8.1 Land Use

As described in Section 2.2, lands within Sutter Pointe were developed for intensive agriculture beginning in the 1910s, as part of broader development of the Natomas Basin. Since approximately 1950, lands within Sutter Pointe have been exclusively used for agricultural production, with the exception of a few parcels that have been redeveloped as business properties as discussed in Section 2.4.3. Land use surveys conducted by DWR in 2014 and 2016 were used to create an estimate of average land uses within Sutter Pointe over the past decade of the 2010s, as listed in Table 5. The survey from 2004 is included in the table as a comparison because that year was used as the basis for land and water uses in the WSA.

**Table 5. Land uses in Sutter Pointe**

| Land Use | 2004 | 2014 | 2016 | 2010s Average | 2010s Average |
|---|---|---|---|---|---|
| Agriculture – rice | 6,290 | 5,490 | 5,670 | 5,580 | 80% |
| Agriculture – grain and hay | 470 | 60 | 230 | 145 | 2% |
| Agriculture – pasture | 40 | 30 | 30 | 30 | 0% |
| Agriculture – wheat | 0 | 100 | 40 | 70 | 1% |
| Agriculture – fallow lands | 300 | 810 | 540 | 675 | 10% |
| Undeveloped | 200 | 200 | 200 | 200 | 3% |
| Business properties | 290 | 290 | 290 | 290 | 4% |

Note: All figures in acres, except the far right column expressed in percent.
Source: California Department of Water Resources (2004); Land IQ, LLC (2014, 2016).

It is important to note that the land and water use figures in this Section 2.8 are good faith estimates based on best available information. Precise figures are often not available, based on inaccuracies inherent in land and water surveys and limited record-keeping by agricultural producers. In particular, the land use surveys in 2014 and 2016 total an average of 6,990 acres out of the total Sutter Pointe area of 7,530 acres. The difference is attributable to survey methods and nonconformity of land surveys to GIS measurements of land area. Because the land surveys resulted in less acreage than the total, it is likely that estimates of land and water uses contained in this Section 2.8 are somewhat lower than reality.

For purposes of understanding water use, lands within Sutter Pointe may be divided into two parts:

- Roughly two-thirds of Sutter Pointe lands (5,010 acres) are located inside the corporate boundaries of NCMWC,[76] and approximately 4,440 acres of those lands have been historically owned by shareholders and received deliveries of irrigation water from the company. Some landowners within that area have supplemented surface water received from NCMWC with groundwater pumped from private wells.
- The remaining one-third of Sutter Pointe lands (2,520 acres) are located outside the corporate boundaries of NCMWC, generally on the eastern side of Sutter Pointe. Approximately 2,250 acres of those lands have been irrigated using groundwater pumped from private wells.

[76] Tully & Young (2008), p. 20.

### 2.8.2 Surface Water Use on Sutter Pointe Lands

Approximately two-thirds (5,010 acres) of Sutter Pointe lands are located within the corporate boundaries of NCMWC, and the company has historically delivered water to 43 shareholder-owned fields covering a cumulative 4,440 acres. The WSA estimated that NCMWC delivered an average of 30,000 AFY to those lands in the years preceding publication of that document, with 22,000 AFY being surface water from the Sacramento River and 8,000 AFY being recycled agricultural tailwater (which is derived from a combination of surface water and groundwater previously used to irrigate lands within the NCMWC service area).[77]

In support of the WSA, LSCE (2008) estimated the use of water on Sutter Pointe lands during 2004.[78] That year was chosen because it was the most recent year for which DWR had published land use maps at the time. LSCE estimated that water demands on the Sutter Pointe lands totaled 36,700 AFY, as listed in Table 6. Of that amount, approximately 21,900 AF were satisfied from surface water, 8,400 AF were from groundwater, and 6,400 AF were from recycled agricultural tailwater. According to that estimate, NCMWC delivered 28,300 AF to the Sutter Pointe lands in 2004, and landowners pumped an additional 8,400 AF of groundwater. The proportions of each source are shown in Figure 13.

**Table 6. Water uses on Sutter Pointe lands, 2004**

| Land Use | Water use (AF) |
|---|---:|
| Agriculture – rice | 35,860 |
| Agriculture – grain or hay | 140 |
| Agriculture – pasture | 180 |
| Agriculture – fallow lands | 0 |
| Native vegetation | 0 |
| Rural residences | 60 |
| Business properties | 440 |
| Roadways and miscellaneous | 0 |
| **Total** | **36,700** |

Source: Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), p. 19, rounded to nearest 10 AFY.

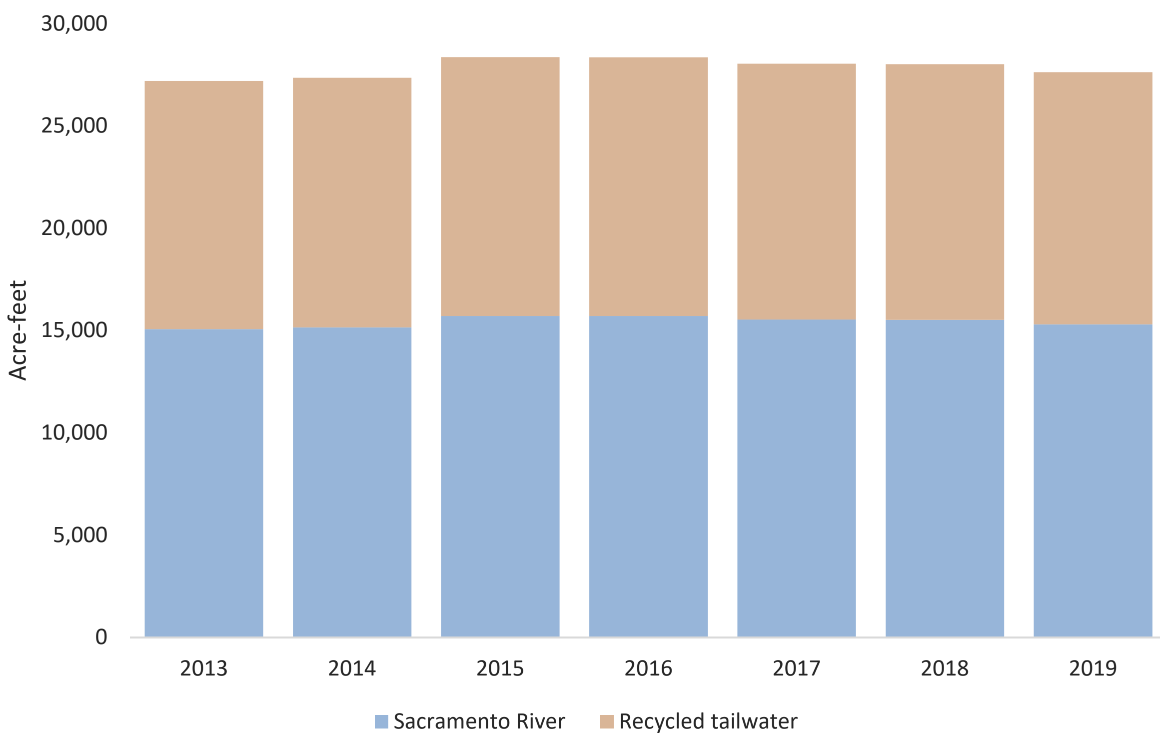
**Figure 13. Sources of irrigation water for Sutter Pointe lands, 2004**


Source: Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 12-15, rounded to nearest 100 AFY.

[77] Tully & Young, Inc. (2008), pp. 22-23.
[78] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 12-15, Table 2-2.

During the seven-year period from 2013 through 2019, NCMWC delivered an average of 27,800 AFY to shareholders within Sutter Pointe, as shown in Figure 14. Those deliveries consisted of an average of 15,400 AFY of surface water diverted from the Sacramento River and 12,400 AFY of agricultural tailwater that is recycled within the NCMWC distribution system. The overall quantity of water delivered by NCMWC to lands within Sutter Pointe are similar to LSCE's estimate from 2004: 27,800 AFY for recent deliveries compared to 28,300 AF during 2004, a difference of less than 2 percent. However, NCMWC has increased the amount of recycling within its system, and consequently reduced the amount of first Sacramento River diversions delivered to Sutter Pointe. For purposes of this Supplement, average deliveries for the 2013-2019 period are used as the baseline for Sutter Pointe lands, since they are more reflective of current conditions than the LSCE estimate for 2004.

**Figure 14. NCMWC water deliveries to Sutter Pointe lands, 2013-2019**




Source: Personal communication with Brett Gray, General Manager, NCMWC (June 4, 2020).

### 2.8.3 Groundwater Use on Sutter Pointe Lands

Development of groundwater in the Sacramento Valley began in 1879 with drilling of a well on the Blowers Ranch near Woodland, California, located across the Sacramento River from the Subbasin. Use of groundwater for irrigation purposes began immediately thereafter, at least partly in response to a drought that limited the availability of surface water during the summer of 1880. The success of that well led to construction of others in the Sacramento Valley, and the Woodland district contained 24 irrigation wells by 1901.[79] Groundwater pumping increased steadily in the early 1900s and then more rapidly following the invention of an improved deep-well turbine pump around 1930.[80]

[79] Olmstead & Davis (1961), p. 7, *citing* Chandler (1901), p. 25.

[80] Williamson, Prudic & Swain (1989), p. D44.

By 1913, the Subbasin had been developed with 81 irrigation wells, which supplied water to crops covering approximately 1,450 acres.[81] In the Natomas Basin portion of the Subbasin, landowners drilled wells and pumped groundwater before 1912,[82] and Natomas Company constructed four groundwater wells between 1911 and 1918.[83] By 1931, Natomas Company had drilled nine wells with combined capacities of 10,000 GPM.[84]

Before 1931, surface water from the Sacramento River was sufficient to meet most irrigation water demands in the basin, and groundwater was used as a supplemental source of irrigation water during summer months, creating a more dependable yield from those combined sources.[85] 1931 itself was a dry year, and the Natomas mutual water companies voluntarily pumped groundwater so they could leave surface water in the Sacramento River for use by other diverters without ready access to other sources.[86] In addition, Natomas Company continued to construct wells and pump groundwater to irrigate lands within the Natomas Basin that were not able to be supplied from the Sacramento River using the distribution canals of the mutual water companies. Most of those lands were located in the northeastern portion of the Natomas Basin, such as where the Project will be located.[87]

While we know that groundwater wells were drilled and pumped prior to 1950, there is little information regarding the magnitude of those operations. Early wells were not equipped with meters or other means of measuring the quantity of groundwater pumped, and any records of groundwater use that may have been kept by well owners were not retained in a systematic way or reported to governmental authorities. As noted above, groundwater production in the Natomas Basin was by individual landowners, and not by the mutual water companies.

Since 1950, most agricultural lands within the Natomas Basin have been supplied with surface water delivered by the Natomas mutual water companies or diverted directly from the Sacramento River. Some landowners supplemented surface water purchases with groundwater produced by their own wells, and other landowners relied exclusively on groundwater. As with the pre-1950 period, our knowledge of groundwater use is limited. However, studies have estimated groundwater use between 1961 and 2004 as shown in Table 7. In planning for Sutter Pointe, the WSA estimated the use of water resources in the Natomas Basin during 2004, with separate figures for the area to be covered by Sutter Pointe. As shown in Figure 13, the study estimated that landowners within Sutter Pointe used 8,400 AF of groundwater during 2004.

This Supplement estimates the quantity of groundwater used on Sutter Pointe lands during the 2010s based on the difference between total water demands and the water supplies derived from NCMWC. Total water demands are estimated in Table 8 based on the land uses set forth in Table 5 and applied water factors from NCMWC (2006). This method estimates that recent average water uses on the Sutter Pointe lands are approximately 37,300 AFY, which was derived 15,400 AFY from surface water and 12,400 AFY from recycled agricultural tailwater. Those figures produce an estimate of 9,500 AFY derived from groundwater on average during the 2010s.

[81] Bryan (1916), p. 46.
[82] Adams (1912), p. 79.
[83] Bryan (1916), p.18; Bryan (1923), p. 174; Castaneda, Docken, Pitti & Ide (1984), p. 290; Natomas Company of California (1919), p. 5 ("Four deep wells were sunk on the high lands in the eastern part of the [Natomas Basin] and showed the possibilities of watering these lands at a reasonable cost"); Olmstead & Davis (1961), p. 205.
[84] Natomas Company (1931a) (map including locations of wells with capacities); Natomas Company of California (1925), p. 3.
[85] California Department of Public Works, Division of Water Resources (1931), p. 526.
[86] Natomas Company (1931b). That operation was akin to an early groundwater substitution-based water transfer, albeit without compensation from the users to the Natomas mutual water companies.
[87] Natomas Company of California (1926), p. 3.

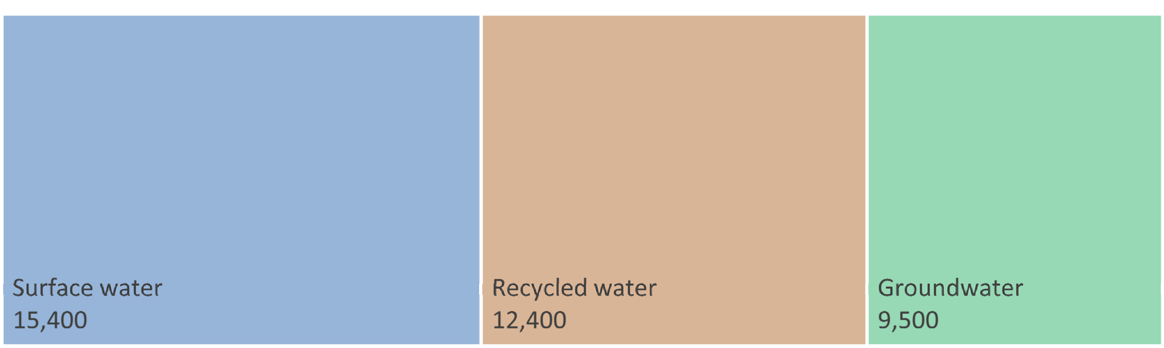
| Table 7. Prior studies of groundwater use in the Natomas Basin | | |
|---|---|---|
| Study | Study period | Average use of groundwater (AFY) |
| United States Geological Survey (1983) | 1961-1977 | 32,000 |
| California Department of Water Resources (1997) | 1970-1990 | 19,000 |
| California Department of Water Resources (1978) | 1961, 1970 | 28,000 |
| Natomas Central Mutual Water Company (2002) | 1970-1990 | 20,000 |
| California Department of Water Resources (2003) | 1990, 1998 | 15,000 |
| WRIME (2005) | 2004 | 30,300 |
| LSCE (2008) | 2004 | 28,600 |

Source: Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), Table 2-1; WRIME (2005), p. 5.

| Table 8. Water uses on Sutter Pointe lands during 2010s | | | |
|---|---|---|---|
| Land Use | Land use (acres) | Water factor (AFY/acre) | Water use (AFY) |
| Agriculture – rice | 5,580 | 6.5 | 36,270 |
| Agriculture – grain and hay | 145 | 2.5 | 360 |
| Agriculture – pasture | 30 | 5.3 | 150 |
| Agriculture – wheat | 70 | 0.8 | 60 |
| Agriculture – fallow lands | 675 | 0.0 | 0 |
| Undeveloped | 200 | 0.0 | 0 |
| Business properties | 290 | 1.5 | 440 |
| **Totals** | **7,530** | | **37,300** |

Source: Natomas Central Mutual Water Company (2006), p. 12; Table 5.

**Figure 15. Sources of irrigation water for Sutter Pointe lands, 2010s**



### 2.8.4 Groundwater Use on Project Lands

This Supplement focuses on the 873.5 acres on which the Project will be located. Since approximately 1950, all Project lands have been used for productive agriculture, with the exception of seasonal fallowing. As estimated in Table 9, water demands on the Project lands were approximately 4,200 AFY during the 2010s. Since NCMWC does not deliver any surface water or recycled tailwater to those lands, 100 percent of those demands were derived from groundwater.

**Table 9. Water uses on Project lands during 2010s**

| Land Use | Acreage in 2014 | Acreage in 2016 | Average acreage | Water factor (AFY/acre) | Water use (AFY) |
|---|---|---|---|---|---|
| Agriculture – rice | 630 | 610 | 620 | 6.5 | 4,000 |
| Agriculture – grain and hay | 110 | 50 | 80 | 2.5 | 200 |
| Agriculture – fallow lands | 130 | 210 | 170 | 0.0 | 0 |
| **Total** | | | | | **4,200** |

Source: Land IQ, LLC (2014, 2016). Land acreages are rounded to the nearest 10 acres and water uses to the nearest 100 AFY.

## 2.9 Conclusions

Lands within the Natomas Basin, including Sutter Pointe, have been developed for intensive agriculture since the 1910s. For over 100 years, the area has been served with surface water from the Sacramento River, based on water rights held by NCMWC and its predecessor companies. In addition, some landowners have produced groundwater from the North American Subbasin that underlies the Natomas Basin, using private groundwater wells. NCMWC has recycled agricultural tailwater generated from both surface water and groundwater. During the 2010s, lands on which the Project and Sutter Pointe will be developed were served with water as set forth in Table 10.

**Table 10. Historical water supplies used on Sutter Pointe and Project lands**

| Water supply | Source | Sutter Pointe lands | Project lands |
|---|---|---|---|
| Surface water | NCMWC | 15,400 | 0 |
| Recycled tailwater | NCMWC | 12,400 | 0 |
| Groundwater | Landowners | 9,500 | 4,200 |
| **Total** | | **37,300** | **4,200** |

Since the 1960s, urban development has been expanding outward from the downtown core of the Sacramento region. Within the Natomas Basin, this has led to development of South Natomas, North Natomas, Sacramento International Airport, Metro Air Park and a few scattered business properties. A number of developments are in various stages of planning, including Greenbriar, Grandpark, Upper Westside, West Precinct and South Precinct in Sacramento County and Sutter Pointe in Sutter County. Once those projects are completed, no further urban developments are expected within the Natomas Basin, and other lands will remain for use as agriculture, mitigation and airport management areas.

In general terms, conversion of agricultural lands within the Natomas Basin for urban development will result in reduced water demands. As described in Section 3, water demands for Sutter Pointe are projected to be approximately 25,200 AFY, a 32 percent reduction from average agricultural use of 37,300 AFY during the 2010s. As set forth in Section 4, water demands for the Project are projected to be 3,500 AFY, a 17 percent reduction from 4,200 AFY of historic agricultural uses.

# Section 3 Water Planning for Sutter Pointe

## 3.1 Overview of Sutter Pointe

Sutter County first envisioned urban development of the Sutter Pointe area in its General Plan published in 1996. In that plan, the County designated 10,500 acres as future Industrial/Commercial Reserve in lieu of historical agricultural use.[88] However, until planning for Sutter Pointe, the area enjoyed only limited industrial development, due to the lack of infrastructure and patterns for development in the Sacramento region.

In 2004, a group of developers, landowners and political leaders crafted a proposal to develop 7,500 acres of the Industrial/Commercial Reserve for mixed land uses, integrated with the NBHCP. The voters of Sutter County approved the proposal by ballot Measure M in November 2004, including the development of at least 3,600 acres for industrial and commercial uses, no more than 2,900 acres for residential uses, at least 1,000 acres for public facilities, including parks and open space, and all necessary infrastructure.[89] Between 2004 and 2009, the proposed developers created a land use plan for the Measure M area that became known as Sutter Pointe. The Sutter Pointe Specific Plan was approved by the Sutter County Board of Supervisors in June 2009, along with an environmental impact report and ancillary planning documents.

It was expected that Sutter Pointe would be developed in phases, with residential development occurring in four phases numbered 1 through 4, and commercial development occurring in four phases lettered A through D. Public facilities and infrastructure would be built as necessary to support residential and commercial developments. For purposes of infrastructure planning, including water supplies, it was anticipated that those phases would be developed roughly contemporaneously, with Phases 1 and A developed together from 2011 through 2017, Phases 2 and B constructed together from 2018-2022, Phases 3 and C constructed together from 2023-2025, and Phases 4 and D constructed together from 2026-2030.[90] The acreage of land uses for Sutter Pointe are shown in Table 11, broken down by type of development and phases.

As part of planning documents for Sutter Pointe, the County commissioned and adopted the *Sutter Pointe Specific Plan SB 610 Water Supply Assessment*, referred to in this Supplement as the WSA. Related water planning documents included the *Sutter Pointe Specific Plan Water Supply Master Plan* and *Sutter Pointe Specific Plan Groundwater Supply Assessment*.[91] The remainder of this Section 3 summarizes the water supply plans for Sutter Pointe, as set forth in those documents.

## 3.2 Water Demands

Water demands for Sutter Pointe were projected based on the anticipated demands of each type of land use, expressed in AF per acre, multiplied by the number of acres for each land use. Water demand factors were based on other land development projects in the Sacramento region, including the Panhandle Project within the City of Sacramento and Westborough Project within the City of Rancho Cordova, and the Sacramento County Water Agency Zone 40 Water Supply Master Plan. In addition to demands based on land use factors, the WSA assumed use of an additional 7.5 percent for non-revenue water. Water demand factors used for the WSA are listed in Table 12, and projected water demands for Sutter Pointe are listed in Table 13.

[88] EDAW, Inc. (2008a), p. 1-6.
[89] EDAW, Inc. (2008a), p. 1-7.
[90] Tully & Young (2008), pp. 2-3.
[91] MacKay & Somps Civil Engineers, Inc. (2008); Luhdorff & Scalmanini Consulting Engineers, Inc. (2008).

| Table 11. Acreage of land uses in Sutter Pointe | | | | | | |
|---|---|---|---|---|---|---|
| **Land Use** | | **Phase 1+A** | **Phase 2+B** | **Phase 3+C** | **Phase 4+D** | **Total** |
| Residential | High density residential | 91.4 | 0.0 | 57.8 | 38.5 | 187.7 |
| | Medium density residential | 874.8 | 491.9 | 331.3 | 252.3 | 1,950.3 |
| | Low density residential | 121.0 | 316.3 | 0.0 | 75.5 | 512.8 |
| | Residential roads | 127.2 | 48.4 | 40.1 | 28.5 | 244.2 |
| | **Total residential** | **1,214.4** | **856.6** | **429.2** | **394.8** | **2,895.0** |
| Commercial | Employment 1 | 96.8 | 100.9 | 188.5 | 194.2 | 580.4 |
| | Employment 2 | 380.3 | 611.4 | 506.2 | 492.6 | 1,990.5 |
| | Employment roads | 73.9 | 63.1 | 67.3 | 99.5 | 303.8 |
| | Commercial retail | 129.9 | 0.0 | 21.8 | 26.5 | 178.2 |
| | Mixed use | 100.8 | 0.0 | 0.0 | 63.3 | 164.1 |
| | Drainage basins | 50.6 | 116.3 | 145.0 | 102.4 | 414.3 |
| | **Total commercial** | **832.3** | **891.7** | **928.8** | **978.5** | **3,631.3** |
| Public facilities | Community parks | 99.4 | 181.8 | 67.0 | 83.7 | 431.9 |
| | Open space | 115.8 | 183.5 | 51.4 | 44.1 | 394.8 |
| | Schools | 114.0 | 20.9 | 21.0 | 18.7 | 174.6 |
| | **Total public facilities** | **329.2** | **386.2** | **139.4** | **146.5** | **1,001.3** |
| **Combined total** | | **2,375.9** | **2,134.5** | **1,497.4** | **1,519.8** | **7,527.6** |

Source: Tully & Young (2008), Table 1-1, p. 3.

| Table 12. Land use water demand factors for Sutter Pointe | | |
|---|---|---|
| **Category** | **Land Use** | **Demand Factor (AFY/acre)** |
| Residential | High density residential (399 units) | 4.67 |
| | Medium density residential (2,283 units) | 4.17 |
| | Low density residential (1,105 units) | 3.67 |
| Commercial | Employment | 3.00 |
| | Commercial | 3.00 |
| Public facilities | Schools | 3.67 |
| | Community parks | 4.08 |
| | Open space | 2.34 |
| | Drainage basins | 0.60 |
| | Roads | 0.20 |

Source: Tully & Young (2008), Tables 2-1 and 2-2, pp. 8-9.

| Table 13. Water demands for Sutter Pointe | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Phase 1+A | | Phase 2+B | | Phase 3+C | | Phase 4+D | | Total Buildout | |
| **Land Use** | **Demand Factor (AFY/acre)** | **Area (acres)** | **Water Demand (AFY)** | **Area (acres)** | **Water Demand (AFY)** | **Area (acres)** | **Water Demand (AFY)** | **Area (acres)** | **Water Demand (AFY)** | **Area (acres)** | **Water Demand (AFY)** |
| High density residential | 4.67 | 91.4 | 427 | 0.0 | 0 | 57.8 | 270 | 38.5 | 180 | 187.7 | 877 |
| Medium density residential | 4.17 | 874.8 | 3,648 | 491.9 | 2,051 | 331.3 | 1,382 | 252.3 | 1,052 | 1,950.3 | 8,133 |
| Low density residential | 3.67 | 121.0 | 444 | 316.3 | 1,161 | 0.0 | 0 | 75.5 | 277 | 512.8 | 1,882 |
| Employment | 3.00 | 477.1 | 1,431 | 712.3 | 2,137 | 694.7 | 2,084 | 686.8 | 2,060 | 2,570.9 | 7,713 |
| Commercial | 3.00 | 230.7 | 692 | 0.0 | 0 | 21.8 | 65 | 89.8 | 269 | 342.3 | 1,027 |
| Schools | 3.67 | 114.0 | 418 | 20.9 | 77 | 21.0 | 77 | 18.7 | 69 | 174.6 | 641 |
| Community parks | 4.08 | 99.4 | 406 | 181.8 | 742 | 67.0 | 273 | 83.7 | 341 | 431.9 | 1,762 |
| Open space | Varied | 115.8 | 317 | 183.5 | 570 | 51.4 | 96 | 44.1 | 64 | 394.8 | 1,047 |
| Drainage basins | 0.60 | 50.6 | 30 | 116.3 | 70 | 145.0 | 87 | 102.4 | 61 | 414.3 | 249 |
| Roads | 0.20 | 201.1 | 40 | 111.5 | 22 | 107.4 | 21 | 128.0 | 26 | 548.0 | 110 |
| **Subtotal** | | **2,375.9** | **7,853** | **2,134.5** | **6,831** | **1,497.4** | **4,356** | **1,519.8** | **4,401** | **7,527.6** | **23,441** |
| Non-revenue water | | | 589 | | 512 | | 327 | | 330 | | 1,758 |
| **Total water demands** | | | **8,442** | | **7,343** | | **4,683** | | **4,731** | | **25,199** |

Source: Tully & Young (2008), Table 2-3, p. 10.

Note that the categories of land use in this Table 13 are slightly different than those contained in Table 2-3 of the WSA, in order to more closely align the projected water demands of Sutter Pointe with those for the Project. Specifically, residential and employment roads are combined into a single category for roads, and commercial retail and mixed use are combined into a single category for commercial land use.

As seen in Table 13, total water demands for Sutter Pointe were projected to be approximately 25,200 AFY. SB 610 requires that a water supply assessment evaluate water supplies and demands in normal, single dry and multiple dry years. The WSA examined water demands in dry years for other systems in northern California, including those located in Alameda County, Clovis, the East Bay, Folsom, Modesto, Napa, San Francisco and Stockton, and concluded that a reduction of 12.5 percent could be expected in dry years when compared to normal years. Such a reduction would lead to total water demands of 22,050 AFY at buildout of the project in single dry and multiple dry years.[92]

## 3.3 Water Supplies

The WSA proposed that Sutter Pointe water demands be met from two sources: groundwater from the North American Subbasin; and surface water from the Sacramento River. The WSA presented three water supply scenarios, as summarized in Table 14. All scenarios included the use of groundwater to meet the demands of Phases 1 and A, while surface water would be used beginning with Phases 2 and B.

**Table 14. Water supply programs for Sutter Pointe**

| | Proposed Water Supply Program | Alternative A Water Supply Program | Alternative B Water Supply Program |
|---|---|---|---|
| Phase 1+A | | | |
| North American Subbasin | 8,442 | 8,442 | 8,442 |
| Sacramento River | 0 | 0 | 0 |
| **Total** | **8,442** | **8,442** | **8,442** |
| Phase 2+B and preceding phase | | | |
| North American Subbasin | 10,919 | 4,977 | 6,537 |
| Sacramento River | 4,867 | 10,809 | 9,249 |
| **Total** | **15,786** | **15,786** | **15,786** |
| Phase 3+C and preceding phases | | | |
| North American Subbasin | 11,486 | 6,544 | 6,270 |
| Sacramento River | 8,981 | 13,923 | 14,197 |
| **Total** | **20,467** | **20,467** | **20,467** |
| Phase 4+D and preceding phases | | | |
| North American Subbasin | 13,073 | 9,563 | 6,579 |
| Sacramento River | 12,128 | 15,638 | 18,622 |
| **Total** | **25,201** | **25,201** | **25,201** |

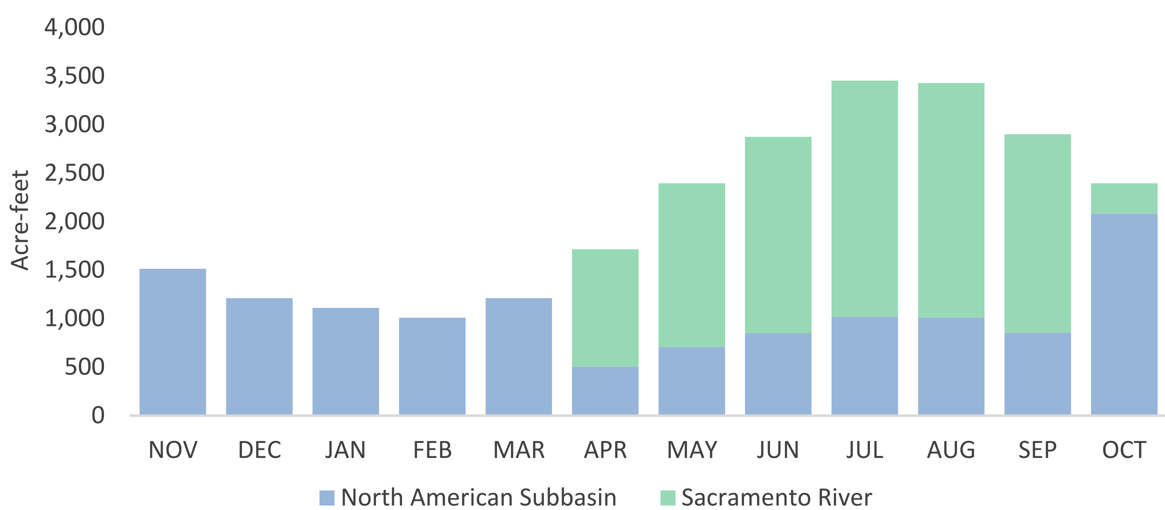
Source: Tully & Young (2008), Tables 3-9, 3-11, 3-13.

[92] Tully & Young (2008), pp. 12-14.

Under the Proposed Water Supply Program, groundwater would be used to meet all demands of the approximately one-third of Sutter Pointe lands that have not historically been owned by shareholders of NCMWC or received water from that company. For the two-thirds of Sutter Pointe lands that have historically been owned by shareholders of NCMWC, surface water would be used during the period from April through October of each year, and groundwater would be used from November through March. Surface water capacity would be approximately 29.3 MGD in a single water treatment plant, while groundwater capacity would be approximately 36.3 MGD from 16 wells, divided into two fields (western and eastern). Monthly use of water from each source is depicted in Figure 16.[93]

The Proposed Water Supply Program was designed to require a minimum level of change in the use of surface water from NCMWC under historical conditions, restricting its use to those lands to which water has been delivered based on share ownership, during the irrigation season. As seen in Table 14, the Proposed Water Supply Program results in the lowest use of surface water and the highest use of groundwater among the three scenarios. At the time the WSA was prepared, GSWC had not yet been named the water purveyor for Sutter Pointe, and the development did not yet have access to surface water supplies from NCMWC based on the Water Wholesale Agreement between those companies. As of preparation of this Supplement, GSWC has a contractual entitlement to delivery of water from NCMWC for use on any of the Sutter Pointe lands, as described in Section 6.4. Thus, the background that led to design of the Proposed Water Supply Program is no longer in place, and GSWC is not bound by the legal and institutional strictures of that program. It is useful for understanding one alternative way in which GSWC could use groundwater and surface water to meet the demands of Sutter Pointe and the Project.

**Figure 16. Use of water under Proposed Water Supply Program**

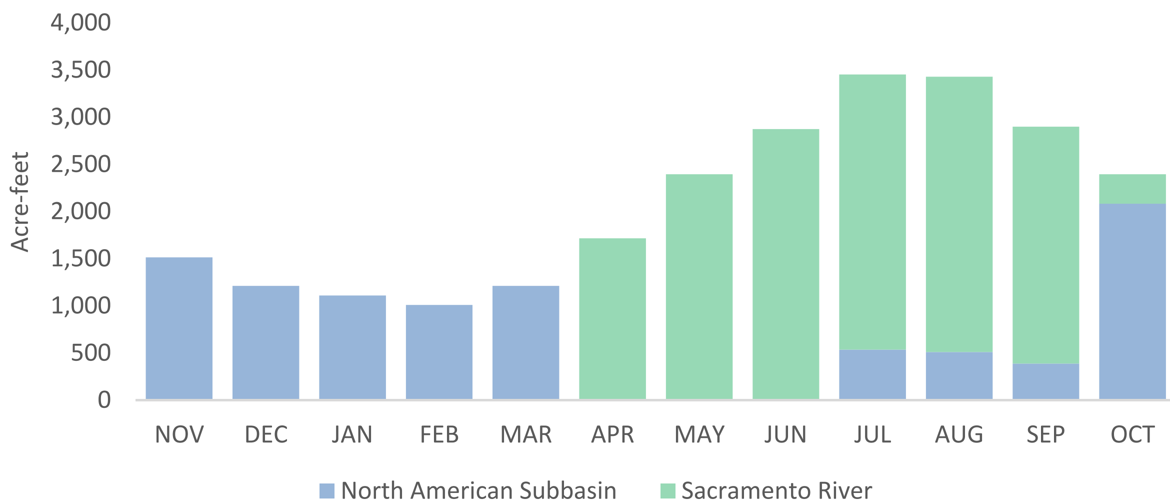



The Alternative A Water Supply Program would use groundwater to meet all water demands from November through March of each year, only surface water from April through June, and a combination of groundwater and surface water from July through October, as depicted in Figure 17. The WSA stated that Alternative A would use surface water on non-shareholder lands based on obtaining approval from NCMWC; as noted above, GSWC has reached agreement with NCMWC in the Water Wholesale Agreement that GSWC may use Sacramento River water on any Sutter Pointe lands, regardless of whether those lands were previously owned by shareholders in NCMWC.

[93] Tully & Young (2008), pp. 30-32; MacKay & Somps Civil Engineers, Inc. (2008), pp. 26-31.

In this program, surface water capacity would be approximately 35.1 MGD in a single water treatment plant, while groundwater capacity would be the same as under the Preferred Water Supply Program. Alternative A was designed to use surface water to the maximum extent during the irrigation season from April through September, but groundwater would be the exclusive source during the non-irrigation season from November through March. A small amount of groundwater would be used in order to limit the rate at which water would be taken from NCMWC and the size of the surface water treatment plant.[94]

**Figure 17. Use of water under Alternative A Water Supply Program**

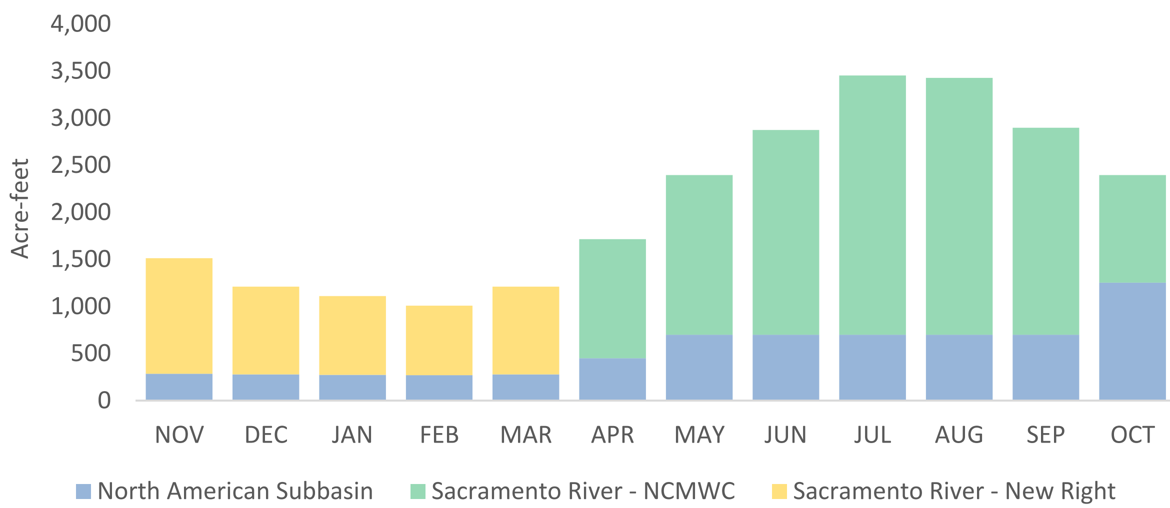



Under the Alternative B Water Supply Program, Sutter Pointe would use a combination of groundwater and surface water throughout the year, as depicted in Figure 18. During the irrigation season, this program would deliver surface water from NCMWC to all lands within Sutter Pointe, regardless of whether those lands were historically owned by shareholders. The water purveyor would need to obtain regulatory approvals from appropriate state and federal agencies to use water from NCMWC during the winter months from November through March, or apply for a new winter water right. Alternative B results in the highest use of surface water (18,662 AFY) and lowest use of groundwater (6,579 AFY) among the three alternatives.

For Alternative B, surface water capacity would be approximately 33.1 MGD in one water treatment plant, and groundwater capacity would be 20.7 MGD from 8 wells in a single wellfield. The capacity of the surface water treatment plant would be slightly lower in Alternative B (33.1 MGD) than Alternative A (35.1 MGD), because groundwater would be used to meet some demands from April through June, but both programs would have a higher capacity than under the Preferred Water Supply Program (29.3 MGD). Groundwater capacity would be much less for Alternative B (20.7 MGD) than in either Alternative A or the Preferred Water Supply Program (36.3 MGD in both). [95]

[94] Tully & Young (2008), pp. 33-34; MacKay & Somps Civil Engineers, Inc. (2008), pp. 22-35.
[95] Tully & Young (2008), pp. 35-36; MacKay & Somps Civil Engineers, Inc. (2008), pp. 36-39.

Figure 18. Use of water under Alternative B Water Supply Program




## 3.4 North American Subbasin

The WSA planned for Sutter Pointe to use groundwater produced from the North American Subbasin that underlies the development area.[96] Production of groundwater would range from a low of approximately 6,580 AFY under the Alternative B Water Supply Program to a high of 13,075 AFY under the Preferred Water Supply Program. Groundwater would be used during all four phases of Sutter Pointe, but would be the exclusive source of supply for Phases 1 and A.

The WSA analyzed the availability of groundwater for Sutter Pointe at the highest level, i.e., 13,075 AFY, and concluded that quantity of groundwater would be available through buildout, which at that time was expected to occur in 2030.[97] That conclusion was based on modeling of the North American Subbasin by Luhdorff & Scalmanini Consulting Engineers, Inc., as further described in Section 5.5.2.

## 3.5 Sacramento River

The WSA planned for Sutter Pointe to use surface water diverted from the Sacramento River beginning with Phases 2 and B.[98] Under the Preferred Water Supply Program at buildout, Sutter Pointe would use approximately 12,128 AFY of surface water, with the amount increasing to 15,638 AFY for the Alternative A Water Supply Program and increasing again to 18,622 AFY for the Alternative B Water Supply Program. Access to Sacramento River water would come from two sources: the historical water rights of NCMWC; and a new winter diversion right for which the water purveyor would apply under the Alternative B Water Supply Program. The WSA evaluated both methods by which Sutter Pointe could access water from the Sacramento River and determined necessary quantities would be available to the Project for the required planning horizon.[99]

[96] For more detailed description of the North American Subbasin, see Section 5.
[97] Tully & Young (2008), pp. 15-16.
[98] For more detailed description of the Sacramento River, see Section 6.
[99] Tully & Young (2008), pp. 16-29.

The mechanism for Sutter Pointe to gain access to Sacramento River water based on the historical rights of NCMWC has changed since adoption of the WSA, because of GSWC securing the Water Wholesale Agreement described in Section 6.4. Nevertheless, use of Sacramento River water would be similar under the WSA and this Supplement, and the conclusions in the WSA regarding sufficiency of that supply remain valid.

### 3.6 Conclusions

The WSA concluded that water demands for Sutter Pointe would be approximately 25,200 AFY at buildout during normal years and 22,050 AFY during single and multiple dry years. Those demands could be met using any one of three mixtures of groundwater from the North American Subbasin and surface water from the Sacramento River: the Preferred Water Supply Program; Alternative A Preferred Water Supply Program; or Alternative B Preferred Water Supply Program.

The WSA considered groundwater from the North American Subbasin to be an existing water supply. Maximum use of 13,075 AFY would supply all demands of Phases 1 and A, and at least 52 percent of total demands at buildout of Sutter Pointe. Based on technical work performed by Luhdorff & Scalmanini Consulting Engineers, Inc., the WSA concluded that sufficient groundwater would be available from the North American Subbasin to meet demands associated with Sutter Pointe under any of the alternative water supply programs as well as other existing and future planned groundwater uses for at least 20 years.

The WSA concluded that surface water from the Sacramento River would be available to Sutter Pointe based on the assignment of shares in NCMWC from the owners of Sutter Pointe lands to the water purveyor for the project. Access to surface water would require regulatory approvals from the SWRCB and USBR. The WSA concluded that those approvals would likely be obtained, and surface water would be available by 2018 for use within Sutter Pointe as described in any of the alternative water supply programs.

# Section 4 Project Water Demands

The Project will cover 873.5 acres in the southeastern portion of the Sutter Pointe area. The Project will convert utilization of the land from historical rice farming to a mixture of municipal and industrial developments, including residences, commercial centers and public facilities. As identified in this Section 4, water demands for the Project are projected to be approximately 3,500 AFY.

## 4.1 Water Demand Factors

Projected water demands for the Project are calculated based on a factor for each type of land use, and those factors are based on observed water demands for other urbanized lands in the Sacramento region. The water demand factors used in this Supplement for the Project are the same as those used in the WSA for Sutter Pointe and are set forth in Table 15. As described in Section 4.3, in the 12 years since preparation of the WSA, urban water demands have generally declined based on improvements in urban water efficiency, and thus the water demand factors in this Supplement likely overestimate the water demands of the Project. The consequence of that overestimation is to make this Supplement conservative for planning purposes.[100]

**Table 15. Land use water demand factors for the Project**

| Category | Land Use | Project Area (acres) | Demand Factor (AFY/acre) |
|---|---|---|---|
| Residential | High density residential – 399 units | 21.4 | 4.67 |
| | Medium density residential – 2,283 units | 360.3 | 4.17 |
| | Low density residential – 1,105 units | 240.9 | 3.67 |
| Commercial | Employment | 44.8 | 3.00 |
| | Commercial | 25.0 | 3.00 |
| Public facilities | Parks and recreation | 59.1 | 4.08 |
| | Open space – land | 15.6 | 0.60 |
| | Open space – lakes | 39.2 | 5.30 |
| | Schools | 16.0 | 3.67 |
| | Roads | 46.0 | 0.20 |
| | Infrastructure and utilities | 5.2 | 3.00 |

Land use demand factors do not account for uses of water that occur on a systemwide basis, such as treatment flushing and backwash, mains flushing, fire hydrant use, construction water use, and losses that occur in the distribution system to customers. To account for those uses of water in overall Project demands, the demand

[100] Overestimation of urban water demands in long-term planning studies is common, because the rate of improvements in water use efficiency is uncertain. See Pacific Institute (2020) (finding that urban water management plans for the 10 largest urban water systems in California consistently overestimated future water demand factors from 2000 through 2015).

factor calculations are multiplied by a "non-revenue water" percentage, which is then added to projected end-user demands to generate an overall estimate for water demands. This Supplement follows the WSA in using a non-revenue water requirement of 7.5 percent of demands calculated based on land use factors. This approach is consistent with non-revenue water rates observed in newly constructed developments using modern construction materials and methods.

## 4.2 Project Water Demands

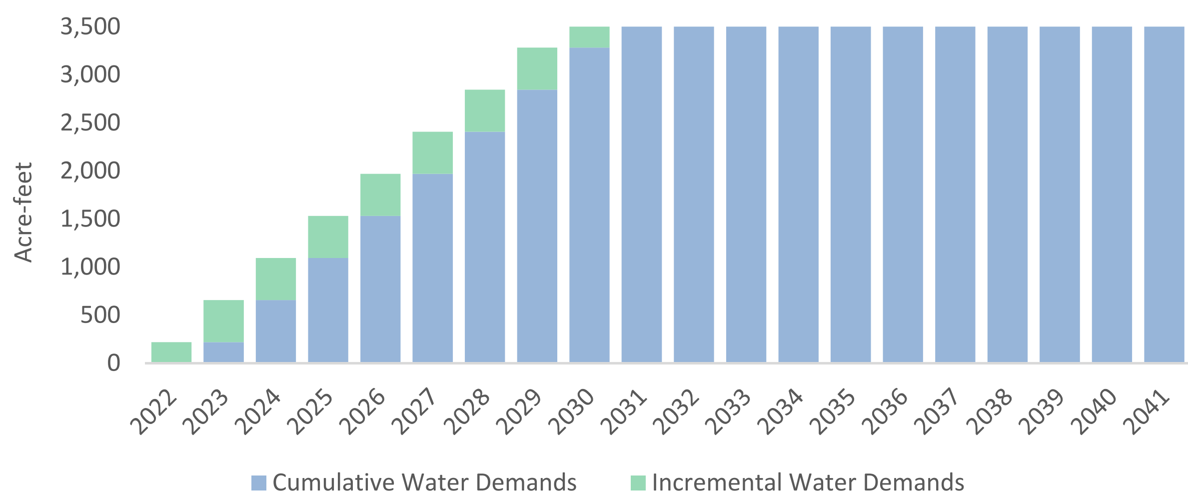
The Project will be divided into three phases, known as Phases 1, 2 and 3. Expected water demands following Phase 1 and combined Phases 2 and 3 are set forth in Table 16. Water demands are calculated from land uses set forth in Table 1 and demand factors in Table 15. Note that the figures in Table 16 are rounded to the nearest 10 AFY for the water demands of each land use category (except where rounding would produce zero demands) and rounded to the nearest 100 AFY for total water demands. Using that approach, this Supplement estimates that total water demands for the Project will be approximately 3,500 AFY. Since this Supplement is focused on water demands and supplies for the Project as a whole, it is that figure which is used hereafter.

**Table 16. Water demands for the Project**

| | | Phase 1 | | Phases 2/3 | | Cumulative After Phases 2/3 | |
|---|---|---|---|---|---|---|---|
| Land Use | Demand Factor (AFY/acre) | Area (acres) | Water Demand (AFY) | Area (acres) | Water Demand (AFY) | Area (acres) | Water Demand (AFY) |
| High density residential | 4.67 | 10.3 | 50 | 11.1 | 50 | 21.4 | 100 |
| Medium density residential | 4.17 | 123.3 | 510 | 237.0 | 990 | 360.3 | 1,500 |
| Low density residential | 3.67 | 106.5 | 390 | 134.4 | 490 | 240.9 | 880 |
| Employment | 3.00 | 26.8 | 80 | 18.0 | 50 | 44.8 | 130 |
| Commercial | 3.00 | 8.9 | 30 | 16.1 | 50 | 25.0 | 80 |
| Parks and recreation | 4.08 | 26.7 | 110 | 32.4 | 130 | 59.1 | 240 |
| Open space – land | 0.60 | 9.2 | 10 | 6.4 | 10 | 15.6 | 10 |
| Open space – lakes | 5.30 | 31.0 | 160 | 8.2 | 40 | 39.2 | 210 |
| Schools | 3.67 | 0.0 | 0 | 16.0 | 60 | 16.0 | 60 |
| Roads | 0.20 | 30.5 | 10 | 15.5 | 10 | 46.0 | 10 |
| Infrastructure and utilities | 3.00 | 5.2 | 20 | 0.0 | 0 | 5.2 | 20 |
| **Subtotal** | | **378.4** | **1,370** | **495.1** | **1,880** | **873.5** | **3,250** |
| Non-revenue water | | | 100 | | 140 | | 240 |
| **Total water demands** | | | **1,500** | | **2,000** | | **3,500** |

Properties in the Project are expected to be sold and occupied between 2022 and 2030, starting with Phase 1 and continuing immediately thereafter into Phases 2 and 3. The pace of construction and occupancy depends on the real estate market and cannot be predicted with accuracy, but for purposes of this Supplement, it is assumed that land sales occur at a constant rate over an eight-year period starting in the middle of 2022. Figure 19 shows the growth in water demands for the Project, starting from zero AFY at the beginning of 2022 and reaching buildout demands of 3,500 AFY in mid-2030. That level of water demands for the Project are then expected to be constant for the remainder of the 20-year planning horizon.

**Figure 19. Projected growth in water demands for the Project**




The timing of future development within Sutter Pointe beyond the Project is unknown at this time, and a supplemental water supply assessment will need to be prepared for each of those phases in turn. Development of future phases will not have any impact on water demands in the Project as evaluated in this Supplement. For purposes of this Supplement, it is assumed that water demands for the entire Sutter Pointe development will be those set forth in the WSA.

## 4.3 Water Use Efficiency

This section addresses the twin concepts of water use efficiency and conservation, as experienced generally in California and the Sacramento region, and as applied to Sutter Pointe and the Project. The discussion begins with policies adopted by the Governor and CPUC, then turns to water efficiency regulations that were adopted during and after the California drought of 2012 through 2016. Those policies and regulations are addressed in this Supplement partly because they were adopted following preparation of the WSA in 2008.

### 4.3.1 20x2020 Water Conservation Plan

In early 2008, Governor Schwarzenegger called for a plan to achieve a 20 percent reduction in per capita water use statewide by 2020.[101] To help develop that plan, the California Department of Water Resources ("DWR") assembled a "20x2020 Team" of state agencies that played a role in the management of California's water, including DWR, the SWRCB, the California Energy Commission, the Department of Public Health, the CPUC and USBR. In its 20x2020 Water Conservation Plan, the team recommended that the state, utilities and water users cooperate to: establish a foundation for a statewide conservation strategy; reduce landscape irrigation demand; reduce water waste through improved water metering and loss reduction; reinforce efficiency codes

[101] Schwarzenegger (2008), p. 2.

and related best management practices; provide financial incentives; implement statewide conservation public information and outreach campaigns; and increase use of recycled and non-traditional sources of water.[102]

In November 2009, the Legislature passed SBX7 7, which required California urban water users to achieve Governor Schwarzenegger's proposed 20 percent reduction by December 31, 2020. SBX7 7 also required urban retail water purveyors to develop interim and ultimate urban water use targets and report on their progress in achieving these targets as part of their UWMPs.

Since the Project will be occupied beginning in 2022, the 20x2020 policy and laws will not apply directly to it. However, the changes in efficiency codes, best management practices and state programs that grew out of the 20x2020 Water Conservation Plan will tend to cause water demands for the Project to be less than those identified in the WSA. Since the Project was originally planned to be constructed with up-to-date water plumbing, fixtures and practices, it is not expected that water demands will be reduced 20 percent from the amount set forth in the WSA. Since quantification of any reduction would be difficult, this Supplement does not change the water demands calculated in the WSA.

### 4.3.2 CPUC Water Action Plan

For several decades, the CPUC has adopted policies encouraging improvements in water use efficiency for the water utilities subject to its jurisdiction, including GSWC. In its Water Action Plan, the CPUC has placed "water conservation at the top of the loading order as the best, lowest-cost supply" and established efficient use of water as one of four "key principles" for its regulation of water utilities.[103] The CPUC has committed itself to strengthening water efficiency measures through education, consumer price signals and utility incentives.[104]

One of the primary ways in which utilities can encourage efficient use of water resources is through their water rates. Pricing water at the full cost to provide service is a recognized method to ensure use of the correct amount of the resource. Numerous water policy experts have adopted full-cost pricing and economic incentives as fundamental principles for water efficiency, as reflected in the example statements below.

> Water use efficiency is a policy goal that can be facilitated by economic incentives.[105]
>
> Utility and system managers as well as regulators and governing boards should ensure that the price of water services fairly charges ratepayers or customers the total cost of meeting service and sustainable water infrastructure requirements, subject to concerns about affordability. Funding for water utilities should generally rely on cost-based rates and charges, and these revenues should not be diverted to unrelated purposes. Full-cost pricing is a sound business practice that is helpful in obtaining debt financing. The resulting price signal to consumers is also good practice from the perspective of promoting wise water use. Where it is necessary to undertake actions to avoid, mitigate and compensate for environmental impacts, these additional out-of-pocket costs should be considered in the full cost of providing service.[106]

[102] California Department of Water Resources (2010), p. xii.
[103] California Public Utilities Commission (2010b), pp. 1-2.
[104] California Public Utilities Commission (2010b), p. 3.
[105] California Department of Water Resources (2009), p. 21-8.
[106] Aspen Institute (2009), p. 28.

> When water is not properly priced, it is frequently wasted. In all urban uses, pricing water at appropriate levels encourages conservation and efficiency actions and investments. All water use and wastewater discharges should be charged at rates (and with rate structures) that encourage efficiency.[107]

It is the intention of GSWC that the principles of economic incentives for efficiency and full-cost pricing be applied to Sutter Pointe to the extent possible. For GSWC, this means setting water service rates based on the cost of providing service, including those actions needed to achieve sustainable management of groundwater and surface water supplies. Unlike government-owned water purveyors in the Sacramento region, GSWC does not collect taxes from its customers, and cannot use tax or similar revenues to reduce its water rates below the cost of providing services. That approach is consistent with the ratemaking process established by the CPUC. Implementation of full-cost pricing will have the additional effect of incentivizing individual residents and businesses of Sutter Pointe to use water efficiently.

### 4.3.3 2012-2016 Drought

#### 4.3.3.1 Overview of the Drought

Following adoption of the WSA in 2009, California experienced a significant drought from 2012 through 2016 (the "Drought"). This section provides a summary of the Drought and analyzes the resulting impacts on urban water use in the Sacramento region. Figure 20 depicts the development of the Drought both chronologically and geographically. The Drought began at the end of 2011 and lasted through the beginning of 2017, a period of five years. By any assessment, the Drought was unusually dry, hot and severe when compared to historical droughts experienced in the state.[108] The period from 2012 through 2015 was the driest consecutive three-year period in California history. It was caused by the occurrence of what became to be called the "Ridiculously Resilient Ridge", an area of high atmospheric pressure that blocked the typical movement of winter storms across the Pacific Ocean toward the West Coast.[109] When combined with higher than average temperatures during winter, the Drought led to snowpack levels in the Sierra Nevada mountains that were only 5 percent of average as of April 1, 2015.[110]

Geographically, the Drought began in the southeastern desert and spread north and west, until it centered on the Sacramento and San Joaquin Valleys in the summer of 2014. By the summer of 2016, its center had shifted southward to the southern San Joaquin Valley and Sierra Nevada mountains. For its entire duration, the Drought affected most of the watershed area for the Sacramento River and its tributaries, which are the source of surface water supplies for much of the state through the federal Central Valley Project and California State Water Project. Reduced precipitation and higher winter temperatures led to low levels of snowpack, which forced those water supply projects to cut their yields to contractors. The annual yields of the projects before, during and after the Drought are shown in Figure 21 and represent one means to measure the intensity of the Drought. Yields were reduced in 2012 and 2013, as water was released from storage in reservoirs. By 2014 and 2015, storage had been depleted, and project yields were at historically low levels. Yields of the Central Valley Project were zero in 2014 and 2015, while yield of the State Water Project fell to 5 percent in 2014. Those yields reflected dry conditions in the Sacramento River watershed generally and directly impacted those water purveyors in the Sacramento region that receive water supplies from the Central Valley Project.

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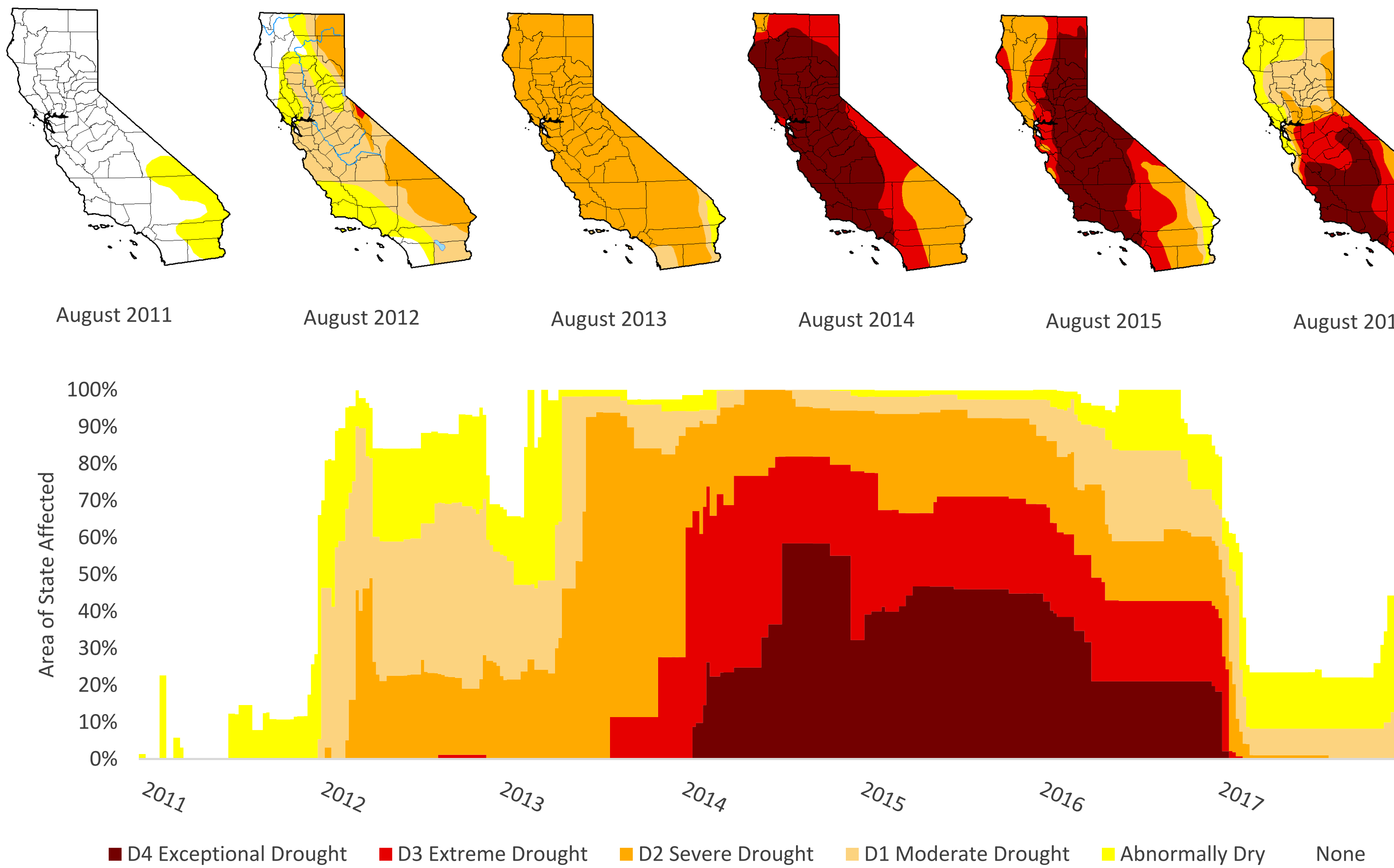
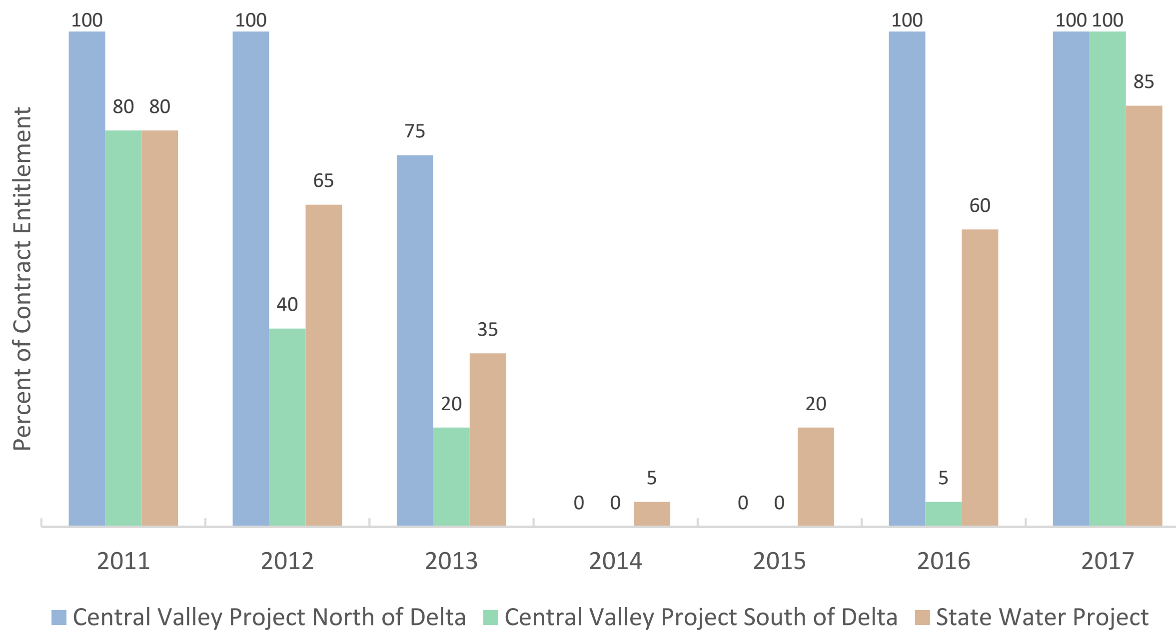
[107] Pacific Institute (2003), p. 14.
[108] Lund, Medellin-Azuara, Durand & Stone (2018).
[109] Swain (2015), p. 9999.
[110] Swain (2015), p. 10,000.

**Figure 20. Extent and severity of the drought in California, 2011-2016**




Source: National Drought Mitigation Center (n.d.).

**Figure 21. California water project yields**




Another way to measure the impact of the Drought on water supplies in the Sacramento region is to examine water right curtailments on the Sacramento River system. During normal hydrologic conditions, all water rights on the Sacramento River may be exercised, but during the Drought the SWRCB issued curtailment notices that cut off diversions by many water purveyors. Specifically, in the summer of 2015, the SWRCB curtailed all diversions of water from the Sacramento River and its tributaries between 1903 and the present, which included 5,992 water rights. The curtailment was lifted on December 10, 2015. In the summer of 2016, the SWRCB issued curtailment notices to 88 water rights that contained permit Term 91, with that restriction lifted on October 14, 2016. Those were the most significant restrictions on diversions ever experienced in the state.

#### 4.3.3.2 Reaction to the Drought in 2014

Governor Brown declared the Drought to constitute a statewide emergency on January 17, 2014 and ordered state agencies to take a number of actions: expedite processing of water transfers; consider petitions requesting consolidation of the places of use of the Central Valley Project and State Water Project, thus streamlining water transfers and exchanges between the two projects; execute a water conservation campaign to encourage personal actions to reduce water usage; and accelerate funding for water supply enhancement projects that could break ground during 2014. The governor also called on water purveyors to implement their water shortage contingency plans and update planning documents, such as UWMPs.[111]

As the 2014 rainy season ended without substantial precipitation, and it became clear that the following summer would be challenging, Governor Brown ordered all California residents to conserve water. Specifically, he instructed residents to refrain from wasting water to clean sidewalks, driveways, parking lots and other hardscapes, in decorative fountains and water features, to wash vehicles other than at carwashes that used recycled water, or to water lawns and landscaping more than two times per week. He directed the SWRCB to adopt emergency regulations for water conservation.[112]

[111] Brown (2014a).

[112] Brown (2014b).

The SWRCB followed the governor's order by developing and adopting an emergency regulation effective July 28, 2014. For water users, the regulation prohibited the following actions consistent with the executive order, with violations potentially resulting in fines up to $500 per day: application of water to driveways and sidewalks; irrigation of outdoor landscapes in a manner that led to runoff onto sidewalks, driveways, parking lots, non-irrigated areas or adjacent properties; use of a hose to wash a motor vehicle without a shut-off nozzle; and use of water in a decorative fountain or water feature without a recirculating system.[113]

The regulation required each water purveyor in the state to implement its water shortage contingency plan at the stage that imposes mandatory restrictions on outdoor irrigation or, if a purveyor did not have a water shortage contingency plan, to restrict outdoor irrigation by its customers to no more than two days per week. A purveyor could submit an alternative plan designed to achieve a comparable level of conservation, including adoption of allocation-based rate schedules.[114] The SWRCB also required all urban water suppliers to report their water usage to the SWRCB on a monthly basis, and to compare that amount to their usage in 2013. For purposes of the regulation, an urban water supplier was defined as a purveyor that supplies water to more than 3,000 service connections or delivers more than 3,000 AFY of water to its customers, in essence meaning all medium- and large-sized water systems.[115]

The SWRCB, DWR and the Association of California Water Agencies launched a statewide public information campaign regarding the Drought and the need for water conservation. In addition, many local media outlets—including television and radio stations and newspapers—publicized the new regulations and other actions that water users could take to reduce usage. Many residents and businesses across California responded by reducing their water consumption significantly, especially by eliminating or reducing outdoor irrigation.

#### 4.3.3.3 Reaction to the Drought in 2015 and 2016

The 2014-2015 rainy season brought limited precipitation, and the Sierra Nevada snowpack on April 1, 2015 was historically low at only 5 percent of normal. On that date, Governor Brown issued an executive order requiring the SWRCB to impose restrictions to achieve a statewide 25 percent reduction in urban water usage when compared to 2013. In addition, the governor required implementation of conservation programs by the CPUC, DWR and California Energy Commission. For DWR, he ordered the agency to update the State Model Water Efficient Landscape Ordinance and lead a statewide initiative to replace 50 million square feet of lawns with drought tolerant landscapes. The CPUC and local water purveyors were required to develop rate structures and other pricing mechanisms to maximize water conservation by their customers.[116]

Effective May 5, 2015, the SWRCB updated its emergency regulations from the prior year. The updated regulations contained the same prohibitions on water uses that had previously been deemed wasteful, and added prohibitions against: application of water to outdoor landscapes during and within 48 hours of measurable rainfall; irrigation of public street medians or landscaping by commercial, industrial and institutional properties more than two days per week; and serving drinking water to customers in restaurants other than upon request.[117]

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[113] California State Water Resources Control Board (2014).

[114] Since rates are set according to the procedure set forth in Proposition 218 for governmental enterprises, or the ratemaking process established by the CPUC for public utilities, it would be impractical for a water purveyor to change its rate structure in response to drought conditions. However, California law does allow a purveyor to set rates based on allocations of basic water use to each customer, regardless of whether a drought or other emergency has occurred. *See* Cal. Water Code §§ 370-374.

[115] Cal. Water Code § 10617.

[116] Brown (2015a).

[117] California State Water Resources Control Board (2015).

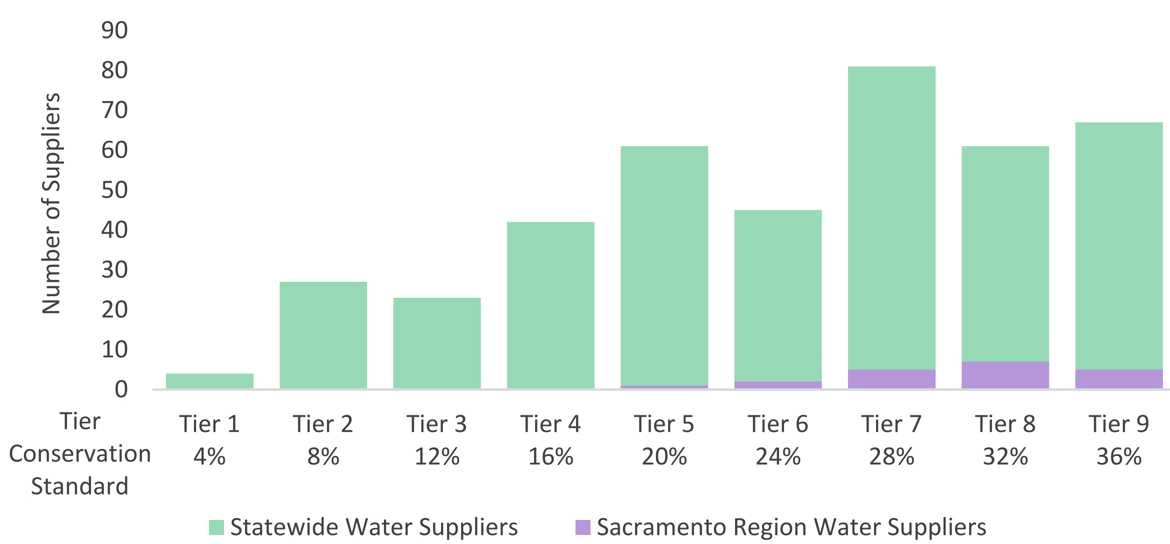
In furtherance of the governor's mandate to reduce statewide urban water use by 25 percent, the new regulations required that each urban water supplier reduce its water production by a percentage assigned by the SWRCB, known as the conservation standard. Reductions were mandated as of June 1, 2015 and compared water use on a monthly basis to that in 2013. Urban water suppliers were divided into nine tiers, with tiers having greater water use during the base period being required to reduce water by a greater percentage. Water use was based on a calculation of residential gallons per capita per day ("R-GPCD"). If an urban water supplier did not meet its conservation standard, the SWRCB was authorized to issue an order directing additional actions to come into compliance.

The distribution of urban water suppliers across the tiers statewide and in the Sacramento region is shown in Figure 22, as well as the conservation standard required of each tier. Urban water suppliers in the Sacramento region were clustered in the upper tiers, reflecting higher R-GPCD in the area. In the Sacramento region, mandatory water conservation measures resulted in significant reductions in urban water use. During 2015 and 2016, the last two years of the drought, water purveyors in the region reported reductions in water use of between 20 and 32 percent compared to 2013, with an average reduction of 27 percent.[118] Those purveyors and their reductions are shown in Figure 23.

In late 2015, Governor Brown ordered the SWRCB to extend its emergency regulations through 2016, if drought conditions persisted through the 2015-2016 rainy season.[119] When the Drought persisted, the governor ordered that the SWRCB extend those regulations into 2017 and develop a permanent program for urban water demand reduction. He also ordered DWR to strengthen the requirements for urban water shortage contingency plans.

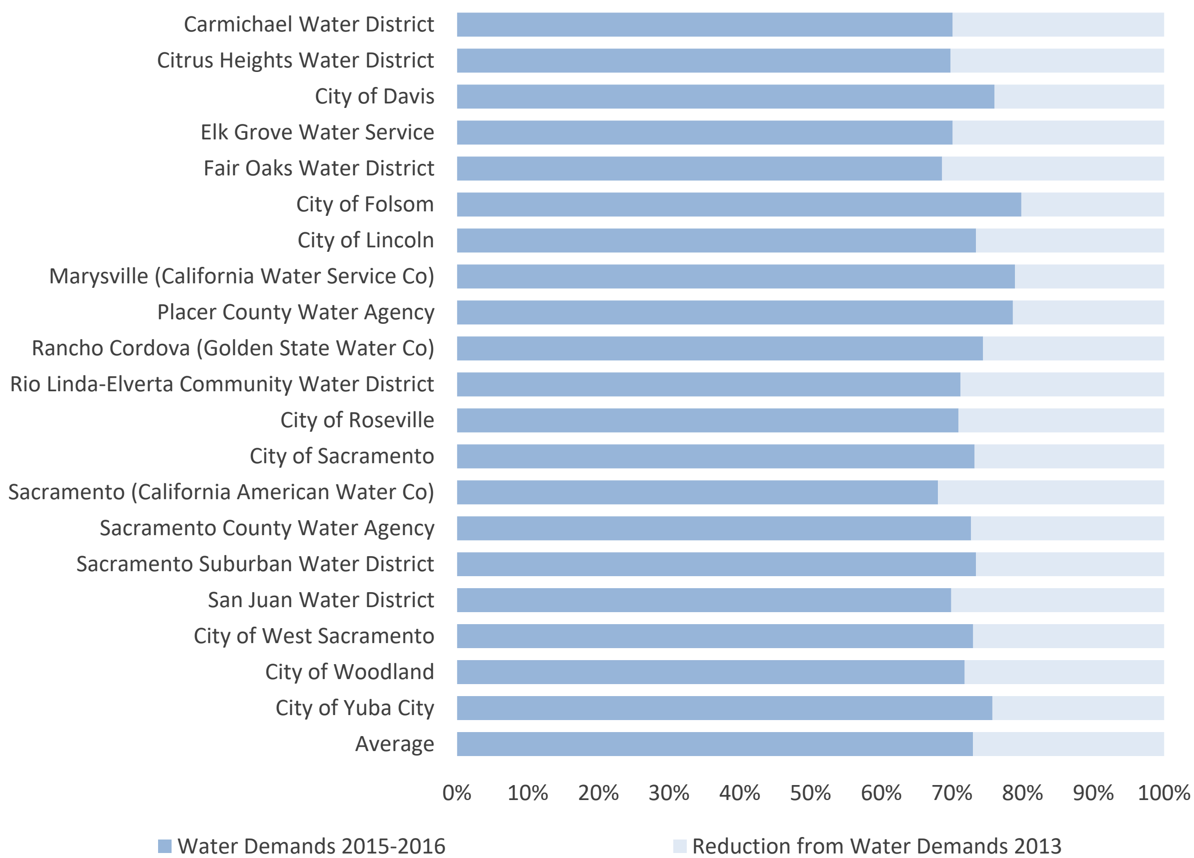
Effective February 11, 2016, the SWRCB amended its emergency regulations to prohibit homeowner associations from enforcing policies that might require irrigation of outdoor landscaping contrary to state water conservation regulations during a drought.[120] On February 8, 2017, the SWRCB expanded that restriction to prohibit a city or county from enforcing a local maintenance ordinance to the same effect.[121]

**Figure 22. Conservation standards in California and the Sacramento Region**




[118] California State Water Resources Control Board (2019).
[119] Brown (2015b).
[120] California State Office of Administrative Law (2016).
[121] California State Water Resources Control Board (2017).

**Figure 23. Water use reduction in multiple dry years for the Sacramento Region**




### 4.3.3.4 End of the Drought

Following extensive precipitation across California in January and February 2017, Governor Brown officially ended the state of emergency related to the Drought on April 7. However, he left in place certain of his previous orders related to water conservation. Importantly, he maintained the mandate that the SWRCB adopt permanent urban water conservation regulations, although he did rescind those portions of the emergency regulations that required a water stress test or mandatory conservation standard for urban water purveyors.

### 4.3.3.5 Post-Drought Implications

Experts have not yet fully analyzed the impact that water use efficiency measures undertaken during the Drought will have on long-term water demands in California. It is likely that some measures led to permanent reductions in demand, such as those derived from installation of more efficient toilets and fixtures, but other changes may have been temporary and already abandoned. That is particularly likely for those measures based on behavioral change.

Some of the efficiency measures that were implemented during the Drought will have limited impact on new developments such as Sutter Pointe, because new developments were already expected to install up-to-date plumbing fixtures and practices. For example, toilet retrofit programs are focused on replacing inefficient toilets in older structures, but have no effect on new construction.

It is our expectation that water use regulations adopted during the Drought will have some downward effect on water demands in Sutter Pointe even during normal water years, but the magnitude of that effect is likely to be substantially less than the savings achieved for pre-existing development. Thus, while water purveyors in the Sacramento region reduced their demands by an average of 27 percent in 2015 and 2016, when compared to 2013, long-term impacts to water demands at Sutter Pointe during normal years are likely to be much less. In order to continue planning using cautious assumptions, this Supplement does not reduce the water demand factors used in the original WSA for normal years. It is likely that the WSA and this Supplement will overestimate water demands for Sutter Pointe in normal years, but that overestimate will not produce any negative outcome, since developments in urban water use efficiency from the Drought—and any future developments—will be applied to Sutter Pointe in the same manner as to other urban areas.

## 4.4 Demand Variance by Hydrologic Conditions

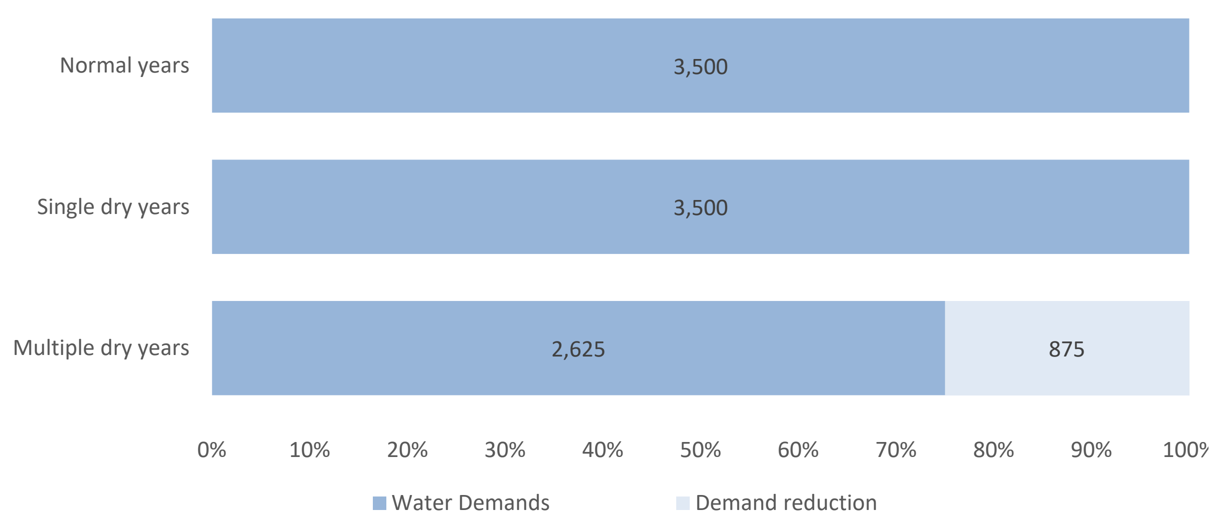
In order to evaluate water supply reliability, SB 610 requires assessment of water supplies and demands in three types of water conditions: normal, single dry and multiple dry water years. There is no statute or regulation that dictates the proper method of calculating demands in single dry and multiple dry water years, and no consistent approach has been developed by water resource professionals within the state.[122] The WSA assumed that water demands would be reduced by 12.5 percent during single and multiple dry years, based on the experience of multiple water purveyors across central and northern California.[123]

During dry periods, without implementation of conservation measures, urban water demands tend to rise based primarily on increased outdoor water use, especially for irrigation of public and private landscaping. Irrigation water demands increase because of lower precipitation and higher temperatures, both of which raise applied water requirements for plants. At the same time, awareness of the need for efficient water use and mandated water conservation programs tend to decrease urban water demands. At the beginning of a dry period, water purveyors and users may not yet fully perceive the need for water conservation, and formal programs are often not implemented until subsequent years of a dry period. In practice, factors that tend to increase and decrease water demands tend to cancel each other out, so that demands remain relatively level during the first year of a dry period. In subsequent dry years, water purveyors and users may be expected to implement conservation measures, either voluntarily or in response to governmental mandate. As described in Section 4.3.3.3, during the Drought from 2012 through 2016, urban water systems in the Sacramento region were slow to react, but ultimately reduced their water use between 20 and 32 percent, with an average of 27 percent.

This Supplement assumes that water demands in a single dry year will be equal to those in normal years, because water conservation measures will not be substantially in effect. However, in multiple dry years GSWC and users in Sutter Pointe can be expected to implement measures resulting in water demands that are lower by approximately 25 percent, based on the experience of the Drought. Projected water demands for the Project are set forth in Figure 24.

[122] *See*, *e.g.*, California Department of Water Resources (2005), Vol. III, p. 3-7 ("Each district has different assumptions and policies that guide their planning").
[123] Tully & Young (2008), pp. 12-14.

**Figure 24. Project water demands in single and multiple dry years**

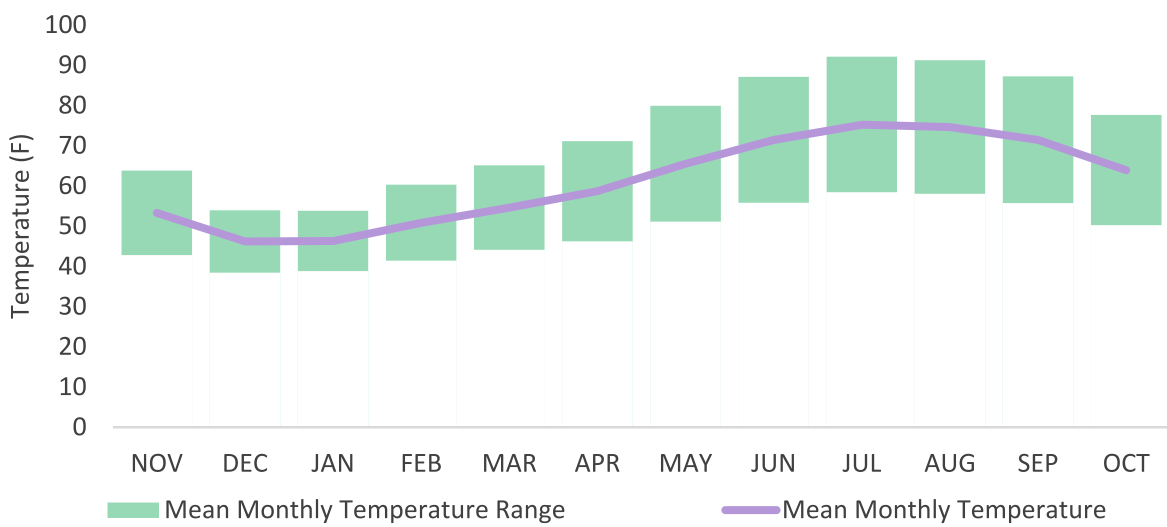



## 4.5 Climate of the Project Area

The Sutter Pointe area experiences cool humid winters and hot dry summers, with average low and high daily temperatures ranging from 38 to 93 degrees Fahrenheit, as shown in Figure 25.

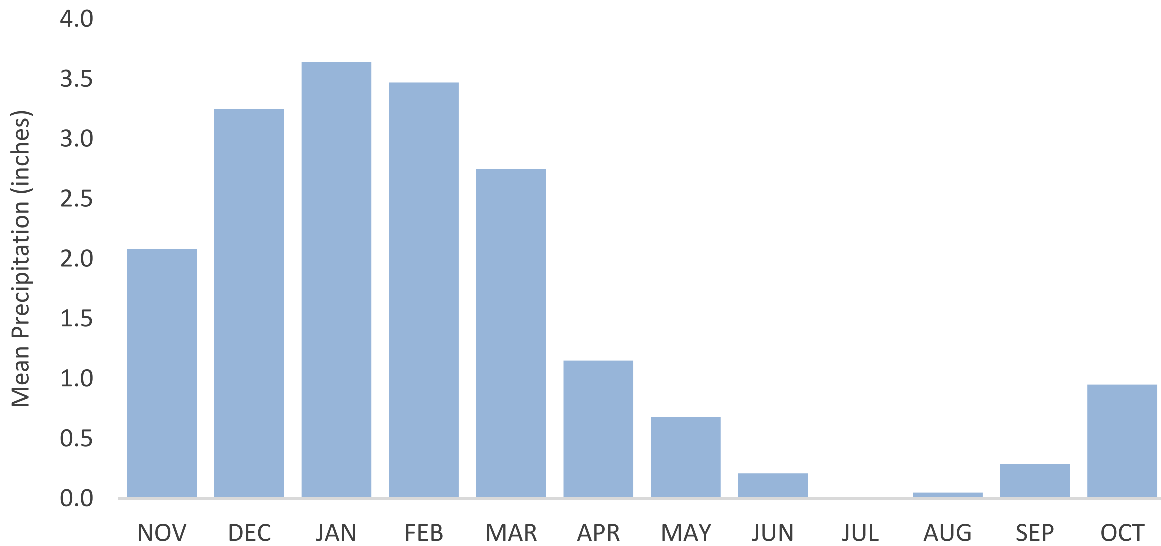
Historical annual precipitation is about 17 inches, with a rainy season lasting from October through April. The amount and distribution of precipitation varies widely from year to year. Mean monthly precipitation is shown in Figure 26; while monthly precipitation during winter months normally averages 2 to 3.5 inches, it can range from zero to 10 inches in any given year. Relative humidity in the area ranges from 29 to 90 percent. The summer months from May through September have generally low humidity, and the combination of hot and dry weather creates high water demands during the summer for both agricultural and municipal uses.

**Figure 25. Temperatures in the Sacramento area**




Source: National Weather Service, Applied Climate Information System, 1981-2010.

**Figure 26. Precipitation in the Sacramento area**




Source: National Weather Service, Applied Climate Information System, 1981-2010.

## 4.6 Use of Recycled Water

Residential and commercial wastewater generated within Sutter Pointe will be transported to and treated by facilities of Sacramento County Regional Sanitation District, which is responsible for management of wastewater across the metropolitan area.[124] The district does not currently plan to return recycled water to Sutter Pointe. However, major open spaces and park areas in Sutter Pointe will be plumbed with purple pipe to facilitate the potential use of recycled water or another source of non-potable water in future.

[124] County of Sutter (2017).

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# Section 5 Groundwater Supplies

This Section 5 of the Supplement describes the groundwater resources that will be used to meet the water demands of the Project, and will be used to meet the ultimate water demands of Sutter Pointe in conjunction with surface water from the Sacramento River. Conclusions regarding the sufficiency and reliability of groundwater are found in Section 0.

## 5.1 The North American Subbasin

According to the boundaries established by DWR, Sutter Pointe overlies the North American Subbasin ("Subbasin") of the Sacramento Valley Basin.[125] The Subbasin is located in the central eastern portion of the Sacramento Valley and contains parts of Sutter, Placer and Sacramento counties. It is bounded on the north by the Bear River, on the west by the Feather and Sacramento Rivers, on the south by the American River and on the east by the edge of alluvial fill in the Sacramento Valley. The Subbasin is shown in Figure 27.

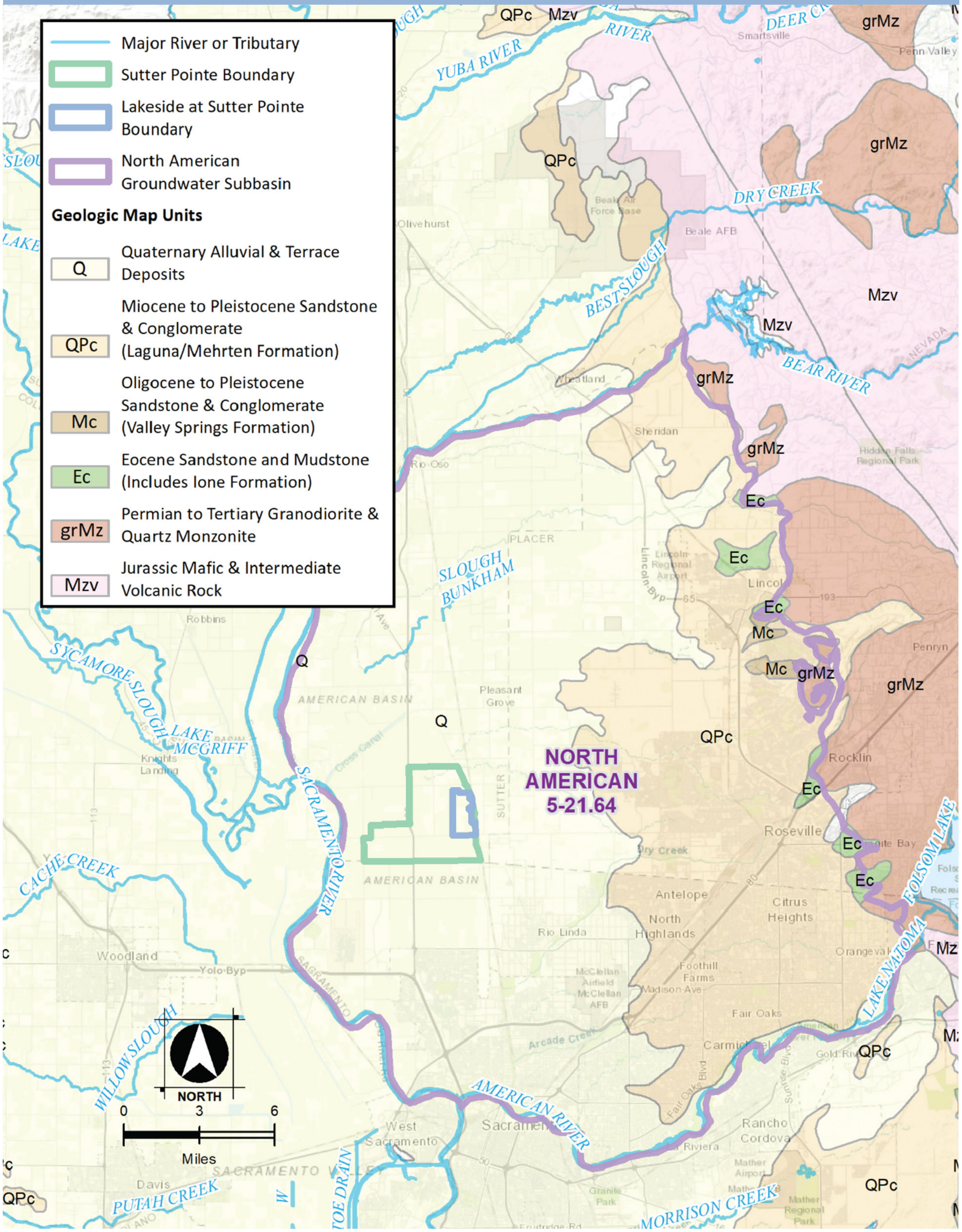
The Sacramento Valley Basin (and the Subbasin within it) consists of alluvial fill materials of various ages that overlie Cretaceous bedrock forming the bed of the valley, the Coast Range to the west and Sierra Nevada to the east. Water-bearing formations in the Sacramento Valley Basin vary from zero feet in depth along the valley edges to 3,500 feet in the south-central part of the valley. In the Subbasin, those formations vary from zero feet on the eastern side of the Subbasin to approximately 2,000 feet along the western edge at the Sacramento River. Alluvial fill materials extend below those depths, but deeper deposits either do not yield material quantities of groundwater or contain brackish groundwater of limited utility.[126] Within the Natomas Basin, the base of fresh groundwater is approximately 1,200 feet below mean sea level near the northeastern edge and drops in a generally southwesterly direction to 2,000 feet below mean sea level near the confluence of the Sacramento and American Rivers.[127]

The Sacramento Valley Basin is filled with unconsolidated deposits of Late Tertiary and Quaternary age, which contain gravel, sand, silt, clay, tuff and conglomerate that were carried and deposited by streams flowing from the Sierra Nevada and Coast Range following uplift of those mountains. Within the Subbasin, the deposits have been grouped and named (from shallowest to deepest) as recent stream channel deposits, flood basin deposits, Victor formation, Laguna formation and Mehrten formation, although in practice the various formations are difficult to distinguish. Below the Mehrten formation lies bedrock, which is generally impervious and does not yield material quantities of groundwater to wells. Each of those formations is described in the subsections below.

The description of the Subbasin contained in this Section 5.1 is taken from the technical reports marked with an asterisk in Section 8. Within this section, citation is made to reports that contain specific information, but much of the discussion is derived from review of the reports generally, without further reference.

[125] California Department of Water Resources (2016), Basin No. 5-021.64, p. 40; California Department of Water Resources (2019).
[126] Berkstresser (1973); Bertholdi, Johnston & Evenson (1991), Figure 8, Figure 16C; Page (1974); Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), p. 24; Williamson, Prudic & Swain (1989), Figure 8.
[127] Berkstresser (1973).

Figure 27. Land surface of the North American Subbasin



### 5.1.1 Recent Stream Channel Deposits

Recent stream channel deposits include sediments deposited in the channels of active streams, as well as overbank deposits of those streams and the abandoned beds of former stream channels. These deposits occur primarily along the Sacramento, American and Feather Rivers along the northern, western and southern edges of the Subbasin, and are still accumulating, or would be under natural conditions. Stream deposits consist primarily of unconsolidated sand, gravel and silt and generally are highly permeable and yield significant quantities of water to wells. Deposits range in thickness from zero to 115 feet. Directly along the path of the rivers, groundwater found in the streambed deposits is in immediate contact with, and is legally classified as part of, surface water in those streams. Surface waters from the Sacramento, American and Feather Rivers are the largest sources of recharge to the Subbasin.[128]

### 5.1.2 Flood Basin Deposits

Flood basin deposits occur along the western edge of the Subbasin adjacent to the Sacramento River and consist of silts and clays. These deposits cover most of the Natomas Basin, reflecting its pre-levee experience as a flood basin, as described in Section 2.2.[129] They may be interbedded with stream channel deposits of the Sacramento River. These deposits range in thickness from zero to 100 feet and are underlain by the Victor formation of the older alluvium. Because of the fine-grained nature of materials, flood basin deposits generally have low permeability and low yields to wells. Water found in these deposits may be brackish. Because of those characteristics, water users generally drill wells in the Natomas Basin into the formations that lie below flood basin deposits.[130]

### 5.1.3 Victor Formation

The Victor formation was named after the town of Victor in San Joaquin County just south of the Mokelumne River, where the formation was first documented. In some literature, including LSCE (2008), it is divided into the Riverbank and Modesto formations. The Victor formation underlies much of the eastern and central areas of the Subbasin, including all of the Natomas Basin and Sutter Pointe. It is shown in Figure 27 as Quaternary Alluvial and Terrace Deposits (Q). In the western area of the Subbasin, the Victor formation underlies recent stream channel and flood basin deposits, while in the central area, the Victor reaches the ground surface, sitting on top of the Laguna Formation. The Victor is generally about 50 feet thick within the Subbasin.[131] The Victor formation includes silt, sand, gravel and clay, with high variability both laterally and vertically, even over short distances. Other than recent stream channel deposits, the Victor formation is the most permeable water-bearing unit within the Subbasin and is the principal source of groundwater for municipal and agricultural uses. Wells that produce groundwater from the Victor have good yields, but normally less than 1,000 GPM due to the limited thickness of the formation.[132]

### 5.1.4 Laguna Formation

The Laguna formation is a layer of sedimentary deposits laid down in the late Miocene and early Pliocene eras, and lies below the Victor formation, except in the eastern portion of the Subbasin, where it reaches the ground surface. In Figure 27, it is shown in combination with the Mehrten Formation as Miocene to Pleistocene Sandstone and Conglomerate (QPc). It generally forms a wedge shape, thinning near the Sierra Nevada and

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[128] Olmstead & Davis (1961), pp. 107-114.
[129] Page (1986), Plate 1.
[130] Olmstead & Davis (1961), pp. 114-117, 205-206.
[131] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 25-26; Olmstead & Davis (1961), p. 93, *citing* Piper, Gale, Thomas & Robinson (1939); Page (1986), Plate 1.
[132] Olmstead & Davis (1961), pp. 93-101

thickening toward the center of the Sacramento Valley to as much as 1,000 feet. Within the Subbasin, its thickness is probably less than 200 feet. It includes silt, clay, sand and gravel, which vary both laterally and vertically, and has low permeability due to fine grains and cementation. The Laguna generally yields low to moderate volumes of water, although there are locations where wells produce groundwater at over 1,000 GPM for municipal or agricultural use. Likewise, in most areas the Laguna does not allow significant percolation of precipitation or applied water.[133]

### 5.1.5 Mehrten Formation

Below the Laguna formation is a sequence of volcanic rocks known as the Mehrten formation. This unit is exposed to the ground surface along the eastern edge of the Subbasin between the cities of Lincoln and Folsom. It is composed of black sands, stream gravels, silt and clay interbedded with dense tuff breccia. The Mehrten formation is between 200 and 500 feet thick across much of the Subbasin and extends vertically from the bottom of the Laguna formation to the base of fresh groundwater. Based on data from monitoring wells, the Mehrten formation is at least 900 feet thick near the Sacramento International Airport on the western side of the Natomas basin.

Sand and gravel intervals within the Mehrten formation are highly permeable and yield over 1,000 GPM to wells. The tuff breccia intervals are of low permeability and generally act as confining layers. The Mehrten is a significant source of groundwater to users within the Sacramento Valley Basin. In LSCE (2008), the Mehrten formation was referred to as the lower aquifer, and the more shallow Victor and Laguna formations were referred to collectively as the upper aquifer system.[134]

### 5.1.6 Test Wells

In preparation for Sutter Pointe, developers have drilled and tested two sets of wells. First, LSCE installed multiple-completion monitoring and production well in the southwestern portion of Sutter Pointe in 2007, in order to determine groundwater quality at different depths and conduct a 36-hour aquifer pumping test. Those tests found that the well could reliably produce about 2,000 GPM on a long-term basis with acceptable water quality.[135]

More recently, Wood Rodgers, Inc. installed monitoring wells at two sites in the Project area in July 2019. At the northern site, Wood Rodgers determined that the exploratory well could produce groundwater in excess of 2,000 GPM on a long-term basis, but the well would also produce significant quantities of methane. While treatment is available for methane, it would be better to locate wells at the southern site where methane was not detected. At the southern site, Wood Rodgers found that the exploratory well could produce more than 2,000 GPM, and groundwater samples met all quality requirements for drinking water other than for arsenic and manganese. Design of groundwater wells for the Project will include both shallow and deep wells at the southern site, plus well-head treatment for both arsenic and manganese.[136]

## 5.2 Models of the Subbasin

The Subbasin has been the subject of several conceptual and numerical models. The first comprehensive reports on geology and groundwater of the Sacramento Valley Basin (including the Subbasin) were Bryan (1923) and California Department of Public Works, Division of Water Resources (1931), but neither of those reports provided any numerical analysis of the Sacramento Valley Basin or Subbasin.

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[133] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), p. 25; Olmstead & Davis (1961), pp. 82-88.
[134] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 24-27.
[135] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 27-30; Tully & Young (2008), pp. 46-47.
[136] Wood Rodgers, Inc. (2019a, 2019b).

The first study to estimate groundwater in storage within the Sacramento Valley Basin, with a separate estimate for the Subbasin, was Olmstead & Davis (1961). That study divided the Subbasin into three "storage units"—flood basin south of the Bear River (B3), flood basin east of the Feather and Sacramento Rivers (D2) and remainder of the Subbasin, roughly the area underlain by the Victor, Laguna and Mehrten formation outcrops (C4)—and calculated the quantity of groundwater in storage in the top 200 feet below ground surface as approximately 2.85 million AF. As discussed in Section 5.1, water-bearing formations in the Subbasin extend much deeper than 200 feet, thus that figure is substantially less than total groundwater in storage within the Subbasin. For the entire Sacramento Valley Basin, the study estimated storage of approximately 28 million AF in the top 200 feet below ground surface.

In the early 1970s, DWR created a numerical model of groundwater within Sacramento County, including a portion of the Subbasin, in order to simulate the impacts of groundwater production.[137] DWR also created a model of natural flows conditions for the whole Sacramento Valley Basin in 1978, but that model was neither calibrated nor verified.[138]

Between 1978 and 1984, a team of scientists at USGS studied the geology and groundwater of the Central Valley as a whole, producing conceptual and numerical models as part of the program known as Central Valley Regional Aquifer-System Analysis ("CV-RASA").[139] As part of that effort, USGS surveyed fine- and coarse-grained deposits within the Subbasin and found the depth of water-bearing formations to be between zero and 2,000 feet, with coarse-grained materials generally comprising between 40 and 80 percent of deposits.[140] A finite-difference numerical model was calibrated using data from 1961 through 1977, because that period had the most complete data available. The model estimated total groundwater in storage within the top 1,000 feet of the Sacramento Valley Basin to be 170 million AF as of 1961, with no separate calculation for the Subbasin.[141] The CV-RASA model represented groundwater conditions for large regions, but was inadequate at scales less than about 500 square miles.[142]

During the 1990s, Montgomery Watson, Inc. developed an Integrated Groundwater Surface Water Model ("IGSM") for the Subbasin, in order to support the Water Forum discussed in Section 5.4.2. The portion of the Subbasin within Sacramento County was modeled in 1993 as the Sacramento County IGSM ("SACIGSM"), and the portion within Sutter and Placer Counties was modeled in 1995 as the North American River IGSM ("NARIGSM"). The IGSMs were originally calibrated using hydrologic data from October 1969 through September 1995 and have been updated with additional data in 1997, 2001 and 2007. The models were used by LSCE to evaluate groundwater available for Sutter Pointe, and that analysis was included in the WSA published in 2008.[143] The NARIGSM and SACIGSM were also used by WRIME in 2005 to prepare NCMWC's Integrated Water Resources Management Plan.[144]

In the 2000s, DWR developed its own numerical model of the Sacramento Valley Basin, based on the IGSM and called the California Central Valley Groundwater-Surface Water Simulation Model ("C2VSim"). That model uses both a coarse grid originally developed in 1989 and a fine grid developed in 2011, with a simulation period from October 1921 through September 2009. A subarea of the C2VSim model that focuses on the North

[137] California Department of Water Resources (1974).
[138] California Department of Water Resources (1978).
[139] The effort was reported in Bertholdi, Johnston & Evenson (1991), Page (1986) and Williamson, Prudic & Swain (1989), and construction of the numerical model was specifically described in Williamson, Prudic & Swain (1989), pp. D13-D40.
[140] Page (1986), Figures 6-10; Williamson, Prudic & Swain (1989), Figure 8.
[141] Bertholdi, Johnston & Evenson (1991), p. A22; Williamson, Prudic & Swain (1989), p. D44, .
[142] Faunt (2009), p. 7.
[143] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 43-51; Tully & Young (2008), pp. 56-64.
[144] NCMWC (2006), pp. 49-51; WRIME (2005), p. 1.

American, South American and Cosumnes Subbasins has been developed as the Sacramento Valley Simulation Model ("SacSim"), and both the C2VSim and SacSim models are currently being refined by DWR for use with the Sustainable Groundwater Management Act discussed in Section 5.4.3. That modelling work is being performed by Woodard & Curran Inc. and is expected to be completed in late 2020 or early 2021.[145] C2VSim is capable of producing regional and subregional water budgets and simulating the effects of long-term management strategies and climate change on the Central Valley's hydrologic system.[146] The Subbasin makes up Subregion 7 within the Sacramento Valley Region of the model, and C2VSim can analyze changes in groundwater at the level of the Subbasin as a whole.

During the 2000s, USGS created another numerical model of the Central Valley, known as the Central Valley Hydrologic Model ("CVHM"). The model combined a geographic information system ("GIS") for processing multiple sources of data, such as satellite-derived land uses and topography, with the MODFLOW-2000 modeling software and various add-on packages.[147] The model was originally calibrated using the historical period from 1962 through 2003 and later extended through 2014.[148] The model was developed at scales relevant to water management decisions for the entire Central Valley aquifer system.[149]

## 5.3 Groundwater Recharge and Elevation

Groundwater in the Subbasin is naturally recharged from the surface flow of streams, such as the Sacramento, American and Bear Rivers and their tributaries, and to a more limited extent from precipitation. In addition, the Subbasin is artificially recharged in certain areas through percolation of irrigation water applied to the land surface, most of which is derived from surface water diverted from the above-named streams. Groundwater flows in the Subbasin are generally from east to west toward the center of the Sacramento Valley and the Sacramento River, but are very slow due to flatness of the geology. In the Sutter County portion of the Subbasin, groundwater flows southward and eastward from the Feather and Sacramento Rivers toward the American River and a pumping depression located near former McClellan Air Force Base.[150]

Groundwater levels generally fall during the dry months from April through December, when precipitation and thus recharge is uncommon, and rise during the wet season from January through March. This seasonal rise and fall is typically of approximately 10 feet in the Subbasin, but will be greater during periods of lower precipitation.[151] Extraction of groundwater by wells will cause greater seasonal depression, but lowered groundwater levels during a dry season also make more space available for recharge during the following wet season.

Groundwater levels in the Natomas Basin have been consistently high and stable since before agricultural development, based on proximity to the Sacramento and American Rivers and use of surface water for irrigation in Natomas Basin. Within the Natomas Basin, groundwater levels during the early development years were so high that springs would develop in the bottom of drainage canals.[152] As of 1971, groundwater levels in the Natomas Basin were holding steady between 10 and 20 feet below ground surface.[153] In 1977, a study

[145] Brush, Dogrul & Kadir (2013); California Department of Water Resources (n.d.-b).
[146] Brush, Dogrul & Kadir (2013), at pp. 16, 149-174, 182-184.
[147] Faunt (2009), pp. 1-3.
[148] Faunt, Sneed, Traum & Brandt (2015), p. 677.
[149] Faunt (2009), p. 3; Faunt, Sneed, Traum & Brandt (2015), p. 677.
[150] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), p. 35; Williamson, Prudic & Swain (1989), p. D14; Bryan (1923), p. 172.
[151] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 31-33.
[152] Castaneda, Docken, Pitti & Ide (1984), p. 288.
[153] Fogelman (1979), Figure 4.

found seven wells used to supply irrigation water within the Sutter County portion of the Natomas Basin, and groundwater elevations in those wells ranged from 10 to 30 feet below ground surface.[154]

LSCE (2008) surveyed and created hydrographs for 79 wells in the Natomas Basin. Groundwater levels in those wells remained relatively high throughout the historical period. Two wells located within Sutter Pointe with a long historical record (Wells 10N/04E-02K1 and 11N/04E-34N01) experienced declines in groundwater levels from the 1950s through the late 1970s, then recovered through 2007, but levels were never below 38 feet below ground surface. Representative hydrographs in the vicinity of Sutter Pointe are shown in Figure 28.[155]

Groundwater levels have generally been high across the Subbasin as a whole.[156] As of 1913, groundwater elevations were less than 25 feet below ground surface across much of the Subbasin,[157] and in the fall of 1929, depth to groundwater in the Subbasin was measured between 10 and 22 feet below ground surface.[158] One study found that between the predevelopment period and 1961, groundwater levels did not change materially in any area of the Subbasin.[159] From 1961 to 1976, groundwater elevations rose between 20 and 40 feet across much of the northern portion of the Subbasin, based on extensive use of irrigation water from surface sources, primarily the Sacramento and American Rivers. While subsidence has been a problem in other areas of the Central Valley, no significant subsidence has occurred within the Subbasin based on pumping of groundwater or otherwise.[160] Groundwater elevations in the Subbasin ranged from zero to approximately 120 feet above mean sea level in the period before development, with higher elevations along the eastern edge of the Subbasin and lower elevations along the western edge. As of 1976, those elevations ranged from zero to 80 feet.[161]

Despite generally high groundwater levels in the Subbasin, groundwater levels have fallen in specific locations. By the middle 1970s, groundwater pumping depressions existed in the vicinity of the former McClellan Air Force Base and southwestern Placer County, as seen in Figure 29 and Figure 30. However, neither of those depressions has affected groundwater elevations in the Natomas Basin where Sutter Pointe will be located.[162]

In preparation for this Supplement, Wood Rodgers produced Figure 29 and Figure 30, which show groundwater elevations for the spring and fall of 2018 in the western portion of the Subbasin, including the Natomas Basin and Project. Those hydrographs are important, because they show historical groundwater elevations during the Drought that occurred following the WSA and analysis by LSCE. The hydrographs show that groundwater levels fell between 30 and 40 feet in most wells by end of the Drought in 2016, but had mostly recovered to pre-Drought conditions by the fall of 2018, less than two years after end of the Drought. Given the thickness of water-bearing formations in the Natomas Basin of approximately 1,200 feet, drawdown of groundwater levels by 30 to 40 feet during one of the most significant droughts in state history is reasonable, and demonstrates the long-term reliability of groundwater underlying Sutter Pointe.

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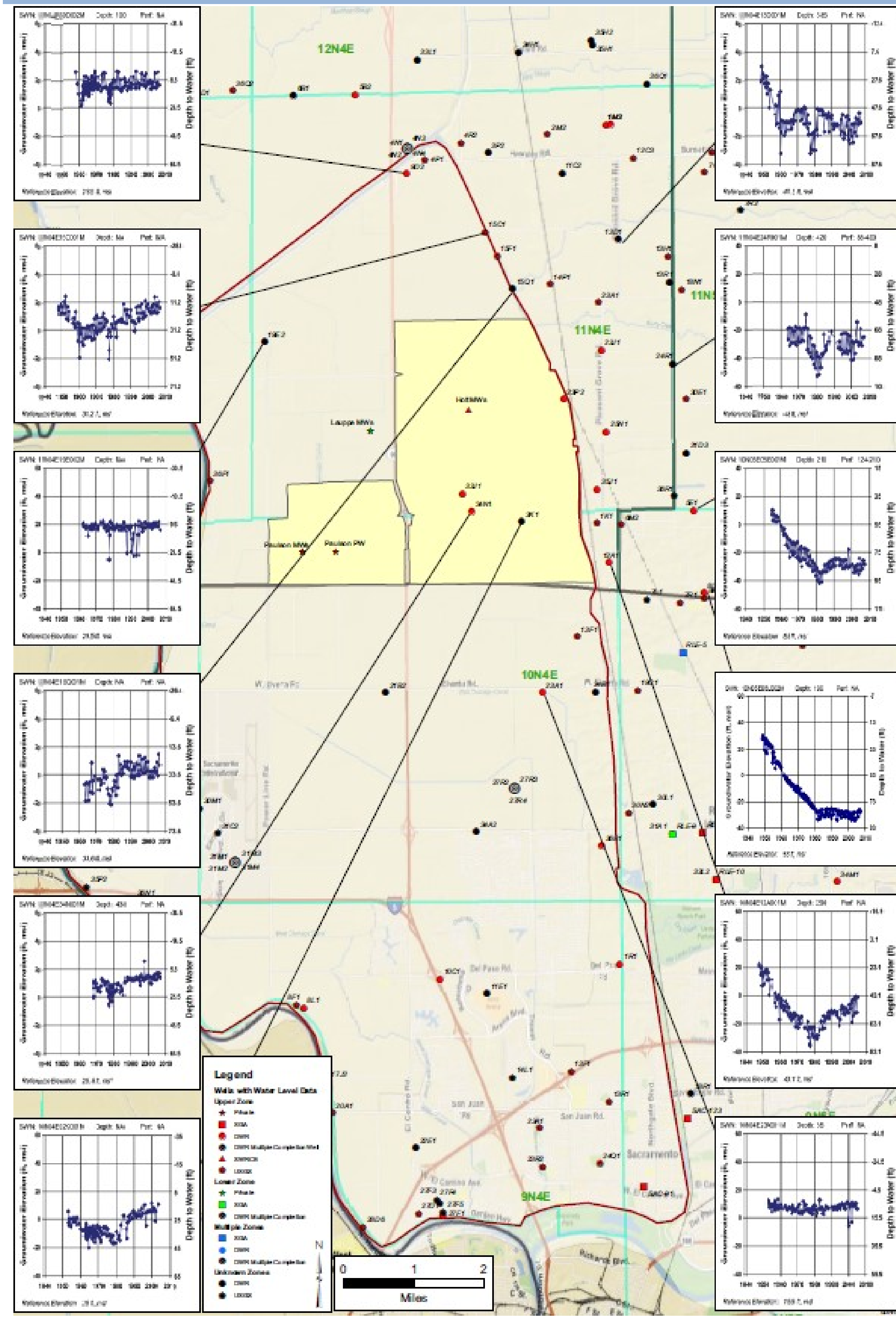
[154] Fogelman & Rockwell (1977), pp. 4-5, 80-81.
[155] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 31-33.
[156] A recent study found that the estimated lifespan of water stored in the Central Valley is 390 years. However, the rate of depletion varies across the valley, with higher levels of depletion in the Tulare Basin in the southern end of the Central Valley and little or no depletion in the Sacramento Valley. Scanlon, Faunt, Longuevergne, Reedy, Alley, McGuire & McMahon (2012), p. 9324.
[157] Bryan (1916), Plate II.
[158] California Department of Public Works, Division of Water Resources (1931), p. 526, Plate F-II.
[159] Bertholdi, Johnston & Evenson (1991), at Figure 18.
[160] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 39-40; Williamson, Prudic & Swain (1989), Figures 32A, 33B, 38A.
[161] Bertholdi, Johnston & Evenson (1991), Figures 11 and 13.
[162] Bertholdi (1979), Figure 3; Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 31-32, 34-37.

**Figure 28. Representative water level hydrographs near Sutter Pointe**



Source: Reprinted from Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), Figure 4-2.

**Figure 29. Spring 2018 groundwater elevation contours for the western Subbasin**

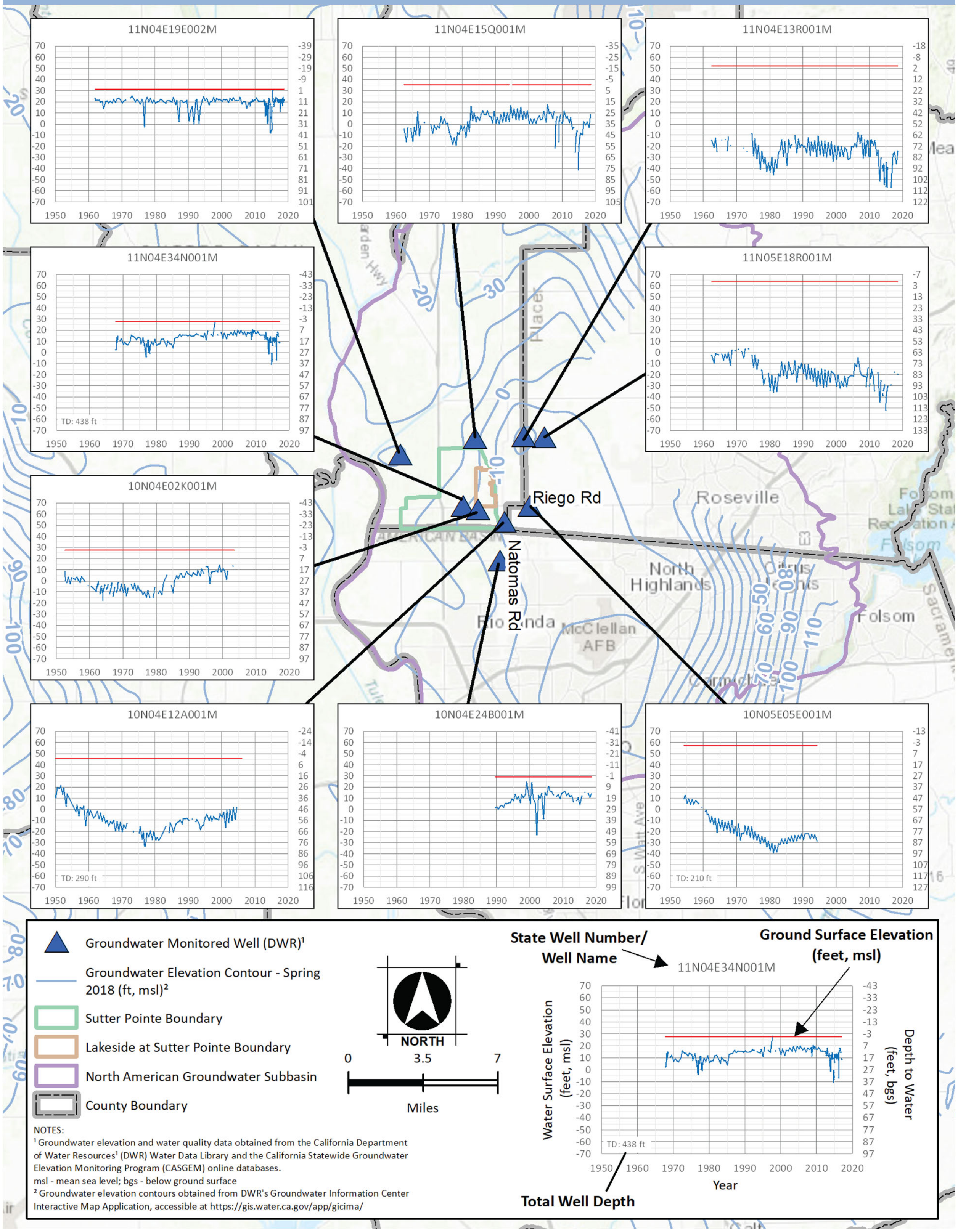
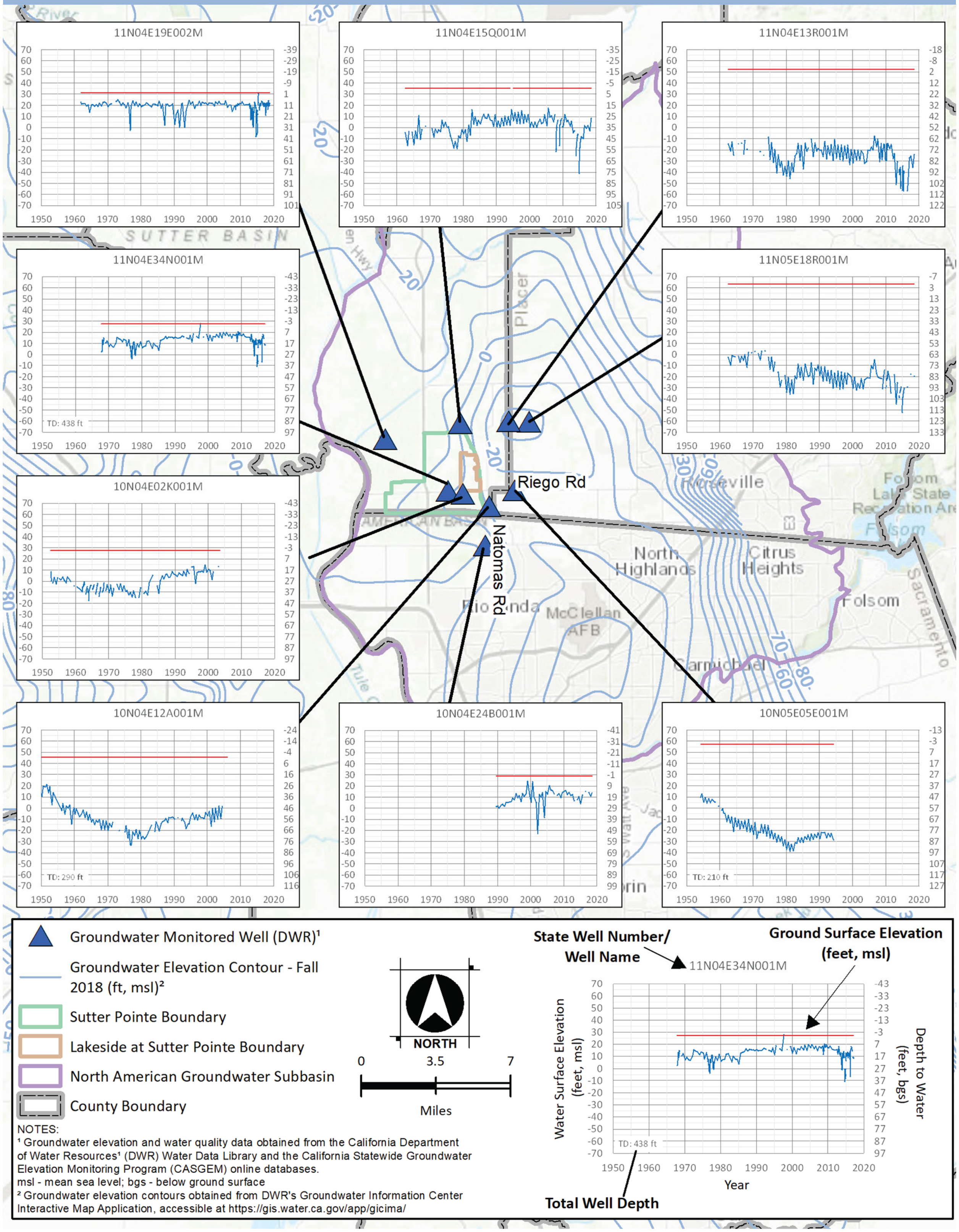


**Figure 30. Fall 2018 groundwater elevation contours for the western Subbasin**



According to DWR, the Subbasin has not been and is not subject to critical conditions of overdraft.[163] The same is true of groundwater in the Natomas Basin.[164] DWR did find in a 1998 study that overdraft existed in the vicinity of McClellan Air Force Base in the Sacramento County portion of the Subbasin, but groundwater declines in that location have abated since the 1990s.[165] As discussed in Section 0, management of the Subbasin is expected to prevent any further overdraft from occurring.

## 5.4 Management of the Subbasin

### 5.4.1 Groundwater Rights

Historical use of groundwater by individual landowners in the Natomas Basin has been pursuant to their respective overlying rights. Overlying rights allow a landowner to produce groundwater from below their property for reasonable and beneficial uses, including agriculture.[166] Because overlying rights can only be exercised by the owner of the land on which the water is used,[167] GSWC will not utilize overlying rights to produce groundwater for delivery to its customers in Sutter Pointe. GSWC will establish appropriative rights to groundwater in the Subbasin pursuant to state law. That law recognizes an appropriative right to groundwater for a person that produces groundwater and places it to reasonable and beneficial use, which may include domestic, municipal and industrial uses.[168]

In the event of a general lowering of groundwater levels in an area, the holder of appropriative or overlying rights may initiate an adjudication to determine the rights of all producers of groundwater from the source. Groundwater rights in the Natomas Basin have not been adjudicated as part of the Subbasin or larger Sacramento Valley Basin.[169]

In preparation for the provision of water services to Sutter Pointe, the developers have agreed to place deed restrictions on the extraction and use of groundwater by individual landowners, in favor of GSWC. The developers will enter into a "Groundwater Forbearance and Estoppel Agreement" covering all lands to be developed before their subdivision. The agreement will provide that landowners may not produce groundwater from below their properties or take any other action that would interfere with the ability of GSWC to produce groundwater for the common benefit of the Sutter Pointe lands. Landowners will grant a priority interest in groundwater to GSWC, and agree not to purchase or use any groundwater on their properties other than that received from GSWC. Those restrictions will run against the Sutter Pointe lands, be effective in perpetuity and be enforceable by GSWC.[170]

### 5.4.2 Regional Management

Groundwater in the Subbasin has been actively managed as part of several regional efforts beginning in the 1990s. Regional planning officially began in 1993, when the City and County of Sacramento initiated an effort known as the Water Forum to address decreased flows in the lower American River. Ultimately, 40 different water agencies, utilities and environmental groups signed the Water Forum Agreement on April 24, 2000. That agreement led to discussions regarding the long-term conjunctive use of surface water and groundwater

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[163] California Department of Water Resources (2006, 2016). *See* Cal. Water Code §§ 10910(f)(2)(C)(i), 12924.

[164] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 37-38.

[165] California Department of Water Resources (1998). See discussion in Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), p. 37; Tully & Young (2008), pp. 49-50.

[166] *City of Barstow v. Mojave Water Agency*, 23 Cal.4th 1224, 1251 (2000).

[167] *Id.* at 1240.

[168] *City of Los Angeles v. City of San Fernando*, 14 Cal.3d 199, 282 (1975); *City of Pasadena v. City of Alhambra*, 33 Cal.2d 908, 933-934 (1949).

[169] *See* Cal. Water Code § 10910(2)

[170] Settlement Agreement (2011), Exh. C.

supplies across the Sacramento metropolitan region, as surface water-dependent agencies sought access to groundwater during dry years, and groundwater-dependent agencies sought access to surface water during wet years to alleviate localized depressions, such as in the vicinity of McClellan Air Force Base. The Water Forum led to the various efforts summarized below.

In 1998, water purveyors in the Subbasin within Sacramento and Placer Counties formed the American River Basin Cooperating Agencies ("ARBCA") to implement the regional conjunctive management program developed by the Water Forum. The agencies published a Regional Water Master Plan in 2002. One program of that plan was a Groundwater Stabilization Project, which would provide up to 29,000 AFY of surface water from the American River to an area in western Placer County that historically relied upon groundwater. As a consequence, groundwater levels in that area of the Subbasin had declined, and the project would allow those levels to recover by using surface water in lieu of groundwater to meet local demands. The surface water to be used is delivered to Placer County Water Agency ("PCWA") through facilities owned by Sacramento Suburban Water District, using water from PCWA's Middle Fork Project on the Middle Fork American River.[171]

Also in 1998, Sacramento County and the cities of Sacramento, Folsom and Citrus Heights formed the Sacramento Groundwater Authority ("SGA") as a joint powers authority to manage the Sacramento County portion of the Subbasin. After execution of the Water Forum Agreement in 2000, SGA assumed responsibility for implementing actions related to groundwater in Sacramento County. SGA adopted a Groundwater Management Plan for the portion of the Subbasin within Sacramento County in December 2003. The plan included five basin management objectives, to be achieved through corresponding actions: maintain or improve groundwater quality; maintain or improve groundwater levels that result in a net benefit to basin groundwater users; protect against inelastic (permanent) land subsidence; avoid adverse impacts to surface flows in the Sacramento and American Rivers; and protect against adverse impacts to water quality based on the interaction of surface water and groundwater.[172] SGA has been actively managing groundwater quantity and quality since its establishment and continues to do so today.

NCMWC prepared a Groundwater Management Plan in 2002, although the plan was never officially adopted by the company's board of directors. The draft plan described the current use of groundwater, surface water and recycled agricultural tailwater within the company boundaries and recommended 10 actions to be taken by the company related to groundwater: monitoring of groundwater levels and quality; monitoring of surface water flows and quality; development of additional groundwater and conjunctive use with surface water; avoidance of overdraft; avoidance of groundwater quality degradation; development and continuation of relationships with federal, state and local agencies; continuation of public education and water conservation programs; well construction, abandonment and destruction policies; management and protection of groundwater recharge areas; and the ability to take further actions as needed to respond to changing conditions.[173]

Water agencies in the Sacramento region formed the Regional Water Authority ("RWA") in 2001 to implement other programs proposed by the Water Forum, but not assumed by SGA or ARBCA. RWA prepared an American River Basin Integrated Regional Water Management Plan in May 2006, with subsequent updates in 2013 and 2018. That plan covers all of Sacramento County and the western portions of Placer and El Dorado Counties and includes a number of implementation projects. Projects concerning groundwater in the Subbasin are generally led by SGA or specific water purveyors that use groundwater.[174]

[171] United States Bureau of Reclamation & Placer County Water Agency (2005).
[172] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), p. 8.
[173] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 6-7.
[174] Regional Water Authority (2018, n.d.).

In 2006, the Northern California Water Association adopted the Sacramento Valley Integrated Regional Water Management Plan, which covered much of the Sacramento Valley from Redding to Sacramento and parts of 10 counties. The plan served as an umbrella for subregional efforts but was not coordinated with the Water Forum or other efforts in the Subbasin. It adopted 12 strategies to further five management objectives to: improve the economic health of the region; improve regional water supply reliability; improve and enhance water quality; protect and enhance the ecosystem; and improve flood protection. The Sutter Pointe area was included in Detailed Analysis Unit (DAU) 172, but no specific strategies were adopted for implementation in that unit, to a large extent because groundwater levels have remained stable in that area.[175]

The cities of Roseville and Lincoln, PCWA and California American Water Company jointly developed a groundwater management plan for the portion of the Subbasin located in Placer County in 2007. The plan was prepared by the consulting firm MWH Global, Inc. and contained five basin management objectives: no significant adverse effect on groundwater quality; manage groundwater levels to ensure adequate groundwater supplies without adversely affecting adjacent areas; participate in federal and state subsidence monitoring programs; protect against adverse impacts to surface water flows from groundwater pumping; and ensure groundwater recharge projects comply with federal and state regulations and protect beneficial uses of groundwater.[176]

Collectively, regional planning and projects have succeeded in stabilizing groundwater levels in those areas where they were previously falling. For example, the groundwater depressions near McClellan Air Force Base and in western Placer County have stopped declining and recovered to some extent. It is anticipated that these regional efforts will continue to improve groundwater conditions across the Subbasin, which will protect groundwater in the Natomas Basin for future use by the Project and Sutter Pointe.

### 5.4.3 Sustainable Groundwater Management Act

In 2014, the California Legislature adopted the Sustainable Groundwater Management Act ("SGMA"), which mandated sustainable management of all groundwater basins across the state for the first time.[177] As discussed in Section 5.4.2, water agencies and utilities in the Subbasin had been actively engaged in such management since the 1990s, so in many respects passage of SGMA did not effect a significant change for the Subbasin.

DWR is required to assign each groundwater basin in the state a priority level from very low to high, and management under SGMA depends on the priority assigned. The Subbasin (DWR Basin No. 5-21.64) has been assigned high priority, as shown in Figure 31. Note that although the Subbasin is classified as high priority, it is not considered to be critically overdrafted. Almost all subbasins of the Central Valley are high priority, and almost all subbasins in the San Joaquin Valley and Tulare Lake Basin portions suffer from critical overdraft, while the Sacramento Valley is largely free from that condition. SGMA required that all areas of each groundwater basin be under the management of a groundwater sustainability agency ("GSA") by June 30, 2017. Five agencies volunteered for that responsibility and each was recognized by DWR as the exclusive GSA for a portion of the Subbasin:

- SGA for the area within Sacramento County, including the southern part of the Natomas Basin;
- West Placer Groundwater Sustainability Agency for the area within Placer County;
- South Sutter Water District for the area of Sutter County within the boundaries of that district;
- Reclamation District No. 1001 for the area of Sutter County within the boundaries of that district; and
- County of Sutter for the remaining area of Sutter County, including the northern part of the Natomas Basin and all of Sutter Pointe.

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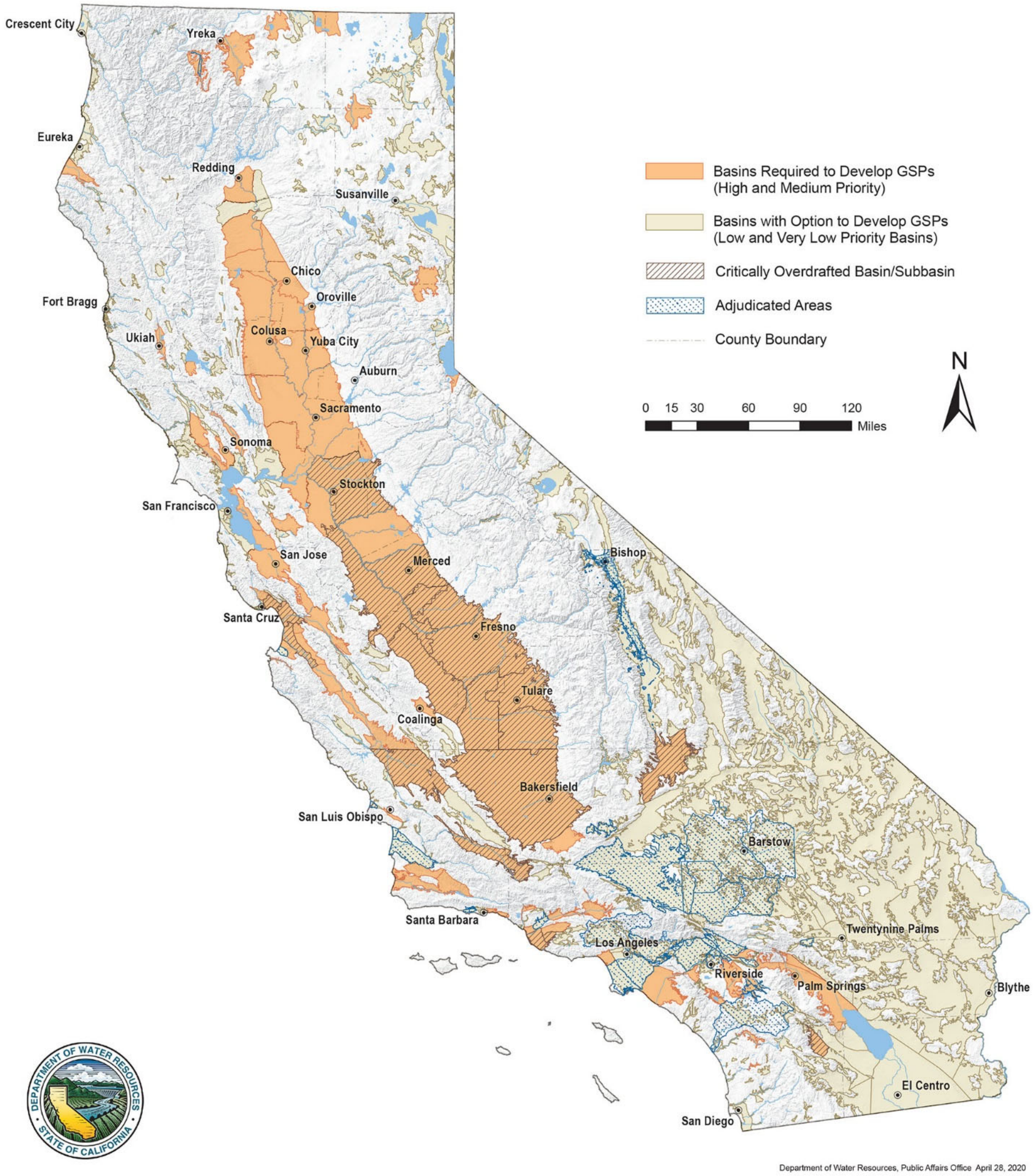
[175] Northern California Water Association (2006), pp. 6-111 through 6-120 (section re Sutter County).
[176] MWH Global, Inc. (2007).
[177] Cal. Water Code §§ 10720-10736.6.

**Figure 31. Prioritization of groundwater basins in California**




Source: Reprinted from California Department of Water Resources (2020).

By January 31, 2022, each GSA must adopt a groundwater sustainability plan ("GSP") for the Subbasin, or more than one plan with coordination between them. Because that deadline has not yet arrived, no GSA has adopted a GSP for the Subbasin. The agencies are currently working together to achieve a common technical understanding of the Subbasin, based on an updated C2VSim model. It is anticipated that the five GSAs will adopt a single GSP that covers the entire Subbasin. Note that the GSAs for Sacramento and Placer Counties are both joint powers authorities with multiple agency and private firm members, so that many water users across the Sacramento region are involved in the effort. For example, SGA is governed by a board of directors with 16 members, including representatives of both GSWC and NCMWC.

SGMA requires that a GSP include actions to achieve sustainable groundwater management, which is defined as the management and use of groundwater in a manner that can be maintained during a planning and implementation horizon of 50 years without causing undesirable results.[178] For purposes of the act, an undesirable result triggering non-sustainability would include:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion;
- Significant and unreasonable reduction of groundwater storage;
- Significant and unreasonable seawater intrusion;
- Significant and unreasonable degraded quality, including migration of contaminant plumes;
- Significant and unreasonable subsidence that substantially interferes with surface uses; or
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.[179]

A sustainability plan must include monitoring of groundwater levels, groundwater quality, land subsidence and changes in surface water flows that impact groundwater in the basin.[180] The plan must address mitigation of any overdraft, recharge and surface water supplies that have been used or are available for groundwater recharge or conjunctive use.[181] Where appropriate, a plan must include provisions related to replenishment of groundwater extractions, conjunctive use and underground water storage.[182] The GSP currently under development for the Subbasin will have each of those elements. In particular, the plan will focus on eliminating remaining areas of groundwater depression, conjunctive use of groundwater with surface water from the Sacramento and American Rivers, and developing underground storage. The plan will include measurable objectives to achieve and maintain sustainability of the Subbasin as an extension of the successful efforts begun in the 1990s.[183]

Because the GSP has not yet been prepared for the Subbasin, its details are not known at the current time. For example, it is not known whether GSWC will require any permits from the County of Sutter, acting as the GSA for the Subbasin, for the wells that will be used to supply groundwater to the Project and Sutter Pointe. The same is true of public water systems across California as SGMA is coming into effect. GSWC will take all actions required to secure and protect groundwater in the Subbasin as a supply for the Project and Sutter Pointe.

The primary consequence of SGMA for Sutter Pointe is expected to be continued stability in groundwater levels within the Natomas Basin and Subbasin into the foreseeable future. The required planning horizon for SGMA is 50 years, which exceeds the 20 year horizon for assessment of water supplies under SB 610. If a challenge were to arise for the sustainable use of groundwater in the Subbasin, SGMA would provide a mechanism to address that challenge, for the benefit of Sutter Pointe.

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[178] Cal. Water Code § 10721(q), (u).
[179] Cal. Water Code § 10721(w).
[180] Cal. Water Code § 10727.2(d)(1)-(2).
[181] Cal. Water Code § 10727.2(d)(3)-(5).
[182] Cal. Water Code § 10727.4.
[183] Cal. Water Code § 10727.2(b)(1).

## 5.5 Use of Groundwater for Sutter Pointe

Sections 5.1 through 0 of this Supplement discuss the general features of the Subbasin and provide context for the project-specific analyses contained in this Section 5.5. As explained in Section 5.2, there are three extant models that include the Sutter Pointe area: IGSM developed by the Water Forum parties in the 1990s; C2VSim developed by DWR in the 2000s and currently being updated; and CVHM developed by USGS in the 2000s and updated in 2015. Both C2VSim and CVHM were designed to analyze large-scale management decisions at the level of the Central Valley as a whole or regions such as the Subbasin. Neither was designed to analyze potential impacts to groundwater from pumping patterns in small areas or from specific land developments. Thus, although both of those models were used in preparation of this Supplement to understand the Subbasin in general terms, no individual run of either model would be useful to analyze the proposed use of groundwater for Sutter Pointe. The only model that has been developed for use at the scale of Sutter Pointe is the IGSM, which was used by the WSA and continues to be relied upon by this Supplement. The following subsections discuss those modelling efforts.

### 5.5.1 Model Projections by WRIME

As described in Section 2.3, NCMWC has supplied surface water for agricultural use in the Natomas Basin for the past 100 years. As urban development of the North Natomas area occurred during the 1990s and early 2000s, and NCMWC anticipated further conversion of agricultural lands in future, the company prepared and adopted an Integrated Water Resources Management Plan to understand how its water supplies might be used and impacted.[184]

As part of that effort, NCMWC engaged the consultancy WRIME to assess the impact on local groundwater resources from the conversion of lands from agriculture to urban development. Expected urban developments included 11,100 acres in Sacramento County and 7,700 acres in Sutter County, which roughly correlated to lands in South Natomas, Sacramento International Airport, North Natomas, Metro Air Park, Greenbriar, Grandpark and Sutter Pointe. WRIME used the IGSM discussed in Section 5.1.6 to evaluate impacts on groundwater levels over a 20-year period, which was presumed to be from 2010 through 2030. While the period of development has shifted to later dates, the resulting water demands are similar. In particular, WRIME's Alternative 3 scenario assumed that 50 percent of urban water supplies in Sutter County (14,700 AFY) would be met using groundwater, and the other 50 percent (14,700 AFY) using surface water from the Sacramento River.

Based on use of the IGSM, WRIME determined that supplying a mixture of surface water and groundwater to meet the demands of expected urban development would result in groundwater elevations within the Sutter Pointe area between 5 and 15 feet higher than under pre-conversion conditions, with no adverse impacts on regional groundwater conditions.[185] The reason for that modeled impact was that urban developments were expected to have lower overall water demands than agricultural irrigation, which leads to lower groundwater production from the aquifers underlying the Natomas Basin. That expected impact on water demands resulting from conversion of land from agricultural to urban uses is consistent with the discussion in Section 2.7 of this Supplement.

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[184] Natomas Central Mutual Water Company (2006).

[185] WRIME (2005), pp. 7-8, Table 2, Figures 22-25, 30, 33 (analysis of Alternative 3).

### 5.5.2 Model Projections by LSCE

The Sutter Pointe developers engaged the consultancy LSCE to evaluate potential impacts on groundwater from their project in 2008. The results of that analysis were published in the Sutter Pointe Specific Plan Groundwater Supply Assessment in June 2008.

LSCE used the IGSM to compare groundwater conditions under several scenarios, including an existing conditions baseline (based on land uses and water demands in the Natomas Basin as of 2004, the last year for which data were available before conducting the study) and a future conditions baseline (based on expected developments in the Subbasin other than Sutter Pointe). LSCE also modeled the impact on groundwater in the Subbasin from the Preferred Water Supply Program (13,075 AFY of groundwater and 12,125 AFY of surface water), Alternative A Water Supply Program (9,560 AFY of groundwater and 15,640 AFY of surface water) and Alternative B Water Supply Program (6,580 AFY of groundwater and 18,620 AFY of surface water). Each of the potential future scenarios assumed certain conditions for non-Sutter Pointe land uses in the Natomas Basin: buildout of certain urban developments that were in planning at the time (Metro Air Park, Greenbriar and North Natomas), an overall increase in urban water demands, and a decrease in agricultural demands based on the conversion of certain lands from agricultural to urban use. Total water demands in the Natomas Basin were estimated to be 198,865 AFY, an increase of about 6 percent from baseline conditions.[186]

Model results for the existing conditions baseline found overall stable conditions for groundwater levels, with no discernable upward or downward trends. For the future conditions baseline, the model predicted groundwater levels approximately 10 feet higher than under the existing conditions baseline, because of the transition from use of groundwater to surface water by urban water systems in the Sacramento County portion of the Subbasin outside the Natomas Basin.[187]

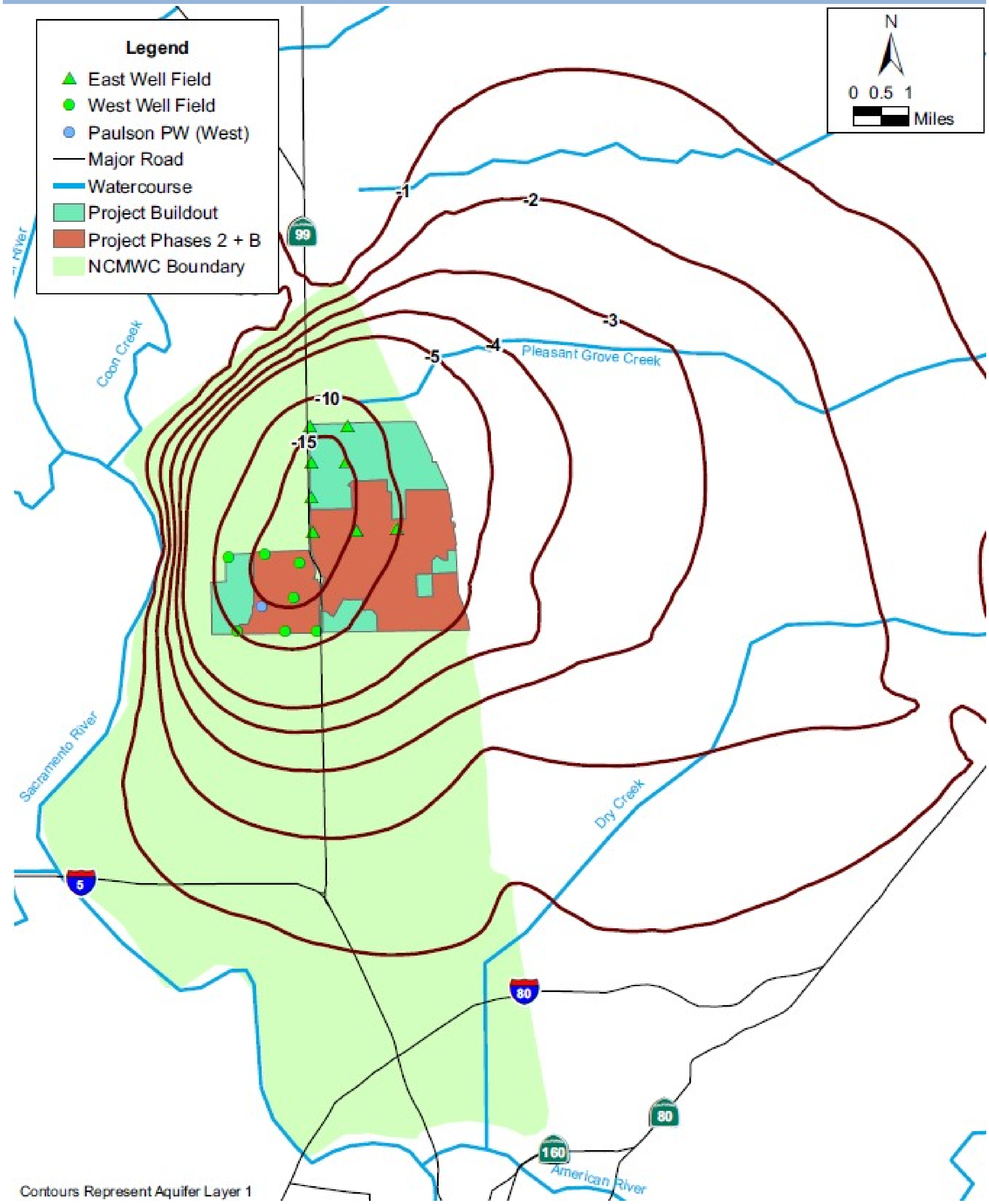
Modeling of the Preferred Water Supply Program resulted in groundwater elevations within Sutter Pointe of between 20 and 35 feet below ground surface. When compared to the future conditions baseline, the production of 13,075 AFY of groundwater in the Preferred Water Supply Program would lower groundwater levels between 5 and 20 feet, as shown in Figure 32. When compared to the thickness of groundwater-bearing formations underlying Sutter Pointe of more than 1,200 feet, lowering of groundwater levels by 20 feet would be insignificant. That level of drawdown would not have any impact on the availability of groundwater for Sutter Pointe, nor would it negatively impact other users of groundwater in the Subbasin.[188]

Analysis of the Alternative A and Alternative B Water Supply Programs showed less impact on groundwater levels than the Preferred Water Supply Program. That result would be expected based on the lower quantity of groundwater used in the alternative scenarios. The Alternative A Water Supply Program would result in groundwater levels that are 0 to 10 feet lower than the future conditions baseline, while the Alternative B Water Supply Program would lower groundwater levels by 0 to 5 feet.[189]

For all scenarios, the model found that groundwater level impacts would be localized in the Sutter Pointe area. For the Proposed Water Supply Program, production of 13,075 AFY for Sutter Pointe would result in maximum off-site drawdowns of slightly more than 15 feet in Sutter County and about 10 feet in Sacramento County. These drawdowns are considered to be relatively small, and they would not affect the availability of groundwater for any other users in the Subbasin.[190]

[186] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 15-17, Table 2-3.
[187] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 52-58.
[188] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 60-62, Tables 6-9 through 6-12.
[189] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 62-64, Tables 6-13 through 6-18.
[190] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), pp. 64, 68-69; Tully & Young (2008), p. 62.

**Figure 32. Impact of Preferred Water Supply Program on groundwater levels**




Source: Reprinted from Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), Figure 6-12.

Based on the modeling effort, LSCE concluded that groundwater supplies from the Natomas Basin and Subbasin are sufficient to meet the demands of Sutter Pointe in the amount of 13,075 AFY for more than 20 years.[191] Because groundwater conditions have not changed significantly since preparation of the 2008 study by LSCE, and the IGSM remains the best model for determining the potential impact of groundwater pumping for the Project and Sutter Pointe on elevations in the Subbasin, this Supplement relies on the LSCE analysis for its conclusions.

## 5.6 Conclusions

Based on the analysis above, it is expected that the conversion of lands from agricultural to urban uses for the Project and Sutter Pointe, and the use of groundwater to support those developments, will have the following features:

- Use of up to 3,500 AFY of groundwater for the Project will not have a substantial impact on groundwater elevations or quality in the Natomas Basin or the Subbasin more broadly. Based on stable groundwater levels in the Natomas Basin during a long historical period with greater groundwater production than proposed for the Project (4,200 AFY), and the initiation of groundwater management across the Subbasin under SGMA, it is highly likely that groundwater levels in the Project area will remain high for the foreseeable future. Groundwater is expected to be available in quantities that will satisfy all water demands of the Project, for more than 20 years.
- Use of up to 8,400 AFY of groundwater for Sutter Pointe would be similar to historical production of groundwater for agricultural irrigation of those lands.[192] Based on the same rationale as expressed in the prior bullet, it is highly likely that groundwater levels in the Sutter Pointe area would remain stable with that quantity of groundwater production.
- According to the model analysis conducted by LSCE, use of up to 13,075 AFY of groundwater for Sutter Pointe would result in groundwater elevations that are approximately 5 to 20 feet lower than would be predicted without Sutter Pointe. That decline is relatively small, would not produce any undesirable results for purposes of SGMA, and would not impact the availability of groundwater for Sutter Pointe or other water users.
- According to the model analysis conducted by WRIME, use of up to 14,700 AFY of groundwater for Sutter Pointe would result in groundwater elevations that are approximately 5 to 15 feet higher than historical conditions. Thus, while the WSA and this Supplement propose groundwater usage for Sutter Pointe up to 13,075 AFY, it would be possible for GSWC to produce even greater quantities without lowering groundwater levels or producing undesirable results for the Subbasin.
- SGMA and the GSP to be adopted for the Subbasin will protect the availability of groundwater for the Project for at least 50 years in future.
- It is expected that groundwater from the Subbasin, up to at least 13,075 AFY, will be available to supply Sutter Pointe, for more than 20 years.
- It is recognized that the Project will not require the full volume of 13,075 AFY. Groundwater from the Subbasin will be available to meet the full demands of the Project at 3,500 AFY, for more than 20 years.

[191] Luhdorff & Scalmanini Consulting Engineers, Inc. (2008), p. 72; Tully & Young (2008), pp. 65-66.
[192] See Figure 13.

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# Section 6 Sacramento River Supplies

## 6.1 The Sacramento River

The Sacramento River is the largest river and watershed system in California.[193] The watershed drains an area of 26,150 square miles, including the northern portion of the Central Valley, the Coast Range to the west, the Sierra Nevada to the east, and the Klamath Mountains and Cascade Range to the north.[194] The mainstem of the river flows for 384 miles from its headwaters near Mount Shasta to the Sacramento-San Joaquin Delta ("Delta"). Average annual discharges of the Sacramento River are 17.2 million AF and make up approximately one-third of the state's surface water supplies.

The Sacramento River and its tributaries serve as the source of water supplies for the two largest water projects in California: the Central Valley Project owned and operated by USBR; and the State Water Project owned and operated by DWR. The Central Valley Project includes Shasta Dam, which is located on the main stem of the Sacramento River at the head of the Sacramento Valley and provides storage for up to 4.5 million AF. The Central Valley Project delivers on average over 7 million AFY of water to a variety of entities, which use the water for agricultural, domestic, municipal, industrial, wildlife and other purposes.[195]

Use of surface water from the Sacramento River for Sutter Pointe was included in the WSA, Section 3.3. The discussion in the WSA remains relevant, as updated by this Supplement. Note that surface water from the Sacramento River will not be used to supply the Project, but will be used to supply the greater Sutter Pointe development once phases are constructed beyond the Project.

## 6.2 Natomas Central Mutual Water Company

### 6.2.1 Overview of the Company

The history of NCMWC and its place in the development of the Natomas Basin was described in Section 2. Today, NCMWC is a mutual water company that delivers irrigation water supplies to approximately 280 shareholders in Sutter and Sacramento Counties. The company's service area includes roughly 53,500 acres, of which 31,015 acres are owned or controlled by shareholders qualified to receive water deliveries. The service area and lands served are shown in Figure 6.

This Supplement analyzes the reliability of surface water rights held by NCMWC on the Sacramento River on a long-term basis. Those rights have historically been used to serve irrigation water to NCMWC shareholders within its service area, including approximately two-thirds of Sutter Pointe, and that use will continue in future. In addition, as the Natomas Basin continues to urbanize, NCMWC will supply water for growing municipal and industrial uses on a wholesale level. Since a large quantity of land within the NCMWC service area will be dedicated to natural habitat and open space, the company will also be called upon to serve water for environmental purposes, mostly through the Natomas Basin Conservancy.

[193] Sacramento River Watershed Program (2010), p. 5.
[194] California Department of Public Works, Division of Water Resources (1931), p. 27.
[195] Water Education Foundation (n.d.).

### 6.2.2 Water Distribution System

NCMWC uses two discrete canal systems to distribute irrigation water to shareholders within its service area. First, highline canals are located above ground level and use gravity flow to deliver water to shareholder gates. The highline canals generally flow from points of diversion on the Sacramento River or Natomas Cross Canal toward the south and east. Second, drainage canals are located below ground level and collect agricultural tailwater from fields within the service area. Once that water is collected, it is conveyed via the drainage canals for reuse elsewhere in the service area. Because drainage canals are set at elevations below adjoining fields, water must be lifted from the drainage canals by pumps into a highline canal or directly onto a field. Since all fields within the service area drain to these drainage canals, NCMWC is able to recapture and recirculate all tailwater that was originally delivered to its shareholders. In some areas, the drainage canals also capture tailwater that was originally sourced from groundwater pumped by shareholders for use on their own lands. The drainage canal system is owned by RD 1000, but is operated by NCMWC during the irrigation season as an integrated system with the highline canals.

The highline canal system is further divided into five distribution systems, each of which historically had its own point of diversion from the Sacramento River or Natomas Cross Canal. Salient features of those systems are described in Table 17. The distribution systems are linked by the drainage system, and each of the diversion pumping plants has the ability to pump directly into the drainage system as well as the highline system.

**Table 17. NCMWC distribution systems**

| System | Location of Diversion | Pumping Plant | Flow Capacity | Area Served |
|---|---|---|---|---|
| Northern | Natomas Cross Canal | Northern | 250 CFS | 12,500 acres |
| Bennett | Natomas Cross Canal | Bennett | 125 CFS | 5,700 acres |
| Central | Sacramento River Mile 75.3 | Prichard | 150 CFS | 7,700 acres |
| Elkhorn | Sacramento River Mile 73.3 | Elkhorn | 60 CFS | 2,800 acres |
| Riverside | Sacramento River Mile 65.4 | Riverside | 45 CFS | 2,700 acres |

The primary crop grown in the NCMWC service area is rice. Irrigation of rice fields generally involves flooding, which is accomplished in a relatively short period of time at planting. During flooding, which typically lasts from mid-April through mid-May depending on local temperatures and precipitation, all diversion pumping plants are turned on at or near 100 percent capacity. During the irrigation season, the canal systems are generally operated as a “closed loop”, meaning that no water is discharged from the system to the Sacramento River as return flows. Surface water is diverted from the Sacramento River as needed to keep the highline and drainage canal systems full. The drainage canals are maintained at the highest level practical without impacting proper drainage from adjacent fields. By utilizing the drainage canal system, NCMWC recirculates a significant amount of water per year for reuse.

At the end of the irrigation season, the fields are drained, leading to high flows in the drainage canal system. Supply from the Sacramento River is ceased, and water is recirculated to the highline canals to increase the capacity of the system to handle all tailwater flows. At the same time, RD 1000 turns on its drain pumps to pump excess water out of the Natomas Basin and into the Sacramento River.[196]

In addition to irrigation water supplies, NCMWC delivers water for a limited number of non-agricultural uses, including irrigation of the Teal Bend Golf Course and landscaping at Sacramento International Airport.

[196] NCMWC (2006), pp. 5-9.

### 6.2.3 Water Rights

As described in Section 2.3, Natomas Company formed NCMWC and three other mutual water companies that have since been merged into NCMWC, for the purpose of diverting surface water from the Sacramento River and distributing that supply to landowners within their service areas. Following sale of the Natomas Basin lands by Natomas Company, the landowners within the NCMWC are also the shareholders of, and through that mechanism control, the company.

Some lands within the service areas of the Natomas mutual water companies held riparian rights, but most lands relied on appropriative rights for use of water from the Sacramento River. A summary of riparian acreage within the Natomas mutual water companies as of 1958 is set forth in Table 18.

**Table 18. Riparian acreage in the Natomas mutual water companies, 1958**

| Company | Riparian Acreage | Overlapped Riparian Acreage | Total Appropriative Acreage |
|---|---|---|---|
| Elkhorn Mutual Water Company | 1,247 | 426 | 5,478 |
| Natomas Central Mutual Water Company | 1,061 | 270 | 22,930 |
| Natomas Riverside Mutual Water Company | 830 | 870 | 2,653 |

Source: California Department of Water Resources (1958), pp. 59, 109, 122, 132-133.

From 1916 through 1919, Natomas Company filed four water right applications with the State Water Commission, a predecessor agency to the SWRCB. In 1926, Natomas Company transferred those rights to the mutual water companies, and the companies filed additional applications with the SWRCB in 1953, 1965 and 1978. The SWRCB has issued permits for all seven applications, and licenses for six of the rights, as shown in Table 19. Note that the holder of a water right permit may apply for a license from the SWRCB, but issuance of a license is not necessary to validate the water right. For example, the water rights used by the Central Valley Project and State Water Project are the subject of permits, but have not been licensed.

**Table 19. NCMWC appropriative water rights before the SWRCB**

| Application | Permit | License | Priority Date | Diversion Periods | Diversion Rate (CFS) | Diversion Amount (AFY) |
|---|---|---|---|---|---|---|
| 534 | 247 | 1050 | 12.13.1916 | 4.1 to 10.1 | 42.18 | |
| 1056 | 511 | 2814 | 8.22.1918 | 3.15 to 10.15 | 38.00 | |
| 1203 | 580 | 3109 | 3.5.1919 | 5.1 to 10.31 | †160.00 | |
| 1413 | 1129 | 3110 | 8.27.1919 | 5.1 to 10.1 | †120.00 | |
| 15572 | 15150 | 9794 | 10.8.1953 | 4.1 to 6.30 | 131.00 | 11,846 |
| 22309 | 15314 | 9989 | 10.8.1965 | 3.1 to 6.30<br>9.1 to 10.31 | 14.00 | 2,627 |
| 25727 | 19400 | N/A | 5.1.1978 | 10.1 to 4.1 | 168.00 | 10,000 |

† Diversions under Licenses 3109 and 3110 are limited to combined 270 CFS.

NCMWC's permits allow direct diversion from the Sacramento River and Natomas Cross Canal. The authorized season of diversion varies according to each permit, but taken collectively they authorize a season of diversion extending year-round, with the bulk of water diversions during the period from April 1 through October 31. The maximum amount of water that may be diverted under all permits is 135,448 AFY. The authorized place of use comprises 51,091 acres in the NCMWC service area. Each of the rights is described below.

- License 1050, with a priority date of December 13, 1916 and issued on May 28, 1931, is jointly held by NCMWC and the Siddiqui Family Partnership, a landowner within the Natomas Basin. It allows diversion of 42.18 CFS from the Sacramento River from April 1 through October 1 of each year for irrigation purposes. The right was initially assigned by Natomas Company to Elkhorn MWC, but passed to NCMWC when the companies merged in 1961.[197]

- License 2814, with a priority date of August 22, 1918 and issued on February 18, 1946, was originally assigned by Natomas Company to Natomas Riverside MWC and subsequently acquired by NCMWC when the two companies merged in 1963. License 2814 grants NCMWC the right to divert 38 CFS from the Sacramento River from March 15 to October 15 of each year for irrigation purposes.[198]

- License 3109, with a priority date of March 5, 1919, was issued to NCMWC on November 14, 1949. It allows the diversion of up to 160 CFS from the Sacramento River from May 1 to October 31 of each year for irrigation purposes.[199]

- License 3110, with a priority date of August 29, 1919, was granted to NCMWC on September 28, 1950. This right was originally held by Natomas Northern MWC before that company was dissolved in 1938 and its service area transferred to NCMWC. License 3110 allows the diversion of 120 CFS from the Sacramento River from May 1 to October 1 of each year for irrigation purposes.[200]

- The SWRCB issued License 9794 to NCMWC on May 26, 1971. It has a priority date of October 8, 1953 and allows the diversion of 131 CFS from the Sacramento River from April 1 to June 30 for irrigation purposes.[201]

- The SWRCB issued License 9989 to NCMWC on January 26, 1973, with a priority date of October 8, 1965. This right allows NCMWC to recycle up to 2,627 AFY of agricultural tailwater within the drainage system owned by RD 1000, for irrigation use. The season of diversion is split into two parts, from March 1 through June 30 and from September 1 through October 31.[202]

- Permit 19400, with a priority date of May 1, 1978, was issued to NCMWC on February 7, 1985 for the diversion of 168 CFS from the Sacramento River between October 1 and April 1, up to a maximum of 10,000 AFY. This permit is primarily used to divert water for rice field reflooding. NCMWC has not sought and the SWRCB has not issued a water rights license based on diversions under Permit 19400.[203]

On July 12, 1990, the SWRCB modified Licenses 1050, 2814, 3109, 3110 and 9794 and Permit 19400 by approving the use of water for domestic, municipal and industrial purposes, as well as irrigation, within a limited area including the Sacramento International Airport, Metro Air Park and Teal Bend Golf Course.

[197] California State Water Resources Control Board (1931).
[198] California State Water Resources Control Board (1946).
[199] California State Water Resources Control Board (1949).
[200] California State Water Resources Control Board (1950).
[201] California State Water Resources Control Board (1971).
[202] California State Water Resources Control Board (1973).
[203] California State Water Resources Control Board (1985).

NCMWC had petitioned for the modification to meet the water demands of increasing urbanization in that area. In addition to the expansion of authorized uses, the modification also imposed additional conditions on exercise of the licensed rights regarding the location of the point of diversion and total amount that may be diverted under the covered licenses and permit combined (no more than 10,000 AFY from October 1 to April 1), and the jurisdiction of the SWRCB.

### 6.2.4 Settlement Contract

When USBR constructed and began operating the Central Valley Project in the late 1940s, disputes arose regarding the water rights of parties that had previously diverted water from the Sacramento River. After years of litigation, USBR entered into settlement contracts with numerous landowners, mutual water companies and water districts along the Sacramento River, including NCMWC. The holders of prior water rights agreed to allow USBR to operate the Central Valley Project without interference, in exchange for USBR making water available on an agreed-upon schedule. USBR agreed to deliver water to these settlement contractors in two categories: "Base Supply" that is not subject to federal reclamation laws and totals approximately 1.78 million AFY; and "Project Water" that is subject to reclamation laws and totals about 0.34 million AFY.

USBR and NCMWC entered into Settlement Contract No. 14-06-200-885A on April 29, 1964. That contract was set to expire in 2004, but was temporarily extended until 2005 and then renewed by Settlement Contract No. 14-06-200-885-R-1 for a term until March 31, 2045 (each during its term the "Settlement Contract"). The Settlement Contract provides for the delivery of water to NCMWC during the months of April through October, but does not affect NCMWC's rights during the winter months from November through March. During the contract delivery months, Base Supply may be diverted without any payment to USBR, whereas NCMWC is required to pay for Project Water based on rates set by USBR under federal reclamation laws. The Settlement Contract reflects the fact that it represents a settlement of the water rights claims of the parties. Relevant provisions expressly preserve each party's underlying water rights in the event of a general stream adjudication of the Sacramento River or the expiration or termination of the Settlement Contract.

Under the Settlement Contract, NCMWC may divert water from the Sacramento River as shown in Table 20. The primary difference between the original and renewed contracts is a reduction in Project Water entitlement from a total of 47,800 to 22,000 AFY. That contract reduction reflected the actual use of water by NCMWC rather than a substantive abdication of any water entitlement.

**Table 20. NCMWC diversion rights (AF) in the Settlement Contract**

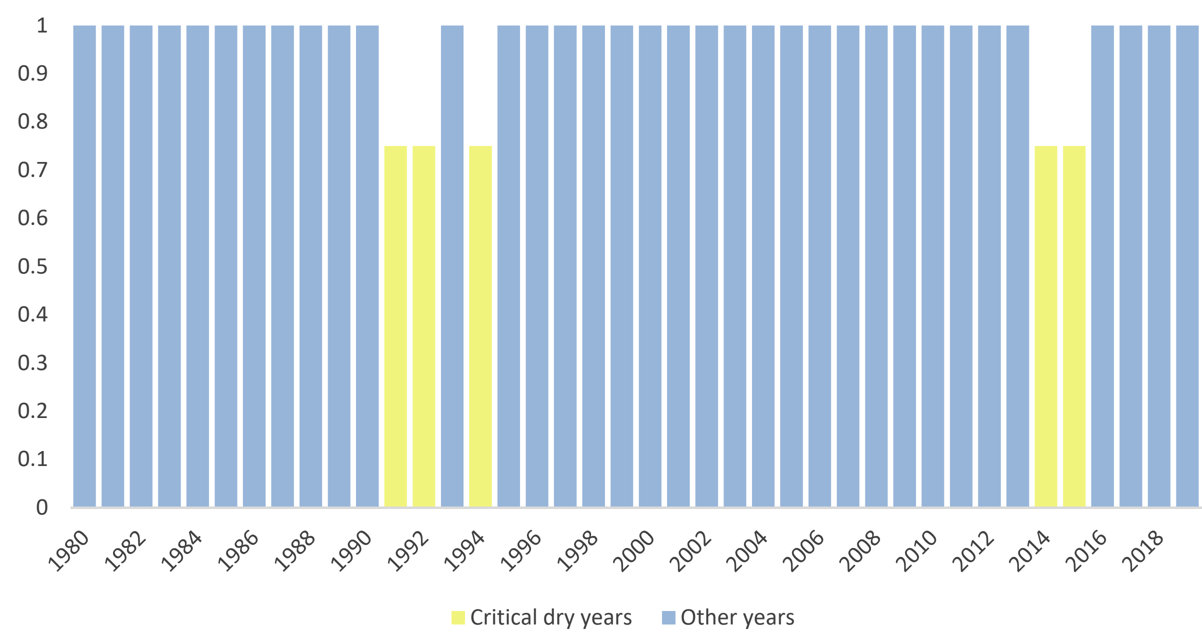
| | 1964-2004 | | | 2005-2045 | | |
|---|---|---|---|---|---|---|
| **Month** | **Base Supply** | **Project Water** | **Total** | **Base Supply** | **Project Water** | **Total** |
| April | 14,000 | 0 | 14,000 | 14,000 | 0 | 14,000 |
| May | 27,700 | 0 | 27,700 | 27,700 | 0 | 27,700 |
| June | 23,000 | 2,400 | 25,400 | 23,000 | 0 | 23,000 |
| July | 11,500 | 18,300 | 29,800 | 11,500 | 7,200 | 18,700 |
| August | 3,900 | 24,600 | 28,500 | 3,900 | 14,800 | 18,700 |
| September | 16,100 | 2,500 | 18,600 | 16,100 | 0 | 16,100 |
| October | 2,000 | 0 | 2,000 | 2,000 | 0 | 2,000 |
| **Total** | **98,200** | **47,800** | **146,000** | **98,200** | **22,000** | **120,200** |

Both Base Supply and Project Water are available in two tranches: 75 percent of each entitlement is available in all years, and is a “firm” supply; the remaining 25 percent of each entitlement is available in all years except critical dry years, and thus is considered to be a “non-firm” supply for purposes of this Supplement. A year is considered to be critically dry if either of the following conditions exists:

- The forecasted full natural inflow to Shasta Lake for the water year, as such forecast is made by USBR on or before February 15, is equal to or less than 3.2 million AF; or
- The total accumulated actual deficiencies below 4 million AF in the immediately prior water year, or successive prior water years, each of which had inflows of less than 4 million AF, together with the forecasted deficiency for the current water year, exceed 800,000 AF.

The yield of the Settlement Contract to NCMWC over the past 40 years is shown in Figure 33. Of those 40 years, critical conditions existed in five, which is 12.5 percent of years during that historical period. For purposes of this Supplement, the NCMWC water supply tranches are aligned with the terminology used in SB 610, so that 100 percent of the contract entitlement is expected to be available in normal years and 75 percent to be available in single and multiple dry years. This Supplement does not rely on any assumptions regarding the occurrence of critical conditions, as sufficient surface water supplies will be available to meet all Sutter Pointe water demands even during critical years, pursuant to the analysis in Section 7.1.

**Figure 33. Yield of the NCMWC Settlement Contract, 1980-2019**



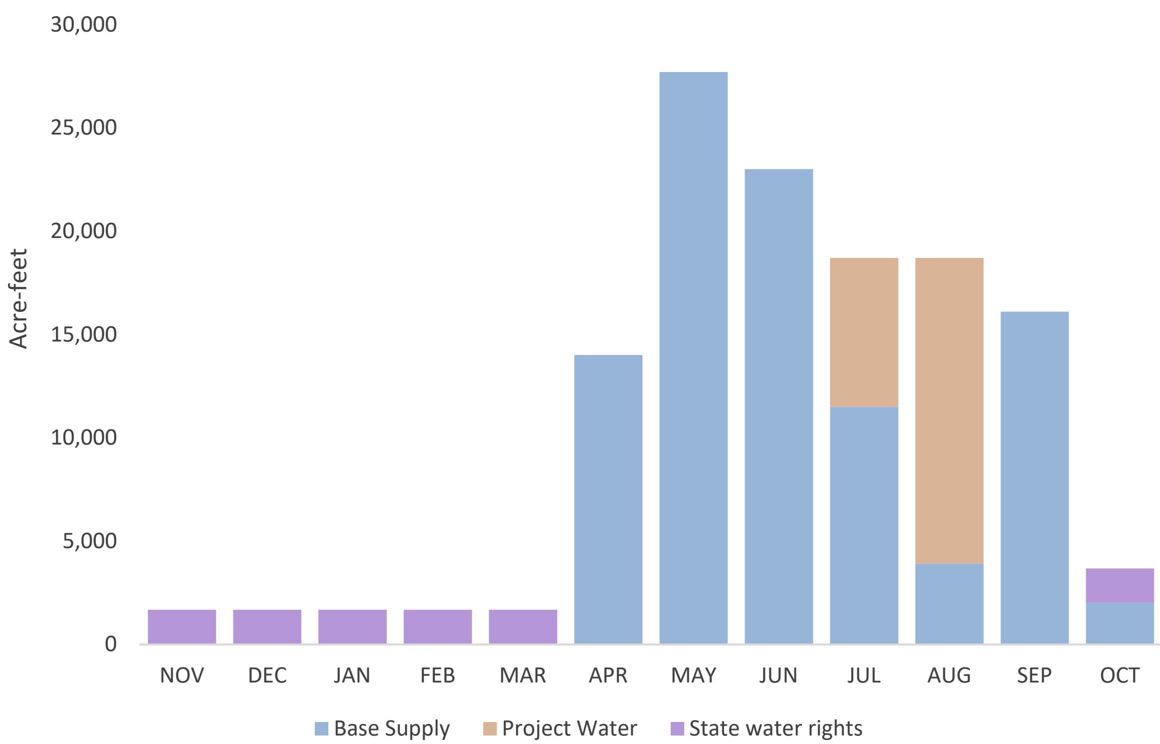

Source: United States Bureau of Reclamation (2020).

The Settlement Contract has a term of 40 years and will expire on March 31, 2045. It provides that under terms and conditions agreeable to both parties, renewals may be made for successive periods not to exceed 40 years each. It may be reasonably expected that on or before 2045, NCMWC and USBR will agree to extend the Settlement Contract for another 40 years, or NCMWC may choose to allow the contract to expire and rely on its pre-existing water rights. Under either scenario, the current Settlement Contract will be in effect for more than the 20-year planning horizon required by SB 610, and NCMWC has legally valid rights to divert and use water from the Sacramento River on a permanent basis.

The Settlement Contract recognizes that land and water uses within the NCMWC service area are expected to change within the current 40-year term, from agricultural to a mixture of urban, agricultural and wildlife habitat uses. NCMWC and USBR have agreed to work cooperatively to accommodate and facilitate such change. In order for NCMWC to deliver water for urban use outside the area of Sacramento International Airport or Metro Air Park, NCMWC would need to obtain the written consent of USBR. That agency may not unreasonably withhold such consent and must render a decision in a timely manner.

Although the Settlement Contract limits diversion of water by NCMWC from the Sacramento River during the period from April through October, the renewal contract recognizes that NCMWC has formed additional state law water rights since execution of the original contract and allows NCMWC to divert water under those rights in addition to the amounts listed in Table 20. Like the original Settlement Contract, the renewal recognizes that NCMWC may divert water for use from November through March without limitation by the federal government. The NCMWC water rights that currently exist outside the scope of the Settlement Contract are License 9989 and Permit 19400. As described in Section 6.2.3, License 9989 authorizes diversions of runoff water from the drains of RD 1000, but Permit 19400 allows NCMWC to divert additional water from the Sacramento River. The combined rights of NCMWC are shown in Figure 34.[204]

**Figure 34. NCMWC monthly diversion rights from the Sacramento River**




### 6.2.5 NCMWC Diversions

NCMWC and its predecessors have diverted water from the Sacramento River for over 100 years, pursuant to their water rights and, since 1964, the Settlement Contract. Annual diversions over the past 20 years are shown in Figure 35, and monthly distribution of those diversions is depicted in Figure 36.

[204] Settlement Contract (1964, 2005).

**Figure 35. NCMWC diversions from the Sacramento River, 2000-2019**

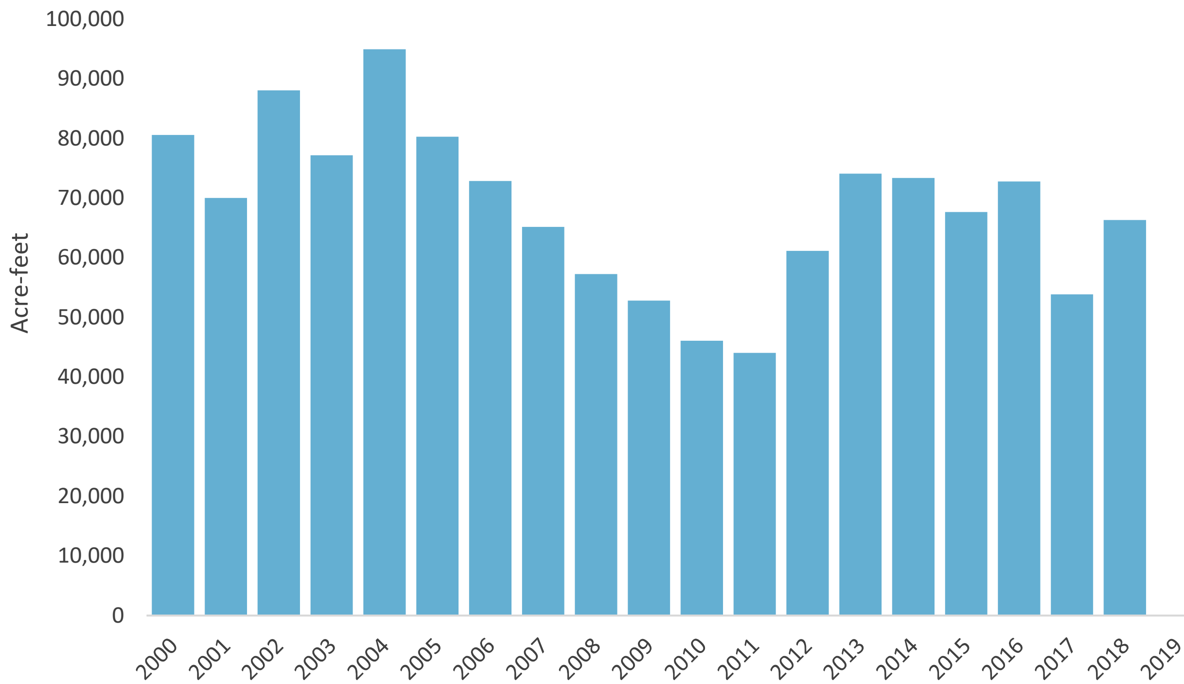
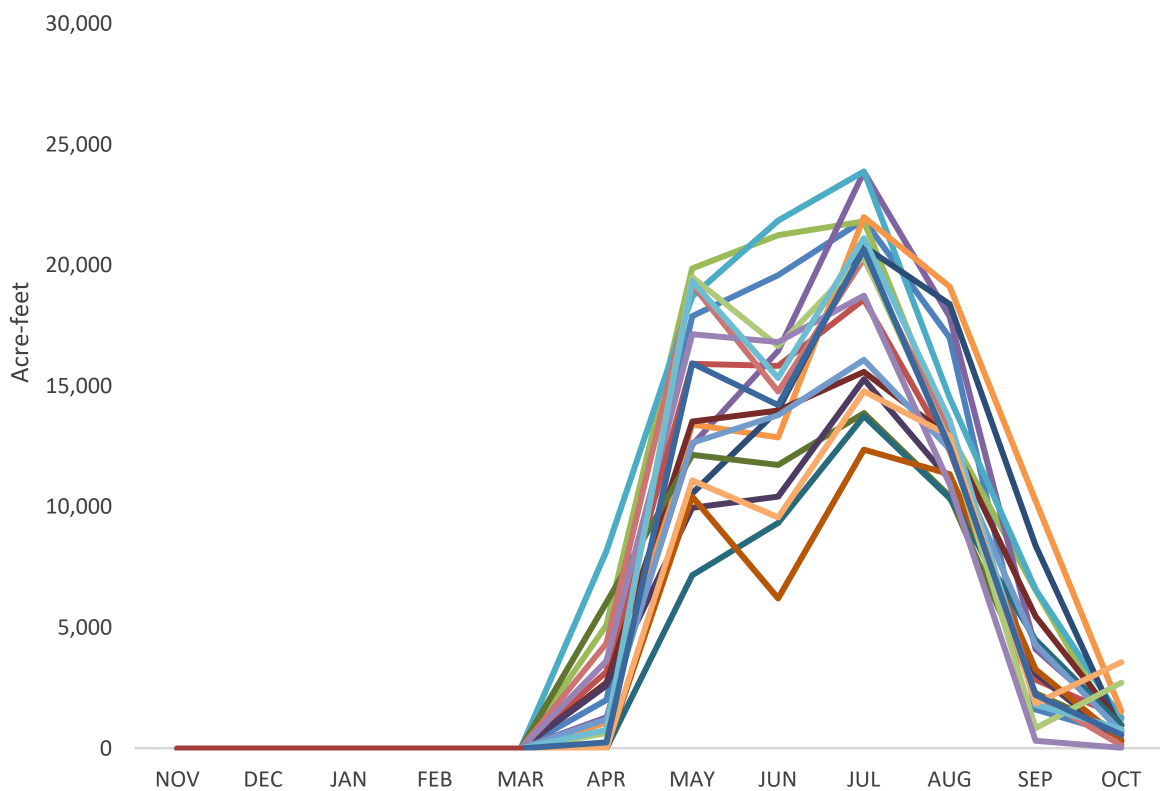



**Figure 36. Monthly distribution of NCMWC diversions, 2000-2019**



### 6.2.6 Water Deliveries

Once NCMWC diverts water from the Sacramento River, it delivers that water to its shareholders according to a set of internal rules. The company bylaws provide that shareholders are entitled to delivery of water based on their proportional ownership of shares in the company:

> The quantity of water to which any shareholder shall be entitled shall not exceed the quantity necessary for use within the service area of the Corporation, and shall be such proportionate quantity of all the water available for distribution, at the time water delivery is requested, among all the shareholders of the Corporation desiring to be supplied with water, as the number of shares owned by him shall bear to the whole number of shares owned by the shareholders desiring to be supplied with water.[205]

Shares are issued based on acreage of land within the service area, with one share issued per acre of land,[206] and shares are made appurtenant to specific parcels of land when issued, as noted on the share certificate.[207]

Irrigation of rice fields involves flooding, which is accomplished in a relatively short period of time at planting. During flooding, which typically lasts from mid-April through mid-May depending on local temperatures and precipitation, the diversion pumping plants are turned on at or near 100 percent capacity. Flows are directed to each field in turn, rather than dividing flows between multiple fields at the same time. Given that practice, and the fact that water deliveries flow through a distribution system with inherent capacities and limitations, NCMWC has established internal processes for the fair distribution of water supplies that do not strictly match proportionality.

### 6.2.7 Litigation

The WSA reported on certain litigation by the Natural Resources Defense Council ("NRDC") and other environmental organizations against USBR related to deliveries of water under the Settlement Contract with NCMWC and other settlement and project water contracts for the Central Valley Project. In November 2008, the United States District Court for the Eastern District of California found that USBR had failed to complete adequate consultation under Section 7 of the Endangered Species Act ("ESA") with the United States Fish and Wildlife Service ("USFWS") related to potential impacts of Central Valley Project operations on endangered fish species, including delta smelt.[208] After publication of the WSA, that decision was appealed to the United States Court of Appeals for the Ninth Circuit.

The Ninth Circuit released its decision on April 16, 2014, holding that USBR possessed some discretion when entering into the Settlement Contract, and therefore the agency needed to consult with USFWS in reliance on a valid biological opinion. Because the biological opinion that had been completed prior to renewal of the Settlement Contract in 2005 was legally deficient, so was the consultation process under the ESA.[209] In order to resolve that deficiency, USBR reinitiated consultation with USFWS, which was completed on December 14, 2015 by USFWS sending a letter of concurrence that the impacts of contract renewals were properly assessed in a 2008 biological opinion. Based on that informal consultation with USFWS, USBR ratified the renewed 2005 Settlement Contract with NCMWC.

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[205] Natomas Central Mutual Water Company (1998), Art. XII, § 7.
[206] Natomas Central Mutual Water Company (1998), Art. IV, § 2,
[207] Natomas Central Mutual Water Company (1998), Art. IX, § 2.
[208] Tully & Young (2008), pp. 18-19.
[209] Natural Resources Defense Council v. Jewell (2014) pp. 784-785.

NRDC filed a Sixth Supplemental Complaint in the litigation on March 12, 2018, alleging violations of both Sections 7 and 9 of the ESA. On February 26, 2019, the District Court granted summary judgment in favor of USBR and NCMWC related to claims that reconsultation was inadequate under Section 7 of the ESA.[210] On January 22, 2020, the District Court stayed the only remaining claim in the litigation related to an alleged violation of Section 9 of the ESA, based on issuance by the National Marine Fisheries Service ("NMFS") of a new biological opinion for impacts of the Central Valley Project on endangered salmon species on October 22, 2019.[211] As of preparation of this Supplement, the only litigation concerning the Settlement Contract is based on Section 9 of the ESA, and that claim is stayed for the indefinite future. Notably, if the Section 9 claim were upheld by the courts, that occurrence would not undermine the continuing validity of the Settlement Contract since that claim does not seek to set aside the contract. Because the Settlement Contract has a term through March 31, 2045, it will be in effect longer than the 20-year planning horizon required for this Supplement.

On October 21, 2019, USFWS and NMFS issued new biological opinions on the coordinated operations of the Central Valley Project and State Water Project. A group of fishing industry and environmental interest organizations challenged the validity of those biological opinions under the ESA, the Administrative Procedure Act and the National Environmental Policy Act, and their claims are currently pending in the United States District Court for the Eastern District of California.[212] The State of California has challenged the validity of the biological opinions on similar grounds, but also alleges that USBR's operations of the Central Valley Project violate the California Endangered Species Act because USBR failed to obtain an incidental take permit from the California Department of Fish & Wildlife ("CDFW"), and its claims are also pending in the U.S. District Court for the Eastern District of California.[213]

NCMWC has intervened as a defendant in both cases. Although neither case directly challenges the validity of NCMWC's Settlement Contract, any relief granted in either case could potentially affect USBR's performance of the Settlement Contract. This is particularly true of any relief that requires USBR to change how it operates the Central Valley Project's Shasta Division to ensure sufficiently cool water temperatures in the upper Sacramento River for endangered salmonids. The District Court, however, recently declined to grant aspects of the plaintiffs' motions for preliminary injunction with respect to USBR's temperature management operations in the upper Sacramento River.[214]

Finally, numerous parties holding contracts with USBR, including NCMWC, have challenged DWR's approval of the long-term operational plans for the State Water Project and CDFW's issuance of an incidental take permit covering those operations under CEQA. That case is currently pending in the Superior Court for Fresno County.[215] NCMWC's case against CDFW and DWR would not affect the validity of its Settlement Contract, but a decision in its favor could assist USBR in complying with its obligations under federal and state law, and thus in performing its obligations under the Settlement Contract.

## 6.3 Water Deliveries Under the WSA

According to the WSA, NCMWC would make surface water from the Sacramento River available to Sutter Pointe based on ownership of shares in NCMWC by the owners of certain lands within Sutter Pointe. When urban developers purchased lands within Sutter Pointe that had appurtenant shares, they would thereby become shareholders and entitled to the delivery of water.

[210] Natural Resources Defense Council v. Bernhardt (2019), pp. 65-67.
[211] Natural Resources Defense Council v. Bernhardt (2020), p. 14.
[212] Pacific Coast Federation of Fishermen's Associations v. Ross (February 24, 2020).
[213] California Natural Resources Agency v. Ross (2020).
[214] Pacific Coast Federation of Fishermen's Associations v. Ross (June 24, 2020).
[215] Tehama-Colusa Canal Authority v. California Department of Water Resources (2020).

As a general rule, the right to receive water from a mutual water company is based on ownership of shares in the company.[216] There is no mandatory method by which a mutual water company must allocate water between its shareholders, and any reasonable method may be established in its corporate documents.[217] For NCMWC, water is allocated to each shareholder based on the number of shares owned by that shareholder, compared to the number of shares owned by all shareholders that desire to be supplied with water during the same period of time.[218]

The WSA quantified the interest of Sutter Pointe in NCMWC water supplies in three potential ways:

- NCMWC Shares: Sutter Pointe would be entitled to 13,926 AFY based on the proportion of Sutter Pointe lands compared to all shareholder lands (15.83 percent), multiplied by average historical diversions by NCMWC of approximately 88,000 AFY from the Sacramento River;
- Historical Diversions: Sutter Pointe would be entitled to approximately 22,000 AFY based on the proportion of agricultural water demands of the Sutter Pointe lands compared to all shareholder lands (25 percent), multiplied by average historical diversions of approximately 88,000 AFY from the Sacramento River; or
- Historical Use: Sutter Pointe would be entitled to approximately 30,000 AFY based on historical deliveries to those lands.[219]

None of those methods of quantification still applies for purposes of this Supplement. As explained in Section 6.4, GSWC has executed an agreement with NCMWC regarding the delivery of surface water by NCMWC to GSWC for urban use at Sutter Pointe.

## 6.4 Water Wholesale Agreement

GSWC and NCMWC entered into a Water Wholesale Agreement on March 14, 2011. Pursuant to that contract, NCMWC will deliver up to 19,500 AFY of surface water from the Sacramento River to GSWC in perpetuity.[220] The water will be diverted from the Sacramento River by NCMWC using its existing Sankey Pumping Plant and delivered to GSWC at that location. GSWC will construct a raw water pipeline from the Sankey Pumping Plant to a surface water treatment plant to be constructed at a location to be determined based on phasing of Sutter Pointe lands and hydraulic design of the water distribution system.

In addition to the annual limitation of 19,500 AFY that GSWC may purchase, the Water Wholesale Agreement also includes monthly limitations, as shown in Figure 37. Like the entitlements of NCMWC from USBR pursuant to the Settlement Contract, the Water Wholesale Agreement includes a firm amount, equal to 14,950 AFY, and a non-firm amount that is not available during critical years, equal to an additional 4,550 AFY. As described in Section 6.2.4, the NCMWC entitlements under its Settlement Contract may be reduced by 25 percent in critical years, while the Water Wholesale Agreement only reduces the supply available to GSWC by 23.3 percent in those years on an annual basis. Unlike in the Settlement Contract, under the Water Wholesale Agreement the percentage reduction varies by month. Larger reductions apply during April and May (when NCMWC supplies water to its shareholders for rice field flooding) and November (when NCMWC supplies water for rice decomposition), and smaller reductions apply during other months.

[216] Natomas Central Mutual Water Company (1998), Art. IV, § 2.
[217] De Boni Corporation v. Del Norte Water Company (2011), p. 1170.
[218] Natomas Central Mutual Water Company (1998), Art. XII, § 7.
[219] Tully & Young (2008), pp. 21-23.
[220] Water Wholesale Agreement (2011).

**Figure 37. Monthly entitlements under Water Wholesale Agreement**

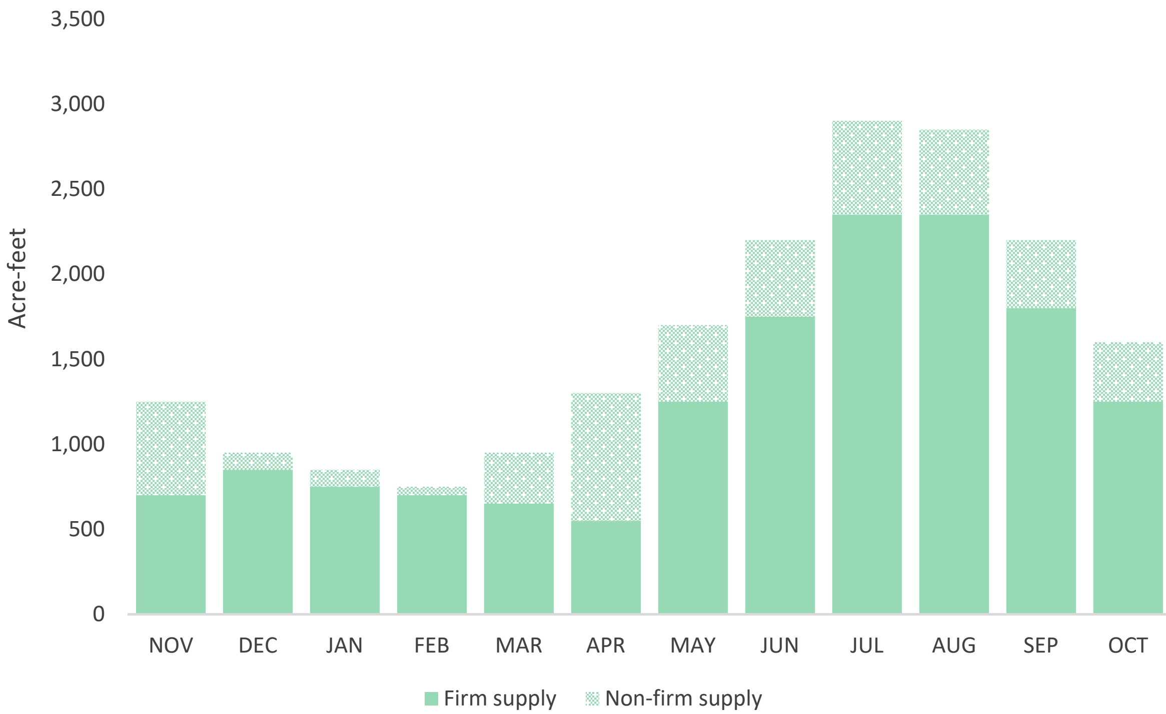
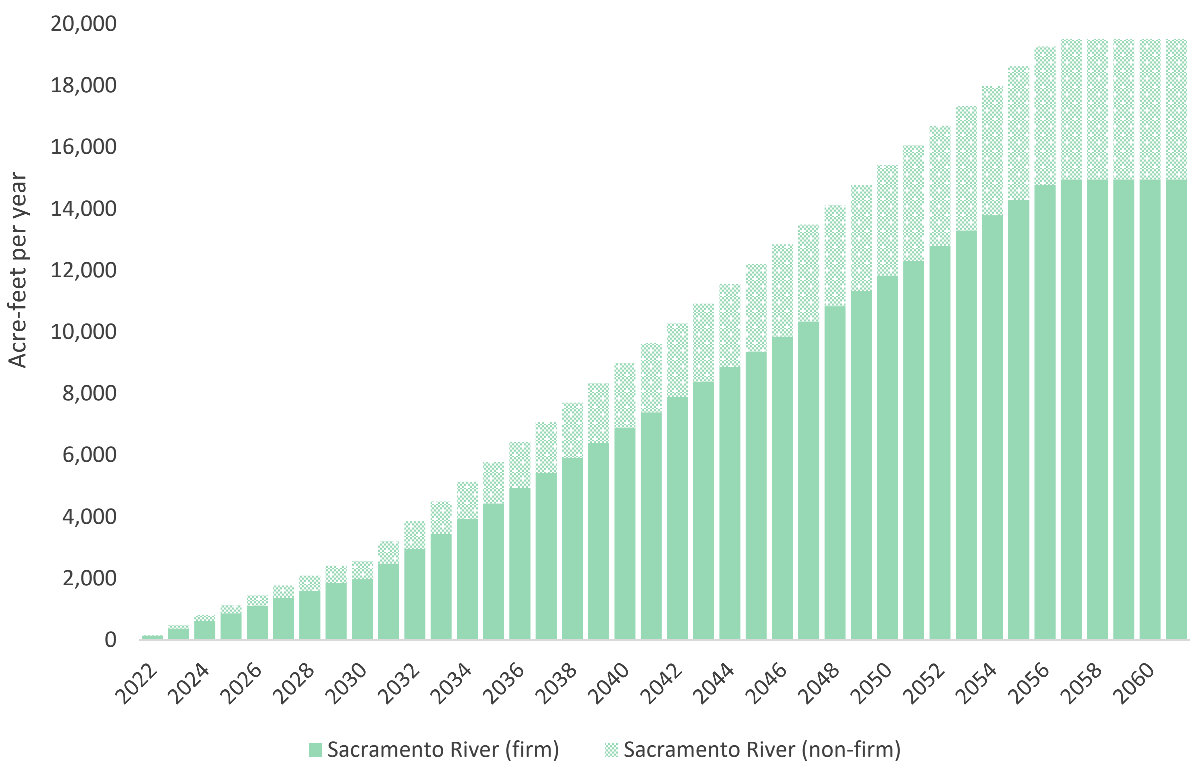


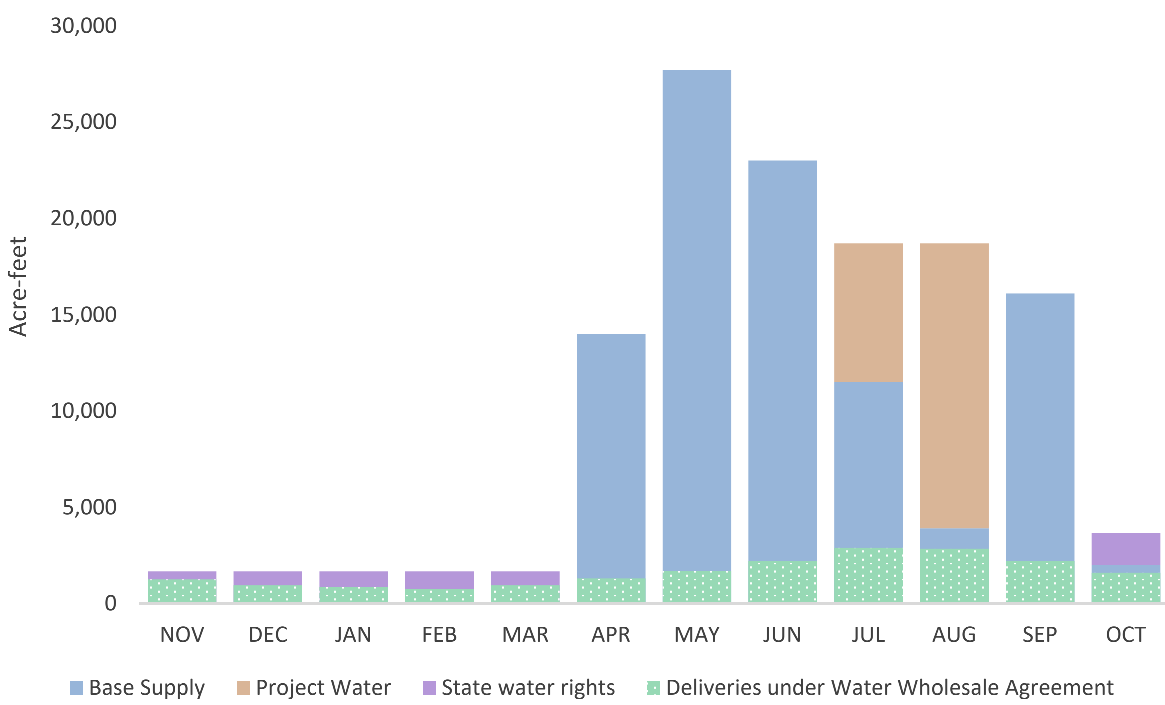

**Figure 38. Growth in water entitlement under Water Wholesale Agreement**



The entitlement amount of 19,500 AFY is based upon Sutter Pointe at buildout, and during the development period, the maximum amount of water to which GSWC is entitled will be based on the proportion of development units which have been developed at that time. For purposes of this Supplement, it is assumed that Sutter Pointe will be developed in two phases: first, the Project will be developed at a rate of 500 units per year, starting in mid-2022 and ending in mid-2030; second, the remainder of Sutter Pointe will be developed starting in 2031 at a rate of 1,000 units per year until completion in 2057. The timing of development may change, but water supplies will increase based on the same factor as water demands, so absolute timing is not critical. The planned growth of Sacramento River water supplies available to GSWC under the Water Wholesale Agreement are shown in Figure 38 for the first 40 years of development from 2022 through 2061.

It may be useful to compare the water to be delivered to GSWC under the Water Wholesale Agreement to the total quantities of water available to NCMWC under its entitlements. Figure 39 overlays maximum monthly deliveries under the Water Wholesale Agreement (as depicted in Figure 37) onto the water entitlements of NCMWC (as depicted in Figure 34). NCMWC will transfer to GSWC a substantial portion of its water supplies available during the non-irrigation months of October through March. During the irrigation season from April through September, however, deliveries to GSWC will make up a relatively small proportion of the water supplies available to NCMWC. The remainder of those supplies will be used by NCMWC to deliver irrigation water to its shareholders for agricultural and habitat purposes. In all months, NCMWC has sufficient legal entitlement to water to deliver water to GSWC pursuant to the Water Wholesale Agreement.

**Figure 39. Comparison of Water Wholesale Agreement and NCMWC entitlements**




## 6.5 Regulatory Approvals

As described in Sections 6.2.3 and 6.2.4, the NCMWC water entitlements allow that company to divert and use water for agricultural purposes, other than the use of up to 10,000 AFY for municipal purposes at Sacramento International Airport and Metro Air Park. In order for NCMWC to deliver water to GSWC pursuant to the Water Wholesale Agreement, NCMWC will need to gain the approvals of the SWRCB and USBR for the change in purpose of use. The WSA identified these approvals as necessary for Sutter Pointe to receive water under all three alternative water supply programs.[221]

Both the SWRCB and USBR are aware of the changes of land use in the Natomas Basin, and both have acknowledged that those changes will require the conversion of water under NCMWC's entitlements from agricultural to urban uses. The change in purpose of use will not adversely affect other users of water from the Sacramento River, because all diversions would be within the amounts historically diverted by NCMWC and would occur at NCMWC's existing Sankey Diversion Pumping Plant. Therefore, it is likely that NCMWC can obtain approvals from both the SWRCB and USBR to implement the Water Wholesale Agreement for the benefit of GSWC and Sutter Pointe.

The WSA also considered the possibility of the water purveyor for Sutter Pointe applying for a new winter water right from the SWRCB under the Alternative B Water Supply Program. Since preparation of the WSA, GSWC has secured access to surface water supplies from NCMWC pursuant to the Water Wholesale Agreement, including water in the winter months. Therefore, it does not now appear that a new water right will be needed for GSWC to access water from the Sacramento River. The process for obtaining approval from the SWRCB for a new winter water right is likely to be substantially similar to that for changing NCMWC's existing water rights,[222] and the analysis required for issuance of such a right would be substantially similar. This Supplement agrees with the conclusion of the WSA that it would be likely that GSWC could obtain such a right, if it proved necessary or convenient.

Regulatory approvals are likely to take at least five years to process before the SWRCB and USBR. Because the WSA and this Supplement do not plan for use of surface water during the first phase of Sutter Pointe, those approvals are not required for the Project, and would only be required for post-Project development, which is not anticipated to begin until 2031 at the soonest. GSWC will begin the approval processes before the SWRCB and USBR after initiation of water service to the Project in 2022, which will allow GSWC at least eight years to complete those processes before surface water from the Sacramento River would be needed to serve later phases of Sutter Pointe.

## 6.6 Conclusions

Based on the analysis above, it is expected that the use of surface water for Sutter Pointe will have the following features:

- GSWC will not use surface water from the Sacramento River to supply the Project. As described in Section 5, all water demands of the Project will be satisfied using groundwater from the Subbasin.
- NCMWC has held rights to divert and use surface water from the Sacramento River for over 100 years. Those rights have been recognized by the SWRCB through the issuance of seven water right permits, and by USBR through execution of a Settlement Contract for delivery of water to NCMWC by facilities of the Central Valley Project. NCMWC and its predecessors have diverted water pursuant to those rights for over 100 years, and distributed that water to their shareholders in the Natomas Basin for beneficial agricultural and habitat uses.
- GSWC has executed the Water Wholesale Agreement with NCMWC, under which NCMWC will deliver up to 19,500 AFY in two tranches: a firm supply of 14,950 AFY that will be available in all years; and a non-firm supply of 4,550 AFY that will be available in years that are not classified as critical. Over the past 40 years, 12.5 percent of years have been classified as critical, but this Supplement does not rely

[221] Cal. Water Code §§ 1700 *et seq*.; Tully & Young (2008), pp. 27-28.
[222] California State Water Resources Control Board (1983) (finding that new appropriations may be permitted other than between June 15 and August 31 of each year).

on any particular occurrence of that condition, since all water demands for Sutter Pointe can be satisfied by the firm supply in conjunction with groundwater.

- NCMWC will need regulatory approvals from the SWRCB and USBR to transfer water to GSWC under the Water Wholesale Agreement, and it is likely that those approvals can be obtained. Both the SWRCB and USBR have acknowledged that those approvals will be needed in future to accommodate expected conversion of lands in the Natomas Basin from agricultural to urban uses. NCMWC and GSWC will initiate the process for the SWRCB and USBR approvals once occupancy begins at the Project, so that the approvals can be obtained before surface water from the Sacramento River is needed to serve post-Project water demands of Sutter Pointe.

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# Section 7 Assessment of Water Supplies

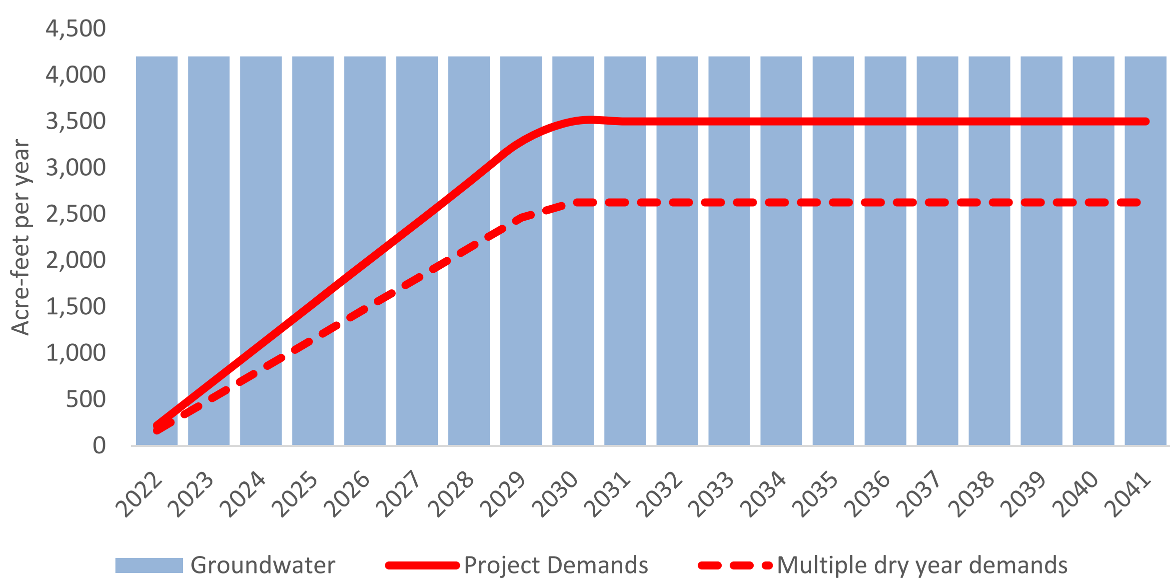
## 7.1 Water Supplies for the Project

As described in Section 4 of this Supplement, water demands of the Project are anticipated to be approximately 3,500 AFY, phased in between 2022 and 2030. During multiple dry years, those demands are expected to fall by approximately 25 percent each year, to 2,625 AFY at buildout.

As set forth in Section 5, the Project will be supplied with groundwater from the Subbasin that underlies the Project site. Historical use of groundwater on Project lands for agricultural cultivation has been approximately 4,200 AFY, and groundwater has been the exclusive source of water supplies to meet agricultural demands. Production and use of groundwater at 4,200 AFY has not produced undesirable results, including chronic lowering of groundwater levels, reduction of groundwater storage, degraded water quality, land subsidence or depletion of interconnected surface waters. There is no substantial reason to believe that extraction of groundwater in a similar quantity to serve the Project would cause any undesirable result or injure any other user of groundwater. Based on the analysis in the WSA and this Supplement, it is anticipated that 4,200 AFY of groundwater from the Subbasin will be available to supply the Project in all hydrologic year categories (normal, single dry and multiple dry).

Figure 40 compares water supplies and demands for the Project. As depicted in that figure, water supplies will exceed demands for the Project in every year for the 20-year planning horizon. In normal and single dry water years, water supplies will exceed demands by approximately 700 AFY, and demands will use only approximately 83 percent of the available groundwater supply. In multiple dry water years, when residents and businesses within the Project are expected to implement water conservation measures, water supplies will exceed demands by approximately 1,575 AFY, and demands will use only approximately 63 percent of the available groundwater supply.

**Figure 40. Comparison of water supplies and demands for the Project, 2022-2041**



This Supplement concludes that the total projected water supplies available to GSWC during normal, single dry and multiple dry water years during a 20-year projection will meet the projected water demand associated with the Project.[223] In addition, the Project will not adversely affect the availability of groundwater for any other use, including agriculture, or cause or contribute to any undesirable result under SGMA.

## 7.2 Water Supplies for Sutter Pointe

As described in the WSA and Section 3.2 of this Supplement, water demands of the entire Sutter Pointe project are anticipated to be approximately 25,200 AFY. For purposes of this Supplement, it is assumed that those demands will be phased in as for the Project between 2022 and 2030, and at a constant rate to reach the remainder of water demands between 2031 and 2057, when buildout would be achieved. The actual growth of demands will depend on phasing of the Sutter Pointe development, but the assumptions used in this Supplement accurately assess the manner in which water supplies will be available. During multiple dry years, demands are expected to fall by approximately 25 percent each year, to 18,900 AFY at buildout.

As set forth in Section 5, Sutter Pointe will be supplied with groundwater from the Subbasin that underlies the Sutter Pointe site. During development of the Project, groundwater supplies will be limited to 4,200 AFY based on historical use of groundwater on the Project site. Once development of Sutter Pointe proceeds beyond the Project, groundwater supplies would be increased to 13,075 AFY, which is the quantity evaluated in the WSA. According to the analysis by LSCE (2008), that quantity of groundwater production will be available without creating any undesirable results in the North American Subbasin or injuring any other user of groundwater. Based on that analysis, and the analysis in the WSA and this Supplement, it is anticipated that 13,075 AFY of groundwater from the Subbasin will be available to supply Sutter Pointe in all hydrologic year categories (normal, single dry and multiple dry).

As described in Section 6, Sutter Pointe will also be supplied with surface water from the Sacramento River once development proceeds beyond the Project. GSWC has an entitlement to 19,500 AFY of surface water based on the Water Wholesale Agreement with NCMWC. NCMWC has water rights dating back over 100 years, with water deliveries guaranteed by USBR through the Central Valley Project. Pursuant to the Settlement Agreement between USBR and NCMWC and the Water Wholesale Agreement between NCMWC and GSWC, water deliveries are guaranteed in two tranches: a firm quantity of 14,950 AFY, which is available under all hydrologic conditions; and a non-firm quantity representing the remaining 4,550 AFY, which is available in all but critical dry years. During the development period, GSWC will be entitled to increasing amounts of surface water, based on the number of EDUs being provided with water service. At the beginning of Sutter Pointe development beyond the Project, GSWC will be entitled to approximately 3,200 AFY from NCMWC (2,450 AFY firm and 750 AFY non-firm), and that amount will increase until it reaches 19,500 AFY at buildout (14,950 AFY firm and 4,550 AFY non-firm).

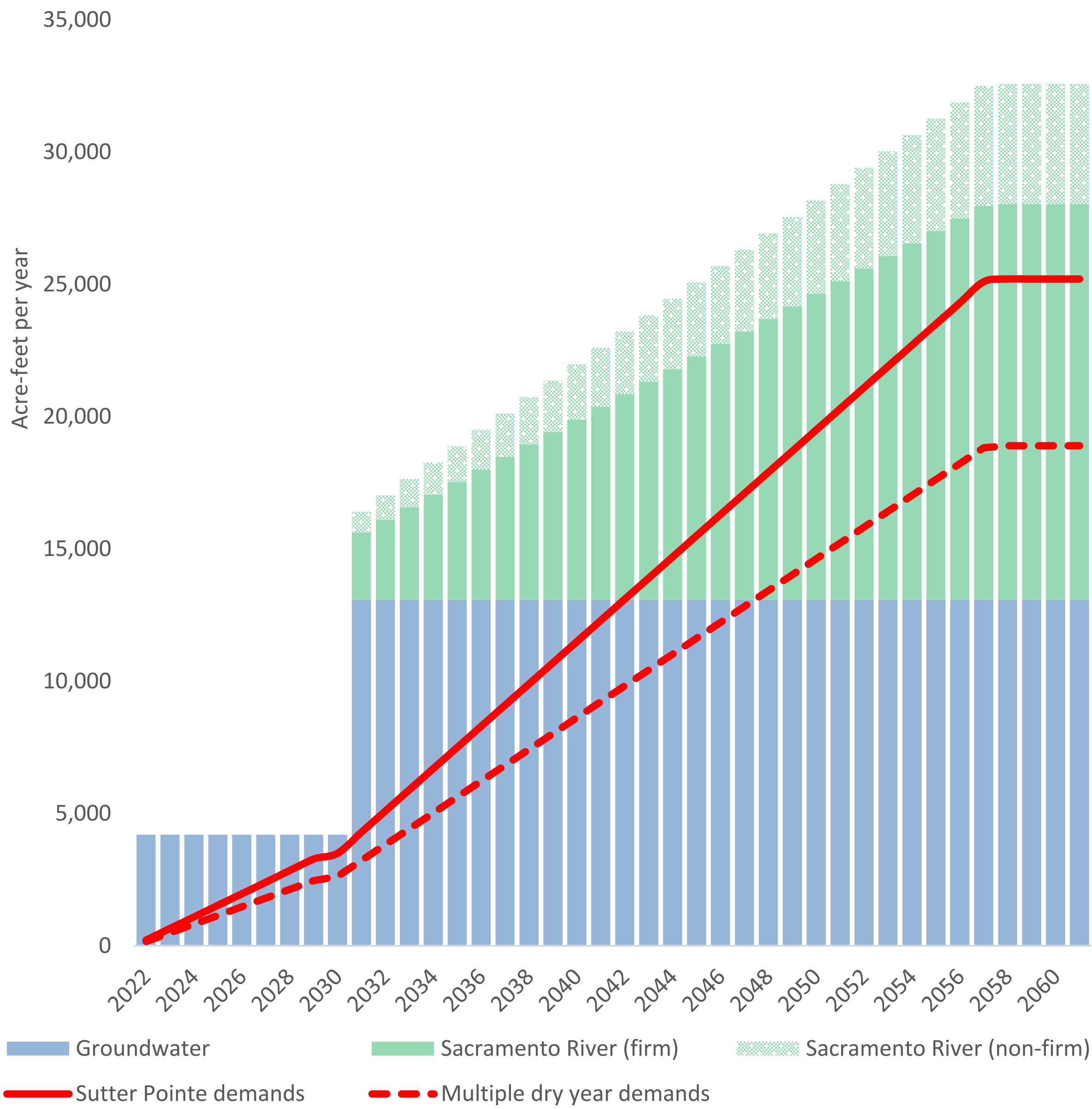
Figure 41 compares water supplies and demands for Sutter Pointe. As depicted in that figure, water supplies will exceed demands in every year through 2061, a 40-year planning horizon. At buildout in normal years, water supplies will exceed demands by approximately 7,375 AFY, and demands will use only approximately 77 percent of available groundwater and surface water supplies. Having groundwater and surface water available in those quantities will allow GSWC to strategically coordinate those supplies for the benefit of the development and long-term regional water planning efforts.

[223] See Cal. Water Code § 10910(c)(3). Note that the Project is not expected to include any agricultural or manufacturing demands. All agricultural demands in the area will be met by NCMWC. Since a new public water system will be constructed for the Project, GSWC will not have pre-existing water demands.

In single dry years, this Supplement assumes that water demands will remain equal to normal years, groundwater supplies will be fully available, and surface water supplies will be reduced to the firm quantity. At buildout under those conditions, water supplies will exceed demands by approximately 2,825 AFY, and demands will use approximately 90 percent of available supplies.

In multiple dry years, this Supplement assumes that water demands will be reduced by 25 percent in response to water conservation measures, groundwater supplies will be fully available, and surface water supplies will be reduced to the firm quantity. In other words, water supplies in multiple dry years will be the same as in single dry years, but water demands will be reduced. At buildout under those conditions, water supplies will exceed demands by approximately 9,125 AFY, and demands will use approximately 67 percent of available supplies.

**Figure 41. Comparison of water supplies and demands for Sutter Pointe, 2022-2061**



This Supplement concludes that the total projected water supplies available to GSWC during normal, single dry and multiple dry water years during a 40-year projection will meet the projected water demand associated with Sutter Pointe, in addition to GSWC's then-existing demands of the Project, including manufacturing uses.[224] Meeting the water demands of Sutter Pointe will not adversely affect the availability of water for any other use, including agriculture, and will not cause or contribute to any undesirable result for groundwater in the Subbasin under SGMA.

[224] See Cal. Water Code § 10910(c)(3). Note that Sutter Pointe is not expected to include any agricultural demands, as all such demands will be met by NCMWC.

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