IMPROVEMENT DISTRICT NO. 4
REPORT ON WATER CONDITIONS 2019

January 31, 2020

Board of Directors
Kern County Water Agency
P. O. Box 58
Bakersfield, CA 93302-0058

Dear Members of the Board:

The *Improvement District No. 4 2019 Report on Water Conditions*, prepared as required by section 14.25 of the Kern County Water Agency (Agency) Act, is herewith filed with the Agency's Secretary of the Board of Directors (Board). This is the 47th in a series required for the setting of groundwater charges for funding operating costs of Improvement District No. 4 (ID4) project facilities.

This report describes surface and groundwater conditions for ID4 and includes estimates of water supplies and requirements for the Water Year July 1, 2020 through June 30, 2021.

Also included is an operating cost projection through 2020. This projection and the recommendations indicate the desirability of establishing a groundwater charge for the 2020-21 water year. The information for setting this charge is contained in this report and is recommended for consideration at the public hearing to be held on Monday, March 16, 2020 at 3:00 p.m. in the Stuart T. Pyle Water Resources Center Board Room, located at 3200 Rio Mirada Drive, Bakersfield, California.

Respectfully submitted,

Martin M. Varga, P. E.

I hereby acknowledge receipt of the *Improvement District No. 4 2019 Report on Water Conditions* and will make it available for examination by the public.

Secretary of the Board

Enclosure

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Improvement District No. 4

of the Kern County Water Agency

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2019 Urban Bakersfield Advisory Committee -

The Urban Bakersfield Advisory committee (UBAC) is charged with making recommendations to the Kern County Water Agency (Agency) Board of Directors (Board) on the Improvement District No. 4 (ID4) budget, water supply and water quality plans, and use of ID4 facilities. UBAC consists of nine members and nine alternate members appointed by the Agency Board.

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Definitions

Acre-Foot (af) - The quantity of water required to cover one acre of land to a depth of one foot (325,851 gallons).

Agency - Kern County Water Agency.

Agricultural Water - Water first used on land in the production of crops or livestock for market.

Aquifer - Porous water-bearing stratum or zone below the Earth's surface.

Central Valley Project - In Kern County, this refers to the Friant-Kern Canal and its service area.

Customers - Based on the new treated water contracts.

DWR - California Department of Water Resources.

Enterprise Fund - General operating fund used to fund ID4 operations.

Groundwater Replenishment - Any act of God or man that replenishes or adds water to the subsurface aquifer system.

ID4 - Improvement District No. 4.

MCL - Maximum Contaminant Level - The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste and appearance of drinking water.

MCLG - Maximum Contaminant Level Goal.

MGD - Million gallons per day.

M&I - Municipal and Industrial - Generally refers to water used for domestic purposes.

PHG - Public Health Goal - The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Potable Water - Water fit to drink pursuant to State and federal statutory requirements and aesthetic acceptability.

Project Water - Any combination of State Water Project water and additional water generated from the State Water Project, or from exchanges with Kern River interests or other sources.

Purveyor - Company or organization that provides a domestic water supply to a group of water users on a retail basis.

Small Groundwater-Producing Facility - Facility that has a discharge opening not greater than two (2) inches in diameter and does not provide water for an area in excess of 10,000 square feet.

SWP - State Water Project - In Kern County, its major feature is the Edmund G. Brown California Aqueduct.

Table A - The amount of water from the State Water Project allocated to ID4, according to the Agency's contract with the California Department of Water Resources.

TWCEP - Treated Water Capacity Expansion Project.

Very Small Groundwater-Producing Facility - Facility where, in the opinion of ID4 staff, the cost of collection would exceed the flat rate charge.

Water Year - The water year as referenced within this report refers to the first day of January through the end of December.

Summary & Recommendations

Based on the information compiled and presented herein, it has been determined that the amount of agricultural water withdrawn from the groundwater supplies of Improvement District No. 4 (ID4) for the year 2019 is estimated to be 379 acre-feet (af). The estimated amount of all other non-agricultural water withdrawn from the groundwater supplies of ID4 for the 2019 calendar year is 61,791 af (Table 6). 40,756 af (including Henry C. Garnett Water Purification Plant process) of treated surface water was delivered to water purveyors within ID4 during water year 2019 (Table 3). The Kern County Water Agency (Agency), on behalf of ID4, was obligated by contract to pay for 82,946 af of State Water Project (SWP) water in calendar year 2019 (Table 5). If the 2020 California Department of Water Resources (DWR) SWP allocation remains at 15 percent, Agency staff estimates that 12,442 af of water will be imported into ID4. Approximately 5,599 af of this water will be recharged as conveyance losses in delivering raw surface water to the Henry C. Garnett Water Purification Plant.

Agency staff developed a reserve policy to identify appropriate levels of accumulation within the ID4 Enterprise Fund. The 2019-20 treated water rate is set at $173 per af. Total fund accumulation in the Enterprise Fund was $6.2 million as of July 1, 2019 and is projected to be $5.7 million as of July 1, 2020. The total fund accumulation includes recommended reserve levels as summarized below.

Reserve Designation	Balance
Acquisition of Additional Water	$1,000,000
CVC Power Rate Stabilization	$500,000
Capital Replacement	$1,500,000
Catastrophe	$2,000,000
Groundwater Banking	$500,000

It is recommended that charges for groundwater production in ID4, for the fiscal year commencing July 1, 2020 and ending June 30, 2021, be levied as follows:

1. Agricultural groundwater production: $19 per af

2. All other groundwater production: $38 per af

3. Small groundwater-producing facilities: $38 (flat rate)

4. Very small groundwater-producing facilities: $0 (no charge)

For administrative convenience, a flat rate annual charge of $38 was levied for small groundwater-producing facilities, and no charge was levied for very small groundwater-producing facilities where the cost of collection would exceed the flat rate charge.

Purpose

This is the 47th in a series of annual reports on water conditions within ID4. This report is intended to provide information upon which the levying of groundwater charges for Fiscal Year 2020-21 is based. The first report, issued on October 1, 1973, detailed events leading to the formation of ID4 and formulation of a project plan for importing water from the California Aqueduct. Appended to the first ID4 report on water conditions are the full texts of the formation resolution and a resolution declaring an intention to establish groundwater charges within ID4. Appended to the 1993 report are two resolutions that amended the formation of ID4 (prior Resolution No. 17-71) by raising the maximum permissible groundwater charge to $40 per af, thereby raising the cost of treated water to a maximum level of $38 in excess of the maximum groundwater charge levied in a given year. These actions were superseded when the Agency Board of Directors (Board) adopted the ID4 Financial Management Plan in March 1999. The Board adopted the Revised ID4 Financial Management Plan (Revised Financial Plan) in January 2011, which updated the financial requirements and reserve policy of ID4 as a result of the Treated Water Capacity Expansion Project (TWCEP). In April 2016, the Revised Financial Plan was updated again.

In December 1972, the Agency published a Notice of Intent to establish a groundwater charge in accordance with section 14.22 of the Agency Act 9098 (Act). Following the Act, as amended February 17, 1982, requires that [such notice]:

> All water-producing facilities (wells) located within ID4 shall be registered with the Agency by the owner or operator.
>
> The Agency Engineer shall prepare an annual report by February 1 of each year.
>
> A public hearing shall be held on the third Monday in March regarding the Engineer's report and to receive public testimony thereon.
>
> Within 30 days after the close of the hearing, the Board shall determine whether a groundwater charge will be levied, and if so, shall set the charge.
>
> Each owner or operator of a well shall file with the Agency, on or before January 31 and July 31 of each year, a statement of total water production for the preceding six months, and shall pay the groundwater charges as determined on the water production statement.

The Act requires a projection of estimates of water conditions and requirements for fiscal years commencing July 1. SWP operations are based on a calendar year. Local hydrologic conditions have a substantial impact on the ability of ID4 to receive and spread its SWP Table A water. Therefore, this report presents hydrologic and operational histories for back-to-back calendar years for use in projecting fiscal year supplies and requirements as required by the Act. Plate 1 identifies irrigated agriculture,

municipal and industrial (M&I) areas determined via April 2018 aerial imagery of Kern County. Table 9 lists the acreage devoted to each land use classification within ID4 since 1972.

History of ID4

General

ID4 was formed by a resolution adopted by the Agency Board on December 21, 1971 to provide a supplemental water supply for portions of the urban Bakersfield area through the importation of water from the SWP. In order to have a means for transporting this supplemental water to ID4 from the California Aqueduct, the ID4 project included ID4's participation in the Cross Valley Canal (CVC). Upon reaching ID4, the imported supply was to be delivered directly to recharge areas for direct replenishment of the underlying groundwater aquifer or to the Henry C. Garnett Water Purification Plant for treatment and delivery to in-district water purveyors.

Creation of ID4

The Agency was formed by Chapter 1003 of the Statutes of 1961. The primary purpose for creating the Agency was the establishment of a single entity in Kern County to negotiate and administer a water supply contract with the State of California for its SWP. In November 1963, to provide a firm water supply to supplement the estimated safe yield of the underground basin, the Agency contracted with DWR for a water supply for member units within Kern County, which included 77,000 af annually for ID4.

Subsequent amendments to the Act added provisions for the formation of improvement districts as needed to expedite solutions to specific problems relating to flood control, drainage or water supply. Activities leading to the creation of ID4 were initiated by the Agency Board by adoption of Resolution No. 25-70 on December 10, 1970, which outlined the need for such an improvement district. ID4 was formed by a resolution adopted by the Agency Board on December 21, 1971 for the purpose of financing the construction of a water purification plant, related water conveyance facilities and a portion of the cost of the CVC. Resolution Nos. 16-71 and 17-71 were adopted by the Agency Board on December 21, 1971 to finalize formation activity and establish the boundaries of ID4 as they exist today. On September 12, 1972, an election was held within ID4 authorizing $17.5 million of general obligation bonds to construct ID4's share of the CVC and water purification facilities, making the contracted water supply available to the areas of need within ID4. Five water districts in the easterly portion of the San Joaquin Valley in Kern County shared in the construction of the CVC to convey their water to their respective districts.

Historic Conditions

Prior to construction of the CVC, the primary water supply for all uses within ID4 was groundwater. The groundwater basin underlying ID4 receives its recharge from the Kern River, which traverses ID4 from east to west, a distance of about 12 miles, through a wide, flat, permeable bed. Historically, flood flows that overflowed on lands on both sides of the river contributed further to groundwater recharge. Seepage and percolation through a number of unlined canals provided another source of recharge.

In the 1860s, when the first settlers arrived in Bakersfield, water levels were close to the surface. These levels declined from 40 to 90 feet by the 1940s and pumping lifts of 100 feet or more were common. Due to the declining water table, the quality of the groundwater in portions of ID4 degraded as poorer quality water moved into the area from adjacent lands.

Section 14.25 of the Act requires that, "... the Agency Engineer shall annually prepare a report which shall include, among other matters which the Agency may desire, information on the availability of surface and groundwater in the improvement district, the quantity of water needed for surface delivery and for replenishment of the groundwater supplies within the improvement district for the ensuing water year, the amount of water which the Agency is obligated to purchase for use in the improvement district during the ensuing water year and an estimate of the amount of groundwater to be extracted within the improvement district during the ensuing water year."

This report addresses establishing a groundwater charge for the fiscal year commencing July 1, 2020. However, the SWP operates on a calendar year basis. Water orders and payments for water are on the calendar year. Collection of tax funds by the County of Kern (County) and Agency bookkeeping are on a fiscal year basis. For this reason, many of the comparisons cited in this report refer to calendar year 2020, which overlaps the 2020-21 fiscal year.

Water Supply & Requirements

Availability of Surface Water and Groundwater

The annual surface water supply for ID4 includes a SWP Table A allocation of 77,000 af of M&I water and 5,946 af of firm agricultural water supplies for a total of 82,946 af. The annual Table A allocation received from the SWP is subject to reduction during drought conditions and regulatory requirements for environmental protection. Unless additional facilities are constructed to increase the SWP reliability, Table A allocation reductions will occur more frequently in future years.

The Board recognized the need for advanced planning to meet the water demand of a growing community and adopted Resolution No. 13-83 on June 23, 1983, stating that the Agency will do everything in its

power to provide the urban Bakersfield area additional potable surface water supplies. The Agency completed studies to determine the timing and extent of needs for such additional potable water supplies and the best way to meet these needs. Resolution No. 21-93, adopted on May 27, 1993, established policy for meeting future water supply requirements of ID4 and the joint City/County 2010 General Plan Area.

On May 26, 1988, the Board adopted Resolution No. 12-88 allocating to ID4 10,276 af of firm agricultural water and 1,554 af of surplus agricultural water. This resolution provides 35 cubic feet per second (cfs) of additional flow capacity in the California Aqueduct through Reach 16 to the forebay of the A.D. Edmonston Pumping Plant. This water had been previously contracted to Wheeler Ridge-Maricopa Water Storage District.

In 1996, the Kern Water Bank property was transferred to the entities participating in the Kern Water Bank Authority. As payment for its share of the Kern Water Bank, ID4 returned 4,330 af of its SWP firm agricultural Table A allocation to DWR. This reduction is reflected in current ID4 SWP Table A amounts.

On March 30, 2016, in response to the Sustainable Groundwater Management Act (SGMA) ID4 executed the Memorandum of Understanding to form the Kern River Groundwater Sustainability Agency (Kern River GSA) with the City of Bakersfield and Kern Delta Water District. The Kern River GSA has prepared a Groundwater Sustainability Plan (GSP) to cooperatively manage shared groundwater resources in a sustainable manner. The GSP is being submitted in January 2020 in coordination with four additional GSPs that collectively cover the entire Kern County Subbasin, the largest groundwater subbasin in California. The Kern River GSA GSP Plan Area covers 361 square miles, about 13 percent of the 2,834-mile Subbasin and will be cooperatively managed by Kern River GSA member agencies. Local surface water from the Kern River, imported water from the State Water Project (SWP), recycled water, and other surface water sources will be used to support beneficial uses. These surface water sources are supplemented by groundwater and managed conjunctively throughout the Plan Area.

On October 10, 2017, the Urban Bakersfield Advisory Committee (UBAC) expressed support to the Agency Board that ID4 continue to participate in California WaterFix planning and design activities.

Other supplies utilized to maximize replenishment operations in normal to wet years include interruptible water from the SWP (Article 21 water), water that is surplus to the Central Valley Project, water available from the Friant-Kern Canal and Kern River water. The amounts of 2019 SWP Table A water received are shown in Table 1, together with adjustments for exchanges and purchases. Actual historic deliveries are

shown in Table 5. ID4 actively negotiates exchanges with Kern River interests for a supply of Kern River water.

Kern River supplies are delivered to agricultural water users in areas served by the City and Kern Delta Water District (Kern Delta) within ID4. Most of these agricultural service areas have dual supply systems allowing for the use of groundwater in dry years and Kern River water in wet years. The City and Kern Delta supplied 2,801 af of Kern River water for agricultural use within ID4 in 2019.

Treated municipal effluent irrigates agricultural land in the southeast area of ID4. City and County sewage treatment plants in the southeast portion of ID4 treat and process wastewater, which is applied to agricultural areas south of Brundage Lane and east of Cottonwood Road.

Water Needed for Surface Delivery and Groundwater Replenishment

In 2020, ID4 needs about 49,500 af for direct deliveries to the purveyors, with an additional 25,000 af for internal purification plant processing and canal losses to allow for a maximum, non-interruptible supply to the Henry C. Garnett Water Purification Plant. Water needed for surface delivery will be SWP water contracted for by the Agency on behalf of ID4 as described earlier in this report, and/or Kern River water obtained by purchase or exchange and/or water recovered from ID4's banking projects to augment surface supplies.

SWP Table A water supplies not required for the Henry C. Garnett Water Purification Plant are normally utilized for groundwater replenishment. As of January 2020, the Kern River watershed is projected to be about 93 percent of normal. SWP supplies are projected to be at least 15 percent of SWP Table A water amounts, which results in an allocation to ID4 of 8,295 af. This supply is insufficient for full deliveries from the Henry C. Garnett Water Purification Plant. Additional supplies will be recovered from various banking projects to fulfill demand. In the past, natural replenishment of the basin's groundwater supply derived primarily from Kern River flows. When a dry year follows a period of heavy replenishment, rapid declines in groundwater levels adjacent to the river are noted as mounds dissipate.

Water Obligated for Purchase by the Agency

The Agency was obligated to pay for 82,946 af on behalf of ID4 in 2019.

Groundwater Conditions

Data collected by Agency staff indicates an average increase in groundwater levels of 21 feet in 2019. In previous years, the change in groundwater levels has been calculated from contour maps generated from data collected in the fall (September through October). Comparing fall data can produce an erroneous interpretation in the calculation due to the large amount of groundwater extraction occurring in and

adjacent to ID4 during the time it was collected. A more accurate calculation may be made by comparing data from mid-winter through early spring (January through March), due to the decrease in groundwater demand (pumping). Calculating the change in groundwater levels using data collected in the spring was instituted in 2011 (see Figure 1).

The average depth is weighted to account for the non-uniform density of monitoring wells within three distinct areas of the groundwater service area of ID4. These three areas consist of the area approximately north of Rosedale Highway, the area approximately south of Stockdale Highway and the Kern River area. These three areas are considered separately due to varying groundwater recharge practices, different groundwater extraction demands and geological considerations with respect to the relative ease of subsurface migration of groundwater. Plate 6 and Plate 7 depict the elevation of water in wells and depth to water in wells, respectively.

Estimated Groundwater Extractions

Groundwater extraction is closely related to land use within ID4. Agency staff has conducted annual land use surveys since 1972. Data of historical land use within ID4 is shown in Table 9. The estimated amount of groundwater extracted in 2019 was 62,170 af (Table 6).

Groundwater Replenishment

ID4 provides a treated surface water supply to replace a portion of groundwater pumping. The replaced pumping, or in-lieu recharge, combined with imported SWP or exchanged Kern River water recharges the underground aquifer. Recharge made possible by water exchanges with Kern River interests commenced in 1971. Recharge using SWP water commenced in 1975 with the completion of the CVC. Actual amounts spread may vary from about 8,000 af of unavoidable seepage losses to over 90,000 af, depending on local and SWP water conditions and regulation afforded by exchanges.

Since 1971, ID4 has recharged 1,939,274 af. The SWP Table A water available for recharge or total in the same period was 968,429 af. The difference of 970,845 af was obtained from exchanges with Kern River or Friant-Kern Canal interests and banked water imports.

In-District recharge for 2019 was 43,358 af. The final SWP Table A water allocation was 75 percent and the Kern River runoff was 197 percent. (See Table 4 for detailed information.)

Operations

Banking

Kern Water Bank

ID4 has a 9.62 percent interest in the Kern Water Bank recharge and recovery facilities as a result of the 1996 agreement among project participants, the Agency and DWR. The number of recovery wells currently available is 91, yielding a total annual recovery capacity of approximately 180,000 af. The maximum annual recharge capacity of the project is about 600,000 af. ID4 recharged 14,758 af in the Kern Water Bank facilities in 2019.

Pioneer Project

ID4 has a 10 percent interest in the Agency-owned Pioneer Project recharge and recovery facilities as a result of the 1998 Pioneer Participation Agreement. The total number of completed wells on the project is 38, which yield a total annual recovery of approximately 100,000 af. The maximum annual recharge capacity of the project is about 250,000 af. ID4 recharged 1,797 af in the Pioneer Project facilities in 2019.

ID4 Recovery Program

ID4 currently owns four wells on the City's 2800 Acre Recharge Facility, located west of Allen Road and south of Stockdale Highway. These wells were drilled and cased in 1999 and remained idle during 2000 through 2002. In 2003, the project was completed with the installation of pumps, motors and pipelines. ID4's overall recovery capacity for this project is 20 cfs, or 12,000 af annually. ID4 recharged 2,035 af in the 2800 Acre Recharge Facility in 2019.

Allen Road Well Field Complex

ID4 owns and operates seven wells located along the north side of the Kern River between Allen Road and Coffee Road. ID4 can use the wells to enhance potential exchanges or for water quality benefits for the Henry C. Garnett Water Purification Plant. ID4 recharged 3,709 af in the vicinity of the Allen Road Well Field Complex in 2019.

Improvement District No. 4 - Rosedale-Rio Bravo Joint Use Recovery Program

The Rosedale and ID4 Joint Use Groundwater Recovery Program (JURP) facility includes seven recovery wells with a total capacity of 45 cfs. ID4 operates this well field to recover banked water for two of Rosedale's partners, Kern-Tulare Water District (Kern-Tulare) and Arvin-Edison Water Storage District, with a maximum annual recovery capacity of 21,000 af. The JURP Agreement also provides ID4 with

the ability to exchange surface water for an equal amount of banked water in the JURP area. In 2019, ID4 did not recover on behalf of Rosedale's banking partners.

Exchanges

Exchanges of SWP water for Kern River and Friant-Kern Canal water will typically improve the quality of raw water delivered to the Henry C. Garnett Water Purification Plant and water spread for replenishment of the groundwater aquifer. Also, there are savings to ID4 in reduced CVC pumping costs when the exchange entity can accept return of ID4 water in the California Aqueduct, or at locations west of the Henry C. Garnett Water Purification Plant. These power savings occur when ID4 does not have to pump the water easterly from the SWP through the seven lift stations on the CVC to bring it into ID4. The current power costs averaged for the year are $4.21 per af at pumping plants one through seven, resulting in a total average cost of approximately $29.50 per af when water is delivered the full distance from the California Aqueduct to the terminus of the CVC Extension. An activity table depicting exchange activity for 2019 is shown in Table 1.

In 2019, ID4 exchanged water with several entities to benefit all parties by saving costs, conserving supplies and keeping water quality consistent.

Summary of Water Supply Operations

The total amount of direct, in-lieu and Kern River recharge incidental to ID4 operations since 1971 is shown in Figure 1. This includes banking programs outside of ID4 boundaries, which also benefit ID4.

Total ID4 In-District Recharge (Direct Recharge)	1,939,274
Total Treated Water Supply (In-Lieu Recharge)	1,240,210
Subtotal of ID4 Project Recharge Activities	3,179,484
Incidental Canal & River Recharge	3,586,858
Total Recharge Within ID4	6,766,342
Total Reported Groundwater Production Within ID4	(3,553,426)
Net Balance for ID4 Project Duration	3,212,916

Units in acre-feet.

Education

ID4 has historically participated in funding a comprehensive Water Education Program to educate local students about Kern County's water supplies, the importance of water and water use efficiency. The goal of the Water Education Program is to provide the public with the opportunity to make informed decisions

when it comes to water use and conservation. The ID4 program incorporates teacher workshops, curriculum materials, assemblies, classroom presentations and student contests. All curricula and instruction offered through the Water Education Program support the Common Core Standards and Next Generation Science Standards for grades Kindergarten-12.

Water Education Program Components

Project WET - Project WET (Water Education for Teachers) promotes the awareness, appreciation, knowledge and stewardship of water resources. Project WET workshops maximize the time engaged in hands-on activities, help educators become familiar with teacher-designed features of the guide and provide opportunities to bounce implementation ideas around with fellow educators. Every Project WET activity was created by teachers, for teachers, and each incorporates nationally recognized education principles and practices. Project WET activities provide step-by-step instructions making the activities very popular with California educators of all levels of teaching experience. Project WET activities are correlated to Common Core Standards, Next Generation Science Standards and California Environmental Education Initiative learning objectives.

ID4 is proud to be a facilitator for Project WET, and annually hosts two Project WET Workshops and Practicum sessions. In the 2018-19 school year, 34 teachers from ID4's service area attended the Project WET teacher workshops. The workshops feature classroom-proven, hands-on learning activities that make water topics come alive for teachers and students. The Project WET activities that were presented during the workshops were specifically tailored to easily integrate knowledge of local water resources and to highlight local water issues. Each teacher received a new Project WET 2.0 Guide (Guide). The Guide features 65 Kindergarten-12th grade Project WET activities to enhance student application of curricular skills in math, language arts, science and history/ social science to the study of water. An additional feature of the Guide includes a website portal address that enables teachers to broaden their educational resources.

Teachers had the opportunity to register for continuing education units from California State University, San Marcos after their participation in the workshop and left with custom-made activity kits to use in their classrooms.

Water Awareness Poster Contest - Water Awareness Month is celebrated statewide in May, and ID4 celebrates the importance of water in the community by having students express how they can play a part in water conservation. As part of this commitment to water conservation, ID4 holds an annual poster contest for students in grades 1-6. In the 2019 poster contest, over 260 entries were received from 17

different schools within ID4's service area. From those entries, 12 winning posters were selected. The winners received an award of recognition and their posters are displayed on the Agency's website. First, second and third place winners were presented with awards during year-end assemblies.

Deputies of Water Conservation - As part of ID4's commitment to water education and conservation, Kindergarten through 6th grade classrooms that participate in ID4 water education programs are asked to join the 3,000-gallon Water Conservation Challenge. The Deputies of Water Conservation activity encourages students to conserve water at home and at school, and track their water savings on a classroom poster. Once a classroom reaches the goal of 3,000 gallons of water savings, the students are designated Deputies of Water Conservation. In the 2018-2019 school year, four classrooms within ID4's service area participated in this program.

5th Grade Water Cycle Presentation The Incredible Journey - This Project WET activity is conducted in the classroom. As part of the lesson, students role-play as a water molecule, which helps them to conceptualize the water cycle as more than a two-dimensional path. At the conclusion of the lesson, the students will have made a water cycle bracelet that describes their "Incredible Journey" as a water molecule. The objectives covered in the lesson include: the movement of water within the water cycle; the different states of water as it moves through the water cycle; the location of most of the water on Earth; and the concepts of evaporation and condensation. As a language arts extension activity, teachers have the option of having the students write a story about the water molecule's journey. In the 2018-2019 school year, over 440 students within ID4's service area participated in this presentation.

"Do the Water" Video Series - The water that comes out of the tap has quite a story to tell. In this six-video segment, as part of the "Do the Science" series, the process of water purification is explored through scientific concepts, along with a preview of the variety of careers available in the water industry as demonstrated at the Agency's ID4 Henry C. Garnett Water Purification Plant. The videos were made in collaboration with the Kern County Superintendent of Schools and the Jim Burke Education Foundation.

Segment 1: Overview – An overview of water supplies and the beginning of the water purification process at the Agency's ID4 Henry C. Garnett Water Purification Plant is explored in this video.

Segment 2: First Phase of the Water Purification Process – Chemicals are added to aid the water purification process at the Agency's ID4 Henry C. Garnett Water Purification Plant.

Segment 3: Reaction of Chemicals – Chemical reactions are observed as the water passes through the water purification process at the Agency's ID4 Henry C. Garnett Water Purification Plant.

Segment 4: Technology and Chemistry in the Purification Process – Advanced technology and chemistry are required for the water purification process the at the Agency's ID4 Henry C. Garnett Water Purification Plant.

Segment 5: The Laboratory – A broad spectrum of equipment and analyses are required in the laboratory at the Agency's ID4 Henry C. Garnett Water Purification Plant.

Segment 6: Power Supply – The Agency's ID4 Henry C. Garnett Water Purification Plant has a state-of-the-art power supply facility, which includes a photovoltaic array, stand-by diesel generators and utility power.

Water Education K-6th Grade Assemblies - ID4 offers the following Common Core and Next Generation Science Standards-based grade-level assemblies and materials to schools located within ID4's service area. All assemblies address Kern County's State and local water supplies, the Henry C. Garnett Water Purification Plant, local groundwater banking programs and water conservation. The lively assemblies include colorful pictures and videos as well as interactive activities for the students to follow. At the conclusion of the assembly, all teachers receive a water education curriculum packet and grade-level educational materials for all students. An effort has been made to integrate many subject areas (science, social studies, English-language arts and art) and to help students develop specific skills (critical thinking, organizing data and predicting).

Kindergarten Assembly Program – "Ruby the Radish" - Urban Water Use and Water Conservation Story - This Common Core and Next Generation Science Standards-based Water Education unit was designed to teach Kindergarten students within ID4's service area the importance of water and its conservation. This unit includes the story "Ruby the Radish", which has been written and illustrated exclusively for ID4. In the story, the main character Ruby the Radish starts as a seed, and raises awareness of how to use water wisely as she grows. Through the interaction with the other characters in the story, Ruby the Radish can relay to the young reader ways to help save and conserve water inside and outside the average urban household. Also, in the unit are three lesson plans, which have been created to coordinate with the story, and materials to conduct the activities outlined in the lesson plans. The lesson plans included are: Responding to Literature, Water Cycle in a Cup and Growing Radishes. To reach more people, a special part of the unit calls for each student to take the storybook home to read to members in the household and complete a water conservation home survey.

A 20-minute Kindergarten assembly presentation has been created around the character Ruby the Radish. The assembly addresses where water in ID4 comes from, how the water is cleaned and purified, and how to save and conserve water. The Water Education unit is also introduced and given to the teachers at the end of the assembly. In the 2018-2019 school year, 1,255 students within ID4's service area participated in this program.

1st Grade Assembly Program – "Suzie-Q's Water Awareness Campaign" - Urban Water Use and Water Conservation - This Common Core and Next Generation Science Standards-based Water Education unit has been designed to teach 1st grade students within ID4's service area the importance of water and its conservation. This Water Education unit includes the story "Suzie-Q's Water Awareness Campaign," which has been written and illustrated exclusively for ID4. The story features a main character Suzie-Q, also known to her friends as "The Queen of Water Conservation," a heroic squirrel that leaps from tall trees to make urban Bakersfield residents aware of water conservation. Also in the unit are three lesson plans, which have been created to coordinate with the story, and materials to conduct the activities outlined in the lesson plans. The lesson plans included are: Responding to Literature, Water Molecules in Motion and The Amazing Water Molecule. To reach more people, a special part of the unit calls for each student to take home a plush squirrel along with the storybook to read to members in the household and complete a water conservation home survey.

A 30-minute 1st grade assembly presentation was created around the character Suzie-Q. The assembly addresses where water in ID4 comes from, how the water is cleaned and purified, and how to save and conserve water. The unit is also introduced and given to the teachers at the end of the assembly. In the 2018-2019 school year, 1,100 students within ID4's service area participated in this program.

2nd Grade Assembly Program – "Casey's Incredible Journey" - Water Purification and Water Conservation − This Common Core and Next Generation Science Standards-based Water Education unit has been designed to teach 2nd grade students within ID4's service area how their water is purified and how they can save that water. This Water Education unit includes the story "Casey's Incredible Journey," which has been written and illustrated using photographs exclusively for ID4. The story features a main character Casey the Water Drop, who takes an incredible journey from the top of Mt. Whitney through the Henry C. Garnett Water Purification Plant before going to homes and businesses in metropolitan Bakersfield. Also, in the unit are three lesson plans, which have been created to coordinate with the story, and materials to conduct the activities outlined in the lesson plans. The lesson plans included are: Responding to Literature, Exploring the Scientific Process and Our Water Footprint. In an effort to reach more people, a special part of the unit calls for each student to take home a plush water drop along with the storybook to read to members in the household and complete a water conservation home survey.

A 40-minute 2nd grade assembly presentation was created around the character Casey. The assembly addresses where water in ID4 comes from, how the water is purified, how to save and conserve water, and features a fun water conservation game show that details the steps through the purification process. The unit is also introduced and given to the teachers at the end of the assembly. In the 2018-2019 school year, over 1,210 students within ID4's service area participated in this program.

3rd-4th Grade Assembly Program - Uncover the Facts! Metropolitan Bakersfield's Water Story - Water in California is the theme explored in this exciting Common Core and Next Generation Science Standards-based program that highlights Bakersfield's rich water history and how water is moved throughout the state of California. The 45-minute engaging and interactive assembly teaches students about Kern County's water supplies, how that water is used and the importance of water conservation. An interactive part of the assembly invites students to help build a pizza display, allowing them to see how much water is required to make one of the foods we all enjoy. At the conclusion of the assembly, all teachers receive a curriculum packet and water education materials for the classroom. In the 2018-2019 school year, 2,979 students within ID4's service area participated in this program.

5th-6th Grade Assembly Program - H2O & You – Exploring Metropolitan Bakersfield's Water Supplies - Water Awareness is the theme explored in this exciting Common Core and Next Generation Science Standards-based program that highlights the water cycle, the importance of groundwater and how water is purified at the Henry C. Garnett Water Purification Plant. The 50-minute engaging and interactive assembly features an exploration of the scientific process through the demonstration of two chemistry experiments on the chemical components of water. At the conclusion of the assembly, all teachers receive a curriculum packet and water education materials for the classroom. In the 2018-2019 school year, 2,374 students within ID4's service area participated in this program.

Water Education 7-12th Grade Presentations

ID4 offers a Next Generation Science Standards-based presentation to schools located within ID4's service area.

Local and State Water Supplies

This 45-minute classroom presentation leads students through a discussion of local and State water sources, and the history of California's complex water system. Students are also introduced to the water purification process, and to varied and numerous career opportunities in the water industry. As an extension activity, teachers have the option of showing ID4's "Do the Water" video segments that explain the purification process. At the conclusion of the presentation, teachers receive a California water map poster for their classrooms. In the 2018-2019 school year, 220 students within ID4's service area participated in this presentation.

Planning & Engineering

ID4 Construction & Maintenance Projects

CVC Extension Pool 8 Lining Project: In 2019, Agency staff continued to work with Provost and Pritchard Consulting Group on the preparation of the project contract bidding documents. Work was also performed on the acquisition of right-of-way to facilitate the construction process. Concrete mix design and testing was also completed in advance of the project construction phase. The contract will be issued for public bid pending the successful acquisition of grant funds.

East and North Pipeline Integrity Analysis: In October 2018, the Phase 1 report was completed. The report provided recommendations for temporary pipeline repair kits for potential future pipeline failures. In June 2019, the pipeline manufacturer was authorized to begin development of the fabrication submittal package for the first set of repair kits. The factory submittals were approved by the Agency, the kits were fabricated and then delivered to the Agency in November of 2019.

Oswell Tank Roof Vent Replacement Project: In October 2019 the contract bidding documents were prepared for the Oswell Tank Roof Vent Replacement Project. The scope of work includes the replacement of the roof vent, the center structural rafters and the interior roof coating. The documents were distributed for public bid in October and opened in December 2019. Construction for the project will begin in January 2020.

Oswell and 23 Corner PLC Upgrade: In May 2019, Programmable Logic Controller (PLC) equipment was purchased to upgrade the PLCs at the Oswell and 23 Corner Tank sites. Programming was completed in July 2019. Installation of equipment was completed on December 2019. The upgraded PLCs will operate in parallel with the existing system for testing purposes until the completion of the Oswell Tank Roof Vent Replacement Project when final cutover will occur.

Henry C. Garnett Water Purification Plant

Operations

In 2019, the Henry C. Garnett Water Purification Plant delivered 38,215 af of water for domestic consumption. This represents a 4 percent increase when compared to the amount delivered in 2018 (36,752 af). Additional water was used for filter backwash, plant process use, sludge discharge and evaporation. The peak production flow occurred on July 28, 2019 and amounted to 58.9 million gallons per day (mgd). This represents 57 percent of the expanded maximum permitted flow of 103 mgd. The Henry C. Garnett Water Purification Plant did not operate at flows greater than design capacity in 2019.

The Henry C. Garnett Water Purification Plant's chemical costs were 9 percent more in 2019 than 2018 ($1,051,166 in 2019 and $960,812 in 2018). This represents an incremental cost increase of approximately $1.36 per af of water delivered for domestic purposes. This change is a result of changes in source water quality. In 2019, chemicals consisting of sodium hypochlorite, aluminum sulfate, sodium hydroxide, cationic polymer, powdered activated carbon, zinc orthophosphate and sulfuric acid were used for water treatment processes. A detailed accounting of chemical consumption and a complete breakdown of the 2019 and historical operating costs are shown in Table 10. A history of water use by source is in Table 10A. Agency staff continued to use copper sulfate instead of potassium permanganate for algae control in the temperature equalization pond. In 2019, the utilization of copper sulfate as an oxidant continued to show a significant cost savings compared to potassium permanganate, with no impact to water quality.

Agency staff also conducted semiannual well measurements within ID4. This included static water level monitoring of hundreds of wells in the metropolitan Bakersfield area.

Agency staff continued to operate the ID4 Solar Photovoltaic Project (Solar Project) in 2019. The Solar Project produced a total of 1,540 megawatt-hours of energy (MWh), saving $227,283 through energy offset production in 2019. The Solar Project began producing energy in March 2009. Annual summaries of the energy produced, California Solar Initiative (CSI) rebates earned and energy cost offsets are shown in the following table.

ID4 Solar Project Operations

Year	MWh Produced	CSI Rebate	Energy Cost Offset
2009	1,286	$622,955	$149,343
2010	1,602	$773,818	$171,503
2011	1,661	$802,313	$175,021
2012	1,853	$907,434	$185,569
2013	1,939	$935,629	$149,595
2014	1,671	$146,500	$150,121
2015	1,358	-	$118,018
2016	1,511	-	$135,294
2017	1,764	-	$156,814
2018	1,469	-	$139,018
2019	1,540		$227,283
Totals	**17,654**	**$4,188,649**	**$1,757,578**

Maintenance

Agency staff provided support and coordination for ID4 maintenance and construction projects to continue reliable and efficient operations, and to minimize treatment and distribution facility outages. Support includes:

- Continued drafting and implementing new preventive maintenance procedures and safety protocols for various ID4 facilities and equipment.
- Started annual cleaning, inspections and repairs to Train A and B sedimentation basins.
- Performed the removal of North No. 2 pump and motor for repairs.
- Replaced the Oswell Booster Pump No. 2 pump and motor.
- Completed the annual cross connection control survey and backflow testing for ID4 facilities.
- Installed a new 50Kw UPS System for the Henry C. Garnett Water Purification Plant.
- Replaced the North Pump Station No. 2 autotransformer.
- Oversaw tree removal and safety pruning at the Henry C. Garnett Water Purification Plant and Oswell facilities.
- Upgraded the electrical panel for the Oswell storage facility generator room.
- Upgraded the electrical panel for the Temperature Equalization Pond outlet structure.
- Installed a new PLC for the Oswell and 23 Corner storage facilities.
- Rebuilt one Train A flocculator.
- Oversaw the raise to grade project for a Northwest feeder pipeline blow off station.
- Oversaw the repair for the effluent pipe leak on the Oswell 6.8 million gallon (mg) storage tank.
- Installed a new eyewash / shower station at the Oswell storage facility.
- Assisted the Agency's electrical engineer with the filter upgrade project.
- Installed new electrical feeders and motor termination enclosure on East Pump No. 2.
- Performed weed removal and landscaping for all clearwells.
- Performed weed removal and landscaping around the Temperature Equalization Pond and adjacent basins.
- Pulled the Calloway extension travelling screen for repairs and modification.
- Performed annual water distribution pump and motor maintenance.
- Replaced the pull box and concrete collar on one Northwest Feeder fiber pull box vault, also completed visual inspections of remaining pull box vaults.
- Replaced the pressure switch for the North Pump Station air compressor.
- Updated annual road permit for the City of Bakersfield Right of Way.
- Completed Dewatering and Inspections of the 6.8mg and 0.5mg Oswell storage tanks.

- Provided oversight and assisted with the Northwest Feeder Pump Station Variable Frequency Drive (VFD) No. 2 and No. 3 rehabilitation project.
- Performed the inspection of the Primary Coagulant Storage Tanks Nos. 1,2,3&4.
- Assisted the Agency's electrical engineer with the Train A and B Filter PLC Upgrade Project.
- Assisted with repair and rehabilitation on the Raw Water Pump Station VFD Unit "A".
- Replaced the powdered activated carbon feed facility's delivery piping and injection quill assembly.
- Oversaw the Calloway extension cleaning project.
- Completed light-emitting diode (LED) lighting retrofits for the Train B pipe gallery.

Laboratory

Title 22 and constituents of concern analyses were performed on the Henry C. Garnett Water Purification Plant treated and source water, and several groundwater wells. Treated and source water samples were also analyzed quarterly for 1,2-dibromomethane (EDB), 1,2-dibromo-3-chloropropane (DBCP), volatile organic chemical (VOC), general mineral, physical, metal and inorganic nonmetallic constituents, and monthly for general mineral, physical and inorganic nonmetallic constituents. The influent water supply, when consisting primarily of groundwater, was analyzed weekly for arsenic, conductivity and nitrate, and monthly for EDB, DBCP, VOCs and gross alpha as requested by the State Water Resources Control Board, Division of Drinking Water (DDW).

The distribution system was monitored weekly for coliform bacteria and physical constituents, monthly for total organic carbon (TOC) and total trihalomethanes (TTHM), and quarterly for regulated haloacetic acid (HAA5), TOC and TTHM constituents. Treated water was monitored every other week, and six distribution system sample locations were monitored twice a year for pH, calcium, orthophosphate and zinc as requested by DDW due to corrosion control treatment in the distribution system.

Kern River sanitary survey samples were collected quarterly and analyzed for general mineral, physical, coliform bacteria, TOC, dissolved oxygen and VOC constituents. Lake Isabella was monitored for VOCs following all holiday weekends, and Lake Ming was monitored periodically for VOCs following any drag boat races as requested by DDW.

Taste and odor samples were analyzed weekly in the warmer months and monthly in the cooler months in an effort to detect and avoid odor incidents. Multiple batches of copper samples were analyzed as a result of aquatic growth control measures occurring in the temperature equalization pond. Samples were periodically collected from the Oswell Large Tank and analyzed to determine the effect of powder activated carbon on the concentration of HAA5.

Financial Aspects of the Project

ID4 is an original participant in the construction of the CVC to convey water to the Henry C. Garnett Water Purification Plant and to the Kern River for groundwater replenishment. CVC construction was completed in 1976, and on February 29, 1980, Fox & Company completed a final construction cost audit. The audit was reviewed and accepted by the Agency Board. The total construction cost of the CVC was $22,777,873, of which ID4's share was $6,833,362.

Also, Fox & Company audited the ID4 construction fund to include the original Henry C. Garnett Water Purification Plant and treated water pipelines. This audit was completed on June 30, 1982. Updated construction costs since the two Fox & Company audits are summarized as follows:

CVC (ID4 share)	**$7,132,899**
Purification Plant and Conveyance Facilities	**$25,755,025**
Total	**$32,887,924**

Annual Costs and Revenue

Cash flow for the fiscal year ending June 30, 2019, for all ID4 funds together with a forecast of cash flow conditions for the next fiscal year, is shown in Table 11. These projections are subject to change based on capital projects deemed necessary to the continued operation of ID4. The Agency Board adopted Resolution No. 14-16, which incorporated the Revised Financial Plan and established groundwater charges as well as a long-term surcharge on treated water rates. The new rates are projected to generate adequate revenues for the continued operation of the ID4 Project, while meeting ID4 debt service coverage requirements.

ID4 continues to look for ways to provide a supplemental water supply to metropolitan Bakersfield in a cost-effective manner. Under action taken by the Agency Board in 1996, Zone of Benefit credits are authorized to be used for the purchase of additional water from the State or federal projects. This measure was taken to mitigate the inability of the SWP to deliver 100 percent of Table A amounts annually. ID4 also works to reduce water pumping costs by exchanging SWP water for Friant-Kern and Kern River water. An optimum exchange can eliminate power costs for CVC pumping and potentially lessen the quantity of chemicals applied in the purification process. Chemical costs are affected substantially by the source and condition of the raw water. The availability of most exchanges cannot be predicted; therefore, power and chemical costs are budgeted conservatively by assuming use of the CVC for all but those exchanges currently in effect.

ID4 Funds

ID4 has four income sources managed within three fund accounts:

1. The ID4 Bond Fund was established to account for the receipts and disbursements of money needed to comply with the interest and redemption requirements of the bonds issued to construct the TWCEP. This fund will continue until the settlement of the debt incurred to construct the TWCEP. The interest and principal payments are being paid through a Capital Facilities Charge (CFC) as provided by the Agreements.

2. Zone of Benefit No. 7 was established in accordance with the SWP contract with the Agency dated November 15, 1963 to account for property taxes collected and interest earned on money held. Zone of Benefit No. 7 is used for the purchase of State or federal water supplies. The 2018-19 tax rate (per $100,000) is $34.63.

3. The Enterprise Fund is an operations fund established to account for money necessary for operation of the Henry C. Garnett Water Purification Plant, the treated water distribution system, groundwater replenishment and ID4's share of CVC costs. Expenditures are primarily for current day-to-day operating expenses and operating equipment. Revenues are recorded by source, principally water sales, groundwater pumping charges and interest earned on reserves. Revenues are derived from groundwater and treated water charges. The 2018-19 charges for each water type were $19 per af for produced agricultural groundwater and $38 per af for all other types of produced groundwater, and sales of treated water were at the rate of $169 per af.

ID4 has no other regular revenue sources other than those described above. Money from the Enterprise Fund can be transferred into either or both of the other two funds to reduce the ad valorem tax burden, but excess revenues collected in the ID4 Bond Fund and Zone of Benefit No. 7 fund must remain in those funds. The estimated Enterprise Fund accumulation as of July 1, 2019 was $6.2 million, including reserves of about $1.5 million for equipment replacement, $0.5 million for CVC power reserves, $2.0 million for catastrophic needs of ID4, $1.0 million for acquisition of additional surface water supplies and $0.5 million for groundwater banking.

The present level of groundwater charges and sales of treated water are projected to yield approximately $11.0 million. It is anticipated that the estimated revenue of ID4 will exceed the estimated operating expenses in 2018-19 due to the decrease in operational and professional service costs related to fewer large maintenance projects being included in ID4's fiscal budget.

Well Registration and Collection of Groundwater Charges

Wells within ID4 are registered pursuant to Section 14.24 of the Act (Table 7).

On July 1, 2019, agricultural groundwater charges were $19 per af, and charges for all other groundwater extractions were $38 per af. For administrative convenience, a flat rate annual charge of $38 was levied for small groundwater-producing facilities and no charge was levied for very small groundwater-producing facilities where the cost of collection would exceed the flat rate charge.

ID4 Financial Management Plan

On April 28, 2016, the Board adopted the Revised Financial Plan, which updated the previous versions of the ID4 Financial Management Plan. The Revised Financial Plan provides detail on the principles and practices to be followed in administering the financial resources of ID4. The Revised Financial Plan identifies the need for a long-term surcharge on treated water rates to address increasing costs associated with operation of the Henry C. Garnett Water Purification Plant and to meet ID4's debt repayment obligation. With the adoption of the Revised Financial Plan, the Board authorized the setting of rates and charges to ensure sufficient revenues to continue the ID4 project.

Refinancing of General Obligation Bonds

In November 2006, the Agency successfully retired the remaining balance of its $17.5 million general obligation bond used to construct the Henry C. Garnett Water Purification Plant, the treated water distribution system and ID4's share of the CVC.

Sale of Certificates of Participation for Capital Projects

In 2006, ID4 issued $27 million in water revenue Certificates of Participation (COP) to fund $22.5 million of the TWCEP costs and refund the 1999 COPs. In 2008, ID4 issued an additional $121 million in water revenue COPs to fund capital improvement projects associated with the TWCEP. In 2016, ID4 issued $89 million in water revenue Refunding Bonds, which resulted in a total net present value of $12 million in savings, by refunding the outstanding 2006 tax-exempt and taxable COPs, Series 2006A and 2006B, respectively, as well as the outstanding 2008 tax-exempt COPs, Series 2008A. In 2006, ID4 also entered into a low-interest loan agreement with the DWR Safe Drinking Water State Revolving Fund (SDWSRF) Program for $2.82 million to fund the Oswell Bypass Project. The SDWSRF loan payments became due in 2010 and will retire in 2030. The SDWSRF loan is a parity obligation to the 2006 COPs.

Money to be used for the repayment of debt is provided for in the Agreements. The Agreements, and subsequent project agreements, include a contract provision for the biannual payment of a CFC to charge purveyors for all capital facility costs, including principal, interest and other costs associated with repayment of any debt incurred in the development and construction of the TWCEP. The Agreement will

be effective through 2035, or until the COPs and any additional financing for the TWCEP are paid in full. Under the Agreements, each purveyor is responsible for its proportionate share of capital costs. The CFC is considered a "general obligation" expense of the purveyor, regardless of the amount of water delivered or whether the capacity is required for delivery of the purveyor's water.

Appendix

Table 1 - 2019 ID4 Water Supplies, Exchanges and Deliveries *All units in acre-feet unless otherwise noted.*

ID4 SUPPLIES	SWP[1]	SWP by Exchange[2]	Kern River	SWP by Exchange[3]	Bank Recovery	Total
SWP (M&I)	57,750					57,750
SWP (Ag)	4,460					4,460
2018 Carryover	7,431					7,431
Article 21	16,539					16,539
Lower River			42,851			42,851
Recovered Supplies						-
Subtotal	86,180	-	42,851	-	-	129,031
ID4 EXCHANGES / OBLIGATIONS						
California Aqueduct	(5,000)					(5,000)
Henry Miller WD (19-037)	(10,000)	10,000				-
Kern County WA	(997)	997				-
Kern Tulare WD (18-079)	(4,000)					(4,000)
Kern Tulare WD (19-034)	(21,607)	21,607				-
Tehachapi-Cummings CWD (19-083)	(301)	301				-
Tehachapi-Cummings CWD (19-087)	6,600					6,600
West Kern WD (19-012)	5,795					5,795
West Kern WD (19-060)		2,080				2,080
Wheeler Ridge-Maricopa WSD (19-082)	(3,073)	3,073				-
Total Exchanges/Obligations	(32,583)	38,058	-	-	-	5,475
Available Supplies	**53,597**	**38,058**	**42,851**	**-**	**-**	**134,506**

acre-feet

ID4 DELIVERIES	SWP[1]	SWP by Exchange[2]	Kern River	SWP by Exchange[3]	Bank Recovery	Total
Henry C. Garnett Water Purification Plant	12,877	20,291	7,588			40,756
In-District Transportation Recharge	5,179	8,556	2,389			16,124
In-District Recharge	18,019	9,211	4			27,234
Out of District Losses	584		4,891			5,475
2800 AC	1,439		596			2,035
Kern Water Bank	4,758		10,000			14,758
Pioneer Project	1,797					1,797
Carryover to 2020	8,944		17,383			26,327
Total Deliveries	**53,597**	**38,058**	**42,851**	**-**	**-**	**134,506**

Table 2 - ID4 Water Recharge and Recovery Asset Summary *All units in acre-feet unless otherwise noted.*

Groundwater Banking Facility	ID4 Interest	Annual Recharge Capacity	Annual Recovery Capacity[6]	ID4 Recharge Capacity	ID4 Recovery Capacity	Summary of Banked Water
Kern Water Bank	9.62%	450,000	230,000	43,290	22,126	177,038
Pioneer Project	10%	146,000	100,000	14,600	10,000	46,996
ID4 Banking Wells[4]	100%		12,000		12,000	31,112
ID4/Rosedale Joint Use Recovery Project[5]	22.2%		21,000		5,940	7,938
Allen Road Well Field	100%		36,000		36,000	
Total		596,000	399,000	57,890	86,066	263,084

[1] *SWP allocation for 2019 was 75 percent.*

[2] *SWP water by exchange with Kern River interests.*

[3] *SWP water by exchange with Friant-Kern interests.*

[4] *ID4 recovery wells and banked water in City of Bakersfield's 2800 Acres Recharge Facility.*

[5] *First priority for 10 cfs of recovery capacity.*

[6] *Recovery capacity varies with respect to depth to groundwater.*

Table 3 - ID4 History of Purification Plant Water Use by Sources *Units in acre-feet unless otherwise noted.*

Year	State Water Project	State Water Project by Exchange[1]	Kern River	State Water Project by Exchange[2]	Recovered	Total
1975						-
1976						-
1977	15,950					15,950
1978	8,329	15,607				23,936
1979	5,347	21,078				26,425
1980	4,288	18,551				22,839
1981	20,457	3,407				23,864
1982	3,584	21,488				25,072
1983	1,287	23,317				24,604
1984	21,068	5,200				26,268
1985	942	23,331				24,273
1986	1,487	22,967				24,454
1987	1,974	23,534				25,508
1988	7,971	21,360				29,331
1989	11,844	15,593				27,437
1990	24,728	2,694				27,422
1991	2,467	9,146			7,719	19,332
1992	6,830	8,442			12,241	27,513
1993	4,653	23,414		2,883		30,950
1994	4,030	20,680		715	4,186	29,611
1995	2,528	28,883			222	31,633
1996	24	28,527		1,387		29,938
1997		25,416		7,980		33,396
1998		26,510		1,906		28,416
1999		28,340				28,340
2000	132	29,023				29,155
2001	3,503	7,579			15,810	26,892
2002	5,228	21,327			1,194	27,749
2003	9,826	14,011			2,111	25,948
2004	4,282	14,419			6,693	25,394
2005	1,967	24,320			787	27,074
2006	7,160	18,412				25,572
2007	4,826	14,874			7,301	27,001
2008	1,462	25,000				26,462
2009	-	28,335				28,335
2010	718	29,231				29,949
2011	2,473	20,751	13,021			36,245
2012	22,272	8,892	14,066			45,230
2013	2,554	19,049	3,007		13,051	37,661
2014		7,682	457		24,179	32,318
2015	963			121	27,948	29,032
2016	7,432	21,735	4,028	665		33,860
2017	3,551	22,257	14,142			39,950
2018	1,566	17,742	15,584	4,223		39,115
2019	12,877	20,291	7,588			40,756
TOTAL	**242,580**	**782,415**	**71,893**	**19,880**	**123,442**	**1,240,210**

[1] *SWP water by exchange with Kern River interests.*

[2] *SWP water by exchange with Friant-Kern interests.*

Table 4 - History of Groundwater Replenishment by ID4 *All units in acre-feet unless otherwise noted.*

Year	% Allocation	Kern-River Runoff (% of mean)[4]	SWP	Recovery[1]	SWP by Exchange[2]	Kern River	Friant-Kern[3]	In-District Recharge	Banked Water	Total
1971					6,400		-	6,400	-	6,400
1972					11,000		-	11,000	-	11,000
1973					67,500		-	67,500	-	67,500
1974					10,900		-	10,900	-	10,900
1975		81%	5,700		-		-	5,700	-	5,700
1976		23%	27,800		-		-	27,800	-	27,800
1977		20%	6,400		2,000		-	8,400	-	8,400
1978	100%	230%	1,470		37,840		2,990	42,300	-	42,300
1979	100%	88%	60,680		36,200		1,120	98,000	-	98,000
1980	100%	208%	23,210		23,230		3,460	49,900	-	49,900
1981	100%	53%	55,270		2,350		480	58,100	-	58,100
1982	100%	168%	5,480		35,810		2,110	43,400	-	43,400
1983	100%	325%	1,250		10,860		3,290	15,400	-	15,400
1984	100%	89%	15,690		5,120		1,690	22,500	-	22,500
1985	100%	89%	7,980		32,280		940	41,200	-	41,200
1986	100%	187%	22,530		68,000		2,220	83,423	9,327	92,750
1987	100%	44%	14,000		18,200		540	32,740	-	32,740
1988	100%	34%	5,210		29,850		-	35,060	-	35,060
1989	100%	50%	6,990		14,040		-	21,030	-	21,030
1990	50%	24%	10,713		3,116		-	13,829	-	13,829
1991	0%	59%	1,651		6,279		-	7,930	-	7,930
1992	45%	39%	2,574	1,750	4,437		-	8,761	-	8,761
1993	100%	126%	51,045	-	30,319		32,727	92,195	21,896	114,091
1994	50%	41%	24,671	-	15,250		193	30,005	10,109	40,114
1995	100%	199%	50,200 [5]	-	76,878		23,000 [5]	104,148	45,935	150,083
1996	100%	128%	58,934	-	65,281		13,283	85,232	52,266	137,498
1997	100%	122%	744	-	66,015		5,432	67,670	4,521	72,191
1998	100%	239%	17,642	-	45,680		4,793	40,427	27,688	68,115
1999	100%	53%	70,898	-	13,872		842	85,543	69	85,612
2000	90%	65%	26,304	-	22,843		4,699	46,054	7,792	53,846
2001	39%	54%	4,440	4,496	18,601		-	24,973	2,564	27,537
2002	70%	43%	7,537	-	43,904		-	41,258	10,183	51,441
2003	90%	70%	24,303	-	24,229		-	20,152	28,380	48,532
2004	65%	48%	20,018	2,640	14,466		-	35,152	1,972	37,124
2005	90%	169%	89,743	689	36,502		16,557	104,053	39,438	143,491
2006	100%	156%	89,601	-	38,962		12,831	107,938	33,456	141,394
2007	60%	26%	25,901	336	20,411		1,567	45,592	2,623	48,215
2008	35%	72%	2,179	124	34,530			10,371		10,371
2009	40%	63%			38,166			9,831		9,831
2010	50%	125%	8,469		56,426			34,946	645	35,591
2011	80%	201%	11,703		38,585	23,453	172	37,668	50,857	88,525
2012	65%	38%	30,969		12,828	18,898		17,465	-	17,465
2013	35%	22%	6,745	20,553	30,982	3,007 [6]		23,626	-	23,626
2014	5%	24%	-	38,441	15,931	774 [6]		22,828	-	22,828
2015	20%	18%	1,500	41,813			210	14,491	-	14,491
2016	60%	51%	13,411		36,426	6,253 [6]	1,000	23,230	-	23,230
2017	85%	260%	16,186		32,543	33,483		42,262	57,311	99,573
2018	35%	49%	4,613		25,702	21,450	4,883	17,533	-	17,533
2019	75%	197%	36,075		38,058	9,981		43,358	18,590	61,948
TOTAL			**968,429**	**110,842**	**1,318,802**	**117,299**	**141,029**	**1,939,274**	**425,622**	**2,364,896**

[1] Recovered from wells on Kern Fan Element property (unavoidable losses in conveyance to Henry C. Garnett Water Purification Plant).

[2] SWP water by exchange with Kern River interests.

[3] Acquired from Friant-Kern interests.

[4] Percentage of the 1894 to date, long-term average of the April-July snowmelt runoff at First Point.

[5] Estimated.

[6] City of Bakersfield delivered its own supply to be delivered via the NW Feeder pipeline.

Table 5 - ID4 History of State Water Project (SWP) Entitlement and Actual Water Deliveries

All units in acre-feet unless otherwise noted.

		SWP SUPPLIES							ID4 Deliveries						
		Table A Entitlement													
Year	SWP Allocation	M&I	Ag	Table A Allocated	Long-Term Purchase	Surplus[9]	Other	Total Supply	Deliveries Within ID4	Banked Water	Water Transfers	Total Deliveries	Carryover	SWP Supply Deficiency	Inability to Accept SWP Supply
1970	100%	18,700		18,700				18,700				-			18,700 [1]
1971	100%	22,100		22,100				22,100	22,100			22,100			
1972	100%	24,500		24,500				24,500	24,500			24,500			
1973	100%	28,000		28,000				28,000	27,907			27,907			93 [3]
1974	100%	31,400		31,400				31,400	30,816			30,816			584 [3]
1975	100%	35,000		35,000				35,000	35,000			35,000			
1976	100%	37,300		37,300				37,300	37,300			37,300			
1977	90%	40,800		36,720				36,720	23,695		5,000	28,695	8,025 [4]	4,080 [2]	
1978	100%	43,100		43,100			10,892	53,992	42,020			42,020			11,972 [3]
1979	100%	45,400		45,400			48,524	93,924	93,924			93,924			
1980	100%	47,700		47,700	1,050		3,104	51,854	38,678			38,678			13,176 [3]
1981	100%	50,200		50,200	1,250		30,545	81,995	71,995			71,995			10,000 [3]
1982	100%	53,600		53,600	1,550		2,000	57,150	20,120			20,120			37,030 [3]
1983	100%	56,000		56,000	1,850			57,850	3,427			3,427			54,423 [3]
1984	100%	59,400		59,400	2,530		7,913	69,843	69,843			69,843			
1985	100%	62,900		62,900	2,795			65,695	65,695		1,100	66,795	2,908		
1986	100%	65,300		65,300	3,875		2,908	72,083	32,040	9,327	1,100	42,467			29,616 [3]
1987	100%	68,800		68,800	3,950			72,750	71,030		1,100	72,130	620		
1988	100%	71,200	9,335	80,535	4,750		620	85,905	73,674		6,100 [4]	79,774	6,131		
1989	100%	73,500	9,860	83,360	5,477		6,530 [4]	95,367	77,367		18,000	95,367			
1990	100%	77,000	10,276	82,138	6,100	1,554		89,792	79,413			79,413	8,828 [6]	5,138 [2]	
1991	30%	77,000	10,276	23,100	5,600	1,554	635	30,889	24,851			24,851	2,500	64,176 [2]	
1992	45%	77,000	10,276	39,274	5,400	1,554	2,500	48,728	44,992			44,992	(1,083) [7]	48,002 [2]	
1993	100%	77,000	10,276	87,276	5,310	1,554	39,189	133,329	109,879	21,896		131,775			
1994	53%	77,000	10,276	46,169	5,220	1,554		52,943	69,917	10,109		80,026	(2,195) [7]	41,107 [2]	
1995	100%	77,000	10,276	87,276	5,050		(2,195) [5]	90,131	108,781	45,935		154,716	2,011		
1996	100%	77,000	10,276	87,276	11,100		2,011	100,387	120,324	52,266		172,590			
1997	100%	77,000	5,946	82,946	11,000			93,946	103,767	4,521		108,288			
1998	100%	77,000	5,946	82,946	10,800			93,746	79,474	27,688		107,162			7,700 [3]
1999	100%	77,000	5,946	82,946	10,600			93,546	191,201	69		191,270			
2000	90%	77,000	5,946	74,651	14,352		47,122	136,125	121,774	7,792		129,566	10,471 [8]	8,295 [2]	
2001	39%	77,000	5,946	32,349	6,219		14,395	52,963	46,744	2,564		49,308		50,597 [2]	
2002	70%	77,000	5,946	58,062	6,455		3,593	68,110	71,195	10,183		81,378		24,884 [2]	
2003	90%	77,000	5,946	74,651	10,503		15,938	101,092	86,619	28,380		114,999	5,062	8,295 [2]	
2004	65%	77,000	5,946	53,915	5,435		7,904	67,254	79,571	1,972		81,543		29,031 [2]	
2005	90%	77,000	5,946	74,651	11,474		72,709	158,834	51,811	39,438		91,249	390	8,295 [2]	
2006	100%	77,000	5,946	82,946	13,219		42,564	138,729	63,921	33,456		97,377	1,425		
2007	60%	77,000	5,946	49,768	4,080		8,280	62,128	63,552	2,623		66,175	(477) [7]	33,178 [2]	
2008	35%	77,000	5,946	29,031			136	29,167	29,167	-		29,167	1,190	53,915 [2]	
2009	40%	77,000	5,946	33,178			1,236	34,414	21,716	-		21,716	12,698	49,768 [2]	
2010	50%	77,000	5,946	41,473			12,974	54,447	43,753	645		44,398	8,182	41,473 [2]	
2011	80%	77,000	5,946	66,357			25,057	91,414	58,378	29,360		87,738	211	16,589 [2]	
2012	65%	77,000	5,946	53,915			1,727	55,642	55,183	-		55,183	1,927	29,031 [2]	
2013	35%	77,000	5,946	29,031			10,314	39,345	47,202	-		47,202	(7,225) [7]	53,915 [2]	
2014	5%	77,000	5,946	4,147			611	4,758	-	-		-	2,993	78,799 [2]	
2015	20%	77,000	5,946	16,589			514	17,103	1,500	-		1,500	11,904	66,357 [2]	
2016	60%	77,000	5,946	49,768			1,232	51,000	13,411	-		13,411	6,426	33,178 [2]	
2017	85%	77,000	5,946	70,504			7,323	77,827	16,186	6,358		22,544	10,805	12,442 [2]	
2018	35%	77,000	5,946	29,031			6,116	35,147	4,613	-		4,613	5,915	53,915 [2]	
2019	75%	77,000	5,946	62,210			16,539	78,749	36,075	7,103		43,178	8,943	20,737 [2]	
TOTALS		**3,244,900**	**227,885**	**2,637,590**	**176,994**	**7,770**	**451,460**	**3,273,814**	**2,706,101**	**341,685**	**32,400**	**3,080,186**	**108,585**	**835,195**	**183,294**

[1] CVC/ID4 project not completed.

[2] Due to State Water Project shortfalls.

[3] Wet years on the Kern River.

[4] Includes 5,000 af released to water pool for use by agricultural districts.

[5] Carryover 6,131 af and 5,000 af Kern-Tulare/Lost Hills/ID4 exchange.

[6] Includes 635 af of carryover and 8,193 af released to water pool for use by agricultural district.

[7] Overdeliveries.

[8] Includes 10,000 af exchanged with Arvin-Edison; 47 af carryover.

[9] Replaced by interruptible water after execution of the Monterey Agreement in December 1994.

Table 6 - Groundwater Production *All units in acre-feet unless otherwise noted.*

Year	Agricultural	All Other	Total Production	Charges Collected
1976	20,000	78,200	98,200	$1,321,000
1977	11,700	61,900	73,600	$1,102,000
1978	14,500	55,500	70,000	$1,119,000
1979	14,100	61,600	75,700	$1,369,000
1980	11,900	63,000	74,900	$1,190,000
1981	12,797	68,697	81,494	$1,458,000
1982	7,655	63,140	70,795	$1,575,700
1983	4,869	62,591	67,460	$1,302,530
1984	9,755	73,052	82,807	$1,564,580
1985	7,568	74,080	81,648	$1,522,013
1986	2,726	74,386	77,112	$1,516,070
1987	4,595	72,330	76,925	$1,426,287
1988	4,555	67,500	72,055	$1,384,849
1989	4,730	69,100	73,830	$1,541,380
1990	5,000	71,000	76,000	$1,546,222
1991	12,000	72,000	84,000	$1,524,830
1992	4,454	81,230	85,684	$1,621,910
1993	3,281	79,455	82,736	$2,365,720
1994	5,743	87,009	92,752	$1,582,433
1995	4,834	80,673	85,507	$2,500,738
1996	3,889	89,226	93,115	$2,736,595
1997	2,089	88,721	90,810	$2,696,467
1998	988	76,492	77,480	$2,315,939
1999	2,676	92,197	94,873	$2,871,004
2000	1,569	92,182	93,751	$2,797,852
2001	1,098	95,677	96,775	$2,828,000
2002	360	99,821	100,181	$2,961,831
2003	173	96,522	96,695	$2,310,515
2004	157	93,290	93,447	$2,799,629
2005	108	82,614	82,722	$2,623,381
2006	380	76,120	76,500	$2,800,000
2007	507	89,794	90,301	$2,983,707
2008	466	94,034	94,500	$3,065,002
2009	636	90,747	91,383	$3,162,445
2010	398	78,027	78,425	$3,103,644
2011	117	75,751	75,868	$2,640,849
2012	63	77,271	77,334	$2,720,115
2013	263	73,677	73,940	$2,679,707
2014	1,657	75,474	77,131	$3,042,016
2015	1,239	65,334	66,573	$2,724,571
2016	337	61,570	61,908	$2,240,097
2017	335	62,601	62,936	$2,261,050
2018	423	60,981	61,404	$2,332,976
2019*	379	61,791	62,170	$2,292,091
Total	**187,070**	**3,366,356**	**3,553,426**	**$95,523,746**

** Estimated production values. Reported use not returned at time of publication.*

Table 7 - Registered Active Wells Within ID4

Year	Commercial	Domestic	Irrigation	Purveyor	Total Active Wells
2010	113	90	12	235	450
2011	114	89	10	224	437
2012	108	87	12	222	429
2013	106	83	11	221	421
2014	105	82	10	222	419
2015	105	82	10	222	419
2016	103	80	10	221	414
2017	99	81	10	221	411
2018	97	78	11	221	407
2019	93	75	11	219	398

Table 8 - History of ID4 Groundwater Charges

Year	Agricultural Use	All Other Uses	Sm Groundwater Facilities
	$/acre-foot	*$/acre-foot*	*$/year*
1975-1978	$7.50	$15.00	$0.00
1978-1994	$10.00	$20.00	$0.00
1994-2008	$15.00	$30.00	$30.00
2008-2009	$17.00	$34.00	$34.00
2009-2012	$17.50	$35.00	$35.00
2012-2015	$18.00	$36.00	$36.00
2015-2018	$18.50	$37.00	$37.00
2018-2020	$19.00	$38.00	$38.00

Table 9 - ID4 Land Use *Units in acres unless otherwise noted.*

Year	M & I	Agricultural	Undeveloped	Total
1972	24,200	19,500	21,700	65,400
1974	30,700	18,400	16,300	65,400
1976	30,600	18,500	16,300	65,400
1978	33,500	18,000	13,900	65,400
1980	36,700	16,500	12,200	65,400
1982	38,600	14,700	12,100	65,400
1984	40,000	12,000	13,400	65,400
1986	42,000	10,800	12,600	65,400
1988	42,270	10,821	12,309	65,400
1990	49,364	8,558	7,478	65,400
1991	49,424	12,493	3,483	65,400
1992	49,759	11,641	4,000	65,400
1993	50,456	11,102	3,842	65,400
1994	51,418	10,214	3,768	65,400
1995	51,472	11,533	2,395	65,400
1996	52,775	9,431	3,194	65,400
1997	53,146	8,816	3,438	65,400
1998	51,503	7,951	5,946	65,400
1999	52,558	7,228	5,614	65,400
2000	53,457	6,592	5,351	65,400

Units in acres unless otherwise noted.

Year	M & I	Agricultural	Undeveloped	Total
2001	54,145	6,204	5,051	65,400
2002	52,907	8,787	3,706	65,400
2003	52,907	8,787	3,706	65,400
2004	52,907	8,788	3,705	65,400
2005	53,019	8,722	3,659	65,400
2006	53,019	8,715	3,666	65,400
2007	52,993	8,742	3,665	65,400
2008	52,993	8,741	3,666	65,400
2009	52,984	8,741	3,675	65,400
2010	55,708	6,029	3,663	65,400
2011	55,708	6,029	3,663	65,400
2012	55,708	6,029	3,663	65,400
2013	55,920	6,359	3,121	65,400
2014	59,055	4,127	2,218	65,400
2015	55,019	5,199	5,182	65,400
2016	55,400	5,100	4,900	65,400
2017	55,600	5,100	4,700	65,400
2018	55,600	5,100	4,700	65,400
2,019	55,700	5,100	4,600	65,400

Table 10 - Henry C. Garnett Water Purification Plant Operations Costs 2019

	Purchased Chemicals ($)	Labor ($)	Energy ($)	Miscellaneous Expenditures[1] ($)	Capital Outlays ($)	Total ($)	Deliveries (af)	Unit Rate ($/af)
January	85,099	190,392	50,285	134,884	45,445	506,105	1,543	328
February	15,383	207,799	22,253	150,561	6,240	402,236	1,377	292
March	42,695	408,681	22,466	119,149	4,115	597,106	1,412	423
April	32,490	144,046	19,556	88,677	-	284,769	2,857	100
May	99,692	190,715	28,351	143,068	11,719	473,545	3,506	135
June	63,279	278,781	46,830	190,960	72,831	652,681	4,585	142
July	189,007	159,134	-	118,010	6,945	473,096	4,836	98
August	198,350	267,815	15,721	164,654	31,229	677,769	5,022	135
September	50,636	191,999	85,707	128,534	8,989	465,865	4,095	114
October	119,669	183,423	37,851	175,405	-	516,348	3,778	137
November	75,655	179,889	39,019	124,205	-	418,768	2,962	141
December	79,211	186,787	-	168,275	4,970	439,243	2,242	196
Totals	**1,051,166**	**2,589,461**	**368,039**	**1,706,382**	**192,483**	**5,907,531**	**38,215**	**155**

Table 10A - Henry C. Garnett Water Purification Plant Historic Annual Operations Costs

	Purchased Chemicals ($)	Labor ($)	Energy ($)	Miscellaneous Expenditures[1] ($)	Capital Outlays ($)	Total ($)	Deliveries (af)	Unit Rate ($/af)
2010	449,778	1,812,786	228,145	919,363	46,664	3,456,736	29,384	118
2011	737,123	2,214,315	308,645	1,089,838	105,667	4,455,588	33,849	132
2012	1,004,474	2,483,452	388,139	1,069,633	493,580	5,439,278	41,209	134
2013	571,682	2,648,915	368,357	1,090,748	1,041,009	5,720,711	36,294	157
2014	438,238	2,735,526	463,511	1,193,138	468,392	5,298,805	31,332	176
2015	403,424	2,769,409	275,214	1,606,540	121,114	5,175,701	27,877	186
2016	647,088	2,614,321	305,148	1,393,931	48,165	5,008,653	32,364	155
2017	912,336	2,636,823	317,412	1,448,409	85,733	5,400,713	37,993	142
2018	960,812	2,884,463	326,469	1,794,815	251,590	6,218,149	36,752	169
2019	1,051,166	2,589,461	368,039	1,706,382	192,483	5,907,531	38,215	155
Totals	**5,164,143**	**19,915,547**	**2,654,571**	**9,811,600**	**2,410,324**	**39,956,185**	**270,302**	

[1] *Includes: operations (less chemicals), maintenance, office supplies, memberships, professional services, licenses & permits, insurance premiums, debt service on ID4 capital assets, Agency overhead charges and other expenses.*

Table 11 - ID4 - Operations Fund

Revenues	Final Actual 2016-17	Actual 2017-18	Final Budget 2018-19	Estimated Actual 2018-19	Proposed Budget 2019-20
4150 Treated Water Sales	7,154,015	8,656,121	8,331,700	8,258,650	8,546,200
4170 Other Water Sales	88,361	56,602	50,000	50,000	50,000
Water Sales Total	**7,242,376**	**8,712,723**	**8,381,700**	**8,308,650**	**8,596,200**
4290 Refunds & Credits	4,320	-	-	-	-
Credits & Refunds Total	**4,320**	**-**	**-**	**-**	**-**
4400 Participant's Annual Payments	196,420	196,420	196,420	196,420	196,420
4401 Participant's O&M Costs	749,510	780,047	816,454	816,500	901,150
4402 Participant's Power Costs	3,422,418	2,839,591	3,571,000	2,566,000	3,541,720
4430 Exchange/Conveyance Fees	255,932	87,457	884,000	561,590	629,360
4499 Other User Charges	(296,826)	33,265	970,760	33,260	958,260
User ChargesTotal	**4,327,454**	**3,936,780**	**6,438,634**	**4,173,770**	**6,226,910**
4500 Groundwater Charge Collection	2,267,114	2,324,845	2,740,000	2,600,000	2,600,000
Ground Water Charges Total	**2,267,114**	**2,324,845**	**2,740,000**	**2,600,000**	**2,600,000**
4610 Reimburseables	62,843	3,736,244	350,000	660,000	450,000
Reimbursements Total	**62,843**	**3,736,244**	**350,000**	**660,000**	**450,000**
4700 Investment Income	85,631	91,580	85,000	85,000	85,000
4705 Interest From Other Sources	-	-	-	-	-
Interest Income Total	**85,631**	**91,580**	**85,000**	**85,000**	**85,000**
4800 Proceeds from Debt Issuance	-	-	-	-	-
Proceeds From Debt Insurance Total	**-**	**-**	**-**	**-**	**-**
4900 Other Revenue	2,529,571	1,803,581	800,000	671,100	-
4901 Disposal of Fixed Assets	-	600	-	-	-
4902 Lease Income	-	-	-	-	-
4911 Water Analyses	17,218	23,508	17,500	20,000	20,000
Other Revenue Total	**2,546,789**	**1,827,689**	**817,500**	**691,100**	**20,000**
Total Revenues	**16,536,527**	**20,629,861**	**18,812,834**	**16,518,520**	**17,978,110**

Table 11 - ID4 - Operations Fund - continued

Expenditures	Final Actual 2016-17	Actual 2017-18	Final Budget 2018-19	Estimated Actual 2018-19	Proposed Budget 2019-20
5000 Salaries Regular	2,154,249	2,167,888	2,386,280	2,080,000	2,357,160
5001 Salaries Overtime	35,287	49,057	51,750	53,700	45,000
5002 Salaries Temporary	4,977	6,843	3,000	150	3,000
5010 Benefits Social Security	156,397	159,172	187,720	172,020	194,320
5011 Workers Compensation Insurance	36,749	(11,612)	58,760	53,720	62,680
5012 Benefits Unemployment Insurance	-	-	-	-	-
5020 Benefits Retirement	920,551	931,577	1,192,820	1,018,100	1,144,520
5021 Benefits Health Insurance	567,642	623,144	887,699	831,000	944,580
5022 Benefits Life Insurance	17,499	18,016	20,520	17,210	21,600
5023 Benefits Dental Insurance	25,523	23,534	28,800	22,240	30,000
5024 Benefits Vision Insurance	5,789	5,645	6,960	5,390	6,720
5025 Benefits LTD Insurance	16,988	17,837	24,000	20,750	23,520
5026 Benefits LTC Insurance	3,371	2,965	4,320	2,810	4,200
Labor CostsTotal	**3,945,022**	**3,994,066**	**4,852,629**	**4,277,090**	**4,837,300**
5250 Member Unit Credits	-	-	-	-	-
Member Unit Credit Total	**-**	**-**	**-**	**-**	**-**
5100 Groundwater Recharge Fees	156,222	79,531	228,460	277,500	226,000
5101 Groundwater Extraction Fees	379,021	134,789	1,231,430	579,000	950,360
5103 Water Exchange & Convey. Fees	40,275	79,915	45,000	248,440	66,000
5115 Reregulation Fees	-	-	-	-	-
5130 CVC O&M Costs	623,134	1,238,925	1,241,720	1,466,910	1,568,000
5131 CVC Power & Standby Charges	200,365	558,113	500,000	475,000	500,000
5170 Other Water Purchases	-	53,590	-	-	-
Water Purchases & Fees Total	**1,399,017**	**2,144,863**	**3,246,610**	**3,046,850**	**3,310,360**
5260 Fuels, Oils and Grease	30,765	45,989	37,500	36,950	38,700
5270 Chemicals	873,036	832,263	924,000	950,000	1,000,000
5280 Water Analyses	97,272	97,513	90,500	90,500	90,500
5290 Rents and Leases	10,916	4,411	6,000	12,000	9,000
5299 Other Operating Supplies	6,462	3,037	5,500	2,750	5,500
Operations Total	**1,018,451**	**983,213**	**1,063,500**	**1,092,200**	**1,143,700**
5300 Power for Operations	3,332,358	3,111,274	4,138,000	2,961,500	3,921,720
5301 Standby Charges for Power	20,934	17,450	10,000	31,500	24,000
Power Total	**3,353,292**	**3,128,724**	**4,148,000**	**2,993,000**	**3,945,720**
5400 Maint - Structures & Improvmts	151,614	228,815	173,000	156,400	211,000
5401 Maint - Mobile Equip	15,646	13,353	20,400	17,200	17,400
5402 Maint - Electronic Equip	74,918	190,614	160,100	150,300	100,300
5403 Maint - Wells, Pumps, Motors	357,105	265,970	100,000	121,000	145,000
5404 Maint - Chemicals	1	1	-	100	-
5408 Maint - Office Equip & Furnish	1,792	307	1,000	300	700
5409 Maint - Other	32,858	(3,614)	35,550	25,650	27,800
5410 Maint - Janitorial	18,288	13,030	20,000	13,000	15,000
Maintenance Total	**652,222**	**708,476**	**510,050**	**483,950**	**517,200**

Table 11 - ID4 - Operations Fund - continued

Expenditures - continued	Final Actual 2016-17	Actual 2017-18	Final Budget 2018-19	Estimated Actual 2018-19	Proposed Budget 2019-20
5500 General Office Supplies	2,998	5,269	5,500	5,300	5,350
5501 Printing and Reproduction	366	31	450	100	450
5502 Computer Supplies	3,782	2,475	3,350	3,100	3,550
5503 Publications & Subscriptions	12,192	14,774	14,150	11,900	12,400
5504 Mailing Services	2,241	1,728	2,000	2,050	2,050
5510 Laundry and Uniforms	24,669	20,510	22,200	20,200	20,500
5520 Legal Notices & Job Advertise.	5,209	1,152	-	-	-
5530 Computer Access Fees	2,892	6,902	7,050	5,300	5,350
5540 Promotions & Advertisements	3,242	-	-	3,000	3,000
5550 Assoc. & Prof. Membership Fees	169,496	240,263	226,940	225,940	182,930
5570 Telephone	29,146	17,580	23,950	20,350	23,000
5571 Utilities	5,335	6,034	6,200	4,710	5,800
5581 Liability Insurance	13,007	42,190	71,100	67,400	70,000
5582 Property Insurance	39,840	35,013	50,870	51,300	81,300
5589 Safety Programs & Equipment	25,714	20,005	24,100	24,150	24,900
5590 Directors' Fees	18,819	15,488	17,000	8,000	17,200
5591 Business Meetings & Travel	8,891	8,398	15,950	15,300	15,700
5592 Education & Training	5,857	3,860	10,700	10,500	10,500
5593 Employee Recruitment	6,848	16,531	4,200	500	-
5599 Agency Overhead Allocation	1,107,668	1,170,915	1,218,500	1,218,500	1,288,100
AdministrationTotal	**1,488,212**	**1,629,118**	**1,724,210**	**1,697,600**	**1,772,080**
5601 Legal Services	9,662	14,347	10,000	13,000	10,000
5602 Consulting Engineers	161,858	121,824	97,500	87,500	108,000
5603 Audit Services	10,122	12,020	12,700	10,000	14,700
5604 Special Consultants	113,905	184,668	202,750	198,100	235,750
Professional Services Total	**295,547**	**332,859**	**322,950**	**308,600**	**368,450**
5710 Land Purchase	-	-	-	-	-
5720 Structures & Improvements	2,251,982	932,964	1,163,150	168,500	790,700
5730 Mobile Equipment	-	-	35,000	33,000	35,000
5740 Electrical & Mechanical Equip	112,540	176,215	138,500	139,300	103,000
5790 Other Equipment	-	-	-	-	-
Capital Outlays Total	**2,364,522**	**1,109,179**	**1,336,650**	**340,800**	**928,700**
5800 Principal on Long Term Debt	128,803	131,900	135,070	135,070	138,000
5801 Interest on Long Term Debt	49,760	46,642	43,500	43,500	40,210
Debt Repayment Total	**178,563**	**178,542**	**178,570**	**178,570**	**178,210**
5910 Tax Collection Charge	-	-	-	-	-
5920 Amort. / Deprec. Expense	4,895,403	694,304	-	760,170	-
5950 Licenses & Permits	51,717	36,686	39,500	39,500	39,500
5951 Prof. License & Certification Fees	1,591	475	1,700	1,500	1,500
5960 Security	62,830	65,559	63,000	63,000	64,000
5970 Special Projects	2,549,904	5,150,747	-	215,000	-
5999 Other Expenses	25,728	18,342	19,400	24,950	32,700
Other Expenses Total	**7,587,173**	**5,966,113**	**123,600**	**1,104,120**	**137,700**
5900 Unapplied Appropriations	-	-	-	-	-
Unapplied Appropriations Total	**-**	**-**	**-**	**-**	**-**
Total Expenditures	**22,282,021**	**20,175,153**	**17,506,769**	**15,522,780**	**17,139,420**

Table 12 - Treated Water 2019

Constituent	Maximum Contaminant Level			Parameter			Months in Compliance	
Microbiological								
Coliform Bacteria	> 5.0% of samples present for coliform bacteria in one month			40 or more samples collected per month			12	
Constituent	**Units**	**PHG**	**MCL**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Average**
Primary Inorganic Chemicals								
Aluminum	mg/L	0.6	1	ND	ND	0.057	ND	0.014
Antimony	mg/L	0.001	0.006	ND	ND	ND	ND	ND
Arsenic	mg/L	0.000004	0.010	ND	ND	ND	ND	ND
Asbestos	MFL	7	7	-	ND	-	-	N/A
Barium	mg/L	2	1	ND	ND	ND	ND	ND
Beryllium	mg/L	0.001	0.004	ND	ND	ND	ND	ND
Cadmium	mg/L	0.00004	0.005	ND	ND	ND	ND	ND
Chromium, Total	mg/L	N/A	0.05	ND	ND	ND	ND	ND
Chromium, Hexavalent	mg/L	0.00002	N/A	-	ND	-	-	N/A
Cyanide	mg/L	0.15	0.15	-	ND	-	-	N/A
Fluoride	mg/L	1	2	0.14	ND	ND	0.11	0.06
Lead*	mg/L	0.0002	0.015	ND	ND	ND	ND	ND
Mercury	mg/L	0.0012	0.002	ND	ND	ND	ND	ND
Nickel	mg/L	0.012	0.1	ND	ND	ND	ND	ND
Nitrate (as Nitrogen, N)	mg/L	10	10	0.65	ND	ND	ND	0.16
Nitrite (as Nitrogen, N)	mg/L	1	1	ND	ND	ND	ND	ND
Nitrite + Nitrate (sum as Nitrogen, N)	mg/L	10	10	0.65	ND	ND	ND	0.16
Perchlorate	mg/L	0.001	0.006	-	-	ND	-	N/A
Selenium	mg/L	0.03	0.05	ND	ND	ND	ND	ND
Thallium	mg/L	0.0001	0.002	ND	ND	ND	ND	ND
Secondary Standards								
Aluminum	mg/L	N/A	0.2	ND	ND	0.057	ND	0.014
Color	Units	N/A	15	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Copper*	mg/L	0.3	1.3	ND	ND	ND	ND	ND
Foaming Agents (MBAS)	mg/L	N/A	0.5	-	ND	-	-	N/A
Iron	mg/L	N/A	0.3	ND	ND	ND	ND	ND
Manganese	mg/L	N/A	0.05	ND	ND	ND	ND	ND
Methyl tert-butyl ether	mg/L	N/A	0.005	ND	ND	ND	ND	ND
Odor	Units	N/A	3	3	1.4	2	1.4	2.0
Silver	mg/L	N/A	0.1	ND	ND	ND	ND	ND
Thiobencarb	mg/L	N/A	0.001	-	ND	-	-	N/A
Turbidity	NTU	N/A	5	0.07	0.06	0.05	0.07	0.06
Zinc	mg/L	N/A	5.0	0.069	0.065	0.050	0.056	0.060
Total Dissolved Solids	mg/L	N/A	1000	270	106	69	92	134
Specific Conductance	uS/cm	N/A	1600	476	157	97.6	150	220
Chloride	mg/L	N/A	500	69.4	6.58	5.04	6.66	21.9
Sulfate	mg/L	N/A	500	51.2	18.1	10.8	19.1	24.8
General Minerals								
Total Alkalinity (as $CaCO_3$)	mg/L	N/A	N/A	70	45	29	48	48
Bicarbonate	mg/L	N/A	N/A	85.4	54.9	35.4	58.6	58.6
Carbonate	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Hydroxide	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Total Hardness (as $CaCO_3$)	mg/L	N/A	N/A	90.3	39.6	16.5	35.6	45.5
Calcium	mg/L	N/A	N/A	22.5	12.2	6.62	11.1	13.1
Magnesium	mg/L	N/A	N/A	8.26	2.20	ND	1.91	3.09
Sodium	mg/L	N/A	N/A	44.7	11.2	9.54	13.2	19.7
Potassium	mg/L	N/A	N/A	2.73	1.71	ND	1.54	1.50
pH	Units	N/A	N/A	7.03	7.07	7.19	7.38	7.17
Additional Analyses								
Ammonia	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Boron**	mg/L	N/A	1	-	ND	-	-	N/A
Bromide	mg/L	N/A	N/A	0.07	ND	ND	ND	0.02
Chlorate**	mg/L	N/A	0.8	0.339	0.303	0.285	0.305	0.308
Chlorite	mg/L	0.05	1.0	ND	ND	ND	ND	ND
Phosphate as PO_4	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Silica	mg/L	N/A	N/A	13.3	15.7	9.59	6.57	11.3
Total Organic Carbon	mg/L	N/A	N/A	1.5	2.3	1.2	1.7	1.7
Radioactivity								
Gross Alpha	pCi/L	N/A	15	-	ND	-	-	N/A

*Values identified as MCLs are Action Levels under the lead and copper rule

**Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 12 - Treated Water 2019

Constituent	Units	PHG	MCL	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Average
Regulated Organic Chemicals								
Total Trihalomethanes	mg/L	N/A	0.080	Refer to Attachment 1				
Haloacetic Acids (HAA5)	mg/L	N/A	0.060	Refer to Attachment 1				
Benzene	mg/L	0.00015	0.001	ND	ND	ND	ND	ND
Carbon Tetrachloride	mg/L	0.0001	0.0005	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	mg/L	0.6	0.6	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	mg/L	0.006	0.005	ND	ND	ND	ND	ND
1,1-Dichloroethane	mg/L	0.003	0.005	ND	ND	ND	ND	ND
1,2-Dichloroethane	mg/L	0.0004	0.0005	ND	ND	ND	ND	ND
1,1-Dichloroethylene	mg/L	0.01	0.006	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	mg/L	0.013	0.006	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	mg/L	0.05	0.01	ND	ND	ND	ND	ND
Dichloromethane	mg/L	0.004	0.005	ND	ND	ND	ND	ND
1,2-Dichloropropane	mg/L	0.0005	0.005	ND	ND	ND	ND	ND
1,3-Dichloropropene	mg/L	0.0002	0.0005	ND	ND	ND	ND	ND
Ethylbenzene	mg/L	0.3	0.3	ND	ND	ND	ND	ND
Methyl tert-butyl ether	mg/L	0.013	0.013	ND	ND	ND	ND	ND
Monochlorobenzene	mg/L	0.07	0.07	ND	ND	ND	ND	ND
Styrene	mg/L	0.0005	0.1	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	mg/L	0.0001	0.001	ND	ND	ND	ND	ND
Tetrachloroethylene	mg/L	0.00006	0.005	ND	ND	ND	ND	ND
Toluene	mg/L	0.15	0.15	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	mg/L	0.005	0.005	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	mg/L	1	0.200	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	mg/L	0.0003	0.005	ND	ND	ND	ND	ND
Trichloroethylene	mg/L	0.0017	0.005	ND	ND	ND	ND	ND
Trichlorofluoromethane	mg/L	1.3	0.15	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-Trifluoroethane	mg/L	4	1.2	ND	ND	ND	ND	ND
Vinyl Chloride	mg/L	0.00005	0.0005	ND	ND	ND	ND	ND
Xylenes (total)	mg/L	1.8	1.75	ND	ND	ND	ND	ND
Regulated Non-Volatile Synthetic Organic Chemicals								
Alachlor	mg/L	0.004	0.002	-	ND	-	-	N/A
Atrazine	mg/L	0.00015	0.001	-	ND	-	-	N/A
Bentazon	mg/L	0.2	0.018	-	ND	-	-	N/A
Benzo(a)pyrene	mg/L	0.000007	0.0002	-	ND	-	-	N/A
Carbofuran	mg/L	0.0007	0.018	-	ND	-	-	N/A
Chlordane	mg/L	0.00003	0.0001	-	ND	-	-	N/A
Dalapon	mg/L	0.79	0.2	-	ND	-	-	N/A
1,2-Dibromo-3-chloropropane	mg/L	0.0000017	0.0002	-	ND	ND	ND	ND
2,4-Dichlorophenoxyacetic acid (2,4-D)	mg/L	0.02	0.07	-	ND	-	-	N/A
Di(2-ethylhexyl)adipate	mg/L	0.2	0.4	-	ND	-	-	N/A
Di(2-ethylhexyl)phthalate	mg/L	0.012	0.004	-	ND	-	-	N/A
Dinoseb	mg/L	0.014	0.007	-	ND	-	-	N/A
Diquat	mg/L	0.006	0.02	-	ND	-	-	N/A
Endothall	mg/L	0.094	0.1	-	ND	-	-	N/A
Endrin	mg/L	0.0003	0.002	-	ND	-	-	N/A
Ethylene Dibromide	mg/L	0.00001	0.00005	-	ND	ND	ND	ND
Glyphosate	mg/L	0.9	0.7	-	ND	-	-	N/A
Heptachlor	mg/L	0.000008	0.00001	-	ND	-	-	N/A
Heptachlor Epoxide	mg/L	0.000006	0.00001	-	ND	-	-	N/A
Hexachlorobenzene	mg/L	0.00003	0.001	-	ND	-	-	N/A
Hexachlorocyclopentadiene	mg/L	0.002	0.05	-	ND	-	-	N/A
Lindane	mg/L	0.000032	0.0002	-	ND	-	-	N/A
Methoxychlor	mg/L	0.00009	0.03	-	ND	-	-	N/A
Molinate	mg/L	0.001	0.02	-	ND	-	-	N/A
Oxamyl	mg/L	0.026	0.05	-	ND	-	-	N/A
Pentachlorophenol	mg/L	0.0003	0.001	-	ND	-	-	N/A
Picloram	mg/L	0.166	0.5	-	ND	-	-	N/A
Polychlorinated Biphenyls	mg/L	0.00009	0.0005	-	ND	-	-	N/A
Simazine	mg/L	0.004	0.004	-	ND	-	-	N/A
Thiobencarb	mg/L	0.042	0.07	-	ND	-	-	N/A
Toxaphene	mg/L	0.00003	0.003	-	ND	-	-	N/A
1,2,3-Trichloropropane	mg/L	0.0000007	0.000005	-	-	ND	-	N/A
2,3,7,8-TCDD (Dioxin)	mg/L	0.00000000005	0.00000003	-	waived	-	-	N/A
2,4,5-TP (Silvex)	mg/L	0.003	0.05	-	ND	-	-	N/A

*Values identified as MCLs are Action Levels under the lead and copper rule

**Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 12 - Treated Water 2019

Constituent	Units	PHG	MCL	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Average
Unregulated Organic Chemicals								
tert-Amyl methyl ether	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Bromobenzene	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Bromochloromethane	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Bromomethane	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Tertiary butyl alcohol**	mg/L	N/A	0.012	0.006	ND	0.010	ND	0.004
n-Butylbenzene**	mg/L	N/A	0.26	ND	ND	ND	ND	ND
sec-Butylbenzene**	mg/L	N/A	0.26	ND	ND	ND	ND	ND
tert-Butylbenzene**	mg/L	N/A	0.26	ND	ND	ND	ND	ND
Chloroethane	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Chloromethane	mg/L	N/A	N/A	ND	ND	ND	ND	ND
2-Chlorotoluene**	mg/L	N/A	0.14	ND	ND	ND	ND	ND
4-Chlorotoluene**	mg/L	N/A	0.14	ND	ND	ND	ND	ND
Dibromomethane	mg/L	N/A	N/A	ND	ND	ND	ND	ND
1,3-Dichlorobenzene**	mg/L	N/A	0.6	ND	ND	ND	ND	ND
Dichlorodifluoromethane**	mg/L	N/A	1	ND	ND	ND	ND	ND
1,3-Dichloropropane	mg/L	N/A	N/A	ND	ND	ND	ND	ND
2,2-Dichloropropane	mg/L	N/A	N/A	ND	ND	ND	ND	ND
1,1-Dichloropropene	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Diisopropyl ether	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Ethyl tert-butyl ether	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Hexachlorobutadiene	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Isopropylbenzene**	mg/L	N/A	0.77	ND	ND	ND	ND	ND
p-Isopropyltoluene	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Naphthalene**	mg/L	N/A	0.017	ND	ND	ND	ND	ND
Nitrobenzene	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Pentachloroethane	mg/L	N/A	N/A	ND	ND	ND	ND	ND
n-Propylbenzene**	mg/L	N/A	0.26	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	mg/L	N/A	N/A	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	mg/L	N/A	N/A	ND	ND	ND	ND	ND
1,3,5-Trichlorobenzene	mg/L	N/A	N/A	ND	ND	ND	ND	ND
1,2,3-Trimethylbenzene	mg/L	N/A	N/A	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene**	mg/L	N/A	0.33	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene**	mg/L	N/A	0.33	ND	ND	ND	ND	ND
Methyl isobutyl ketone**	mg/L	N/A	0.12	ND	ND	ND	ND	ND
Unregulated Non-Volatile Synthetic Organic Chemicals								
Aldicarb**	mg/L	N/A	0.007	-	ND	-	-	N/A
Aldicarb Sulfone	mg/L	N/A	N/A	-	ND	-	-	N/A
Aldicarb Sulfoxide	mg/L	N/A	N/A	-	ND	-	-	N/A
Aldrin**	mg/L	N/A	0.000002	-	ND	-	-	N/A
Bromacil	mg/L	N/A	N/A	-	ND	-	-	N/A
Butachlor	mg/L	N/A	N/A	-	ND	-	-	N/A
Carbaryl**	mg/L	N/A	0.7	-	ND	-	-	N/A
Diazinon**	mg/L	N/A	0.0012	-	ND	-	-	N/A
Dicamba	mg/L	N/A	N/A	-	ND	-	-	N/A
Dieldrin**	mg/L	N/A	0.000002	-	ND	-	-	N/A
Dimethoate**	mg/L	N/A	0.001	-	ND	-	-	N/A
Diuron	mg/L	N/A	N/A	-	ND	-	-	N/A
3-Hydroxycarbofuran	mg/L	N/A	N/A	-	ND	-	-	N/A
Methomyl	mg/L	N/A	N/A	-	ND	-	-	N/A
Metolachlor	mg/L	N/A	N/A	-	ND	-	-	N/A
Metribuzin	mg/L	N/A	N/A	-	ND	-	-	N/A
Propachlor**	mg/L	N/A	0.09	-	ND	-	-	N/A
2,4,5-T	mg/L	N/A	N/A	-	ND	-	-	N/A

*Values identified as MCLs are Action Levels under the lead and copper rule

**Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 12 - Treated Water 2019 - continued

Total Trihalomethanes Monitoring 2019 (State Stage 2 D/DBPR)

Total Trihalomethanes MCL	0.080 ppm				
MCL in CCR units	80 ppb				
Location	2019 TTHM Results (ppb)				
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	LRAA
Site 1: 1022 Sequoia Street	19.2	20.2	31.9	57.8	32.3
Site 2: Francis Street Alley	3.2	21.1	34.9	58.9	29.5
Site 3: NOR Terminal Tank Inlet	34.2	20.9	58.3	66.3	44.9
Site 4: North King & Jeffrey	29.2	24.8	49.9	78.3	45.6
Site 5: Wenatchee Pump Station	23.0	24.3	33.3	65.8	36.6
Site 6: Oswell Large Tank	24.9	59.5	67.1	66.8	54.6
Site 7: Oswell Pump Station	23.1	39.1	35.1	70.5	42.0
Site 8: Seven Seas	25.3	31.4	35.3	85.7	44.4
Site 9: Meany & Alken	23.3	32.1	41.2	48.6	36.3
Site 10: Meany & Coffee	23.4	32.7	37.2	42.6	34.0

CCR Table Excerpt

Contaminant (CCR units)	MCL	PHG (or MCLG)	Highest LRAA	LRAA Range	Sample Date	Violation	Typical Source
TTHM (ppb)	80	N/A	54.6	3.2 - 85.7	2019	No	Byproduct of drinking water disinfection

Haloacetic Acids Monitoring 2019 (State Stage 2 D/DBPR)

Haloacetic Acids MCL	0.060 ppm				
MCL in CCR units	60 ppb				
Location	2019 HAA5 Results (ppb)				
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	LRAA
Site 1: 1022 Sequoia Street	23	19	51.0	41.5	33.6
Site 2: Francis Street Alley	9.1	19	54.2	43.6	31.5
Site 3: NOR Terminal Tank Inlet	32	19	40.8	41.4	33.3
Site 4: North King & Jeffrey	29	25	66.5	45.5	41.5
Site 5: Wenatchee Pump Station	25	26	23.4	39.4	28.5
Site 6: Oswell Large Tank	27	47	79.8	41.3	48.8
Site 7: Oswell Pump Station	25	32	58.4	37.9	38.3
Site 8: Seven Seas	25	26	51.2	50.5	38.2
Site 9: Meany & Alken	25	26	58.6	27.8	34.4
Site 10: Meany & Coffee	25	26	60.0	25.3	34.1

CCR Table Excerpt

Contaminant (CCR units)	MCL	PHG (or MCLG)	Highest LRAA	LRAA Range	Sample Date	Violation	Typical Source
HAA5 (ppb)	60	N/A	48.8	9.1 - 79.8	2019	No	Byproduct of drinking water disinfection

CCR = Consumer Confidence Report

LRAA = Locational Running Annual Average

MCL = Maximum Contaminant Level

MCLG = Maximum Contaminant Level Goal

N/A = Not Applicable

PHG = Public Health Goal

ppb = parts per billion

ppm = parts per million

Table 13 - Source Water 2019

Constituent	Units	PHG*	MCL*	Source			
				Friant Kern	Groundwater	Aqueduct	Kern River
Primary Inorganic Chemicals							
Aluminum	mg/L	0.6	1	0.14	ND	0.24	0.39
Antimony	mg/L	0.001	0.006	ND	ND	ND	ND
Arsenic	mg/L	0.000004	0.010	ND	ND	ND	0.003
Asbestos	MFL	7	7	ND	ND	ND	ND
Barium	mg/L	2	1	ND	ND	ND	ND
Beryllium	mg/L	0.001	0.004	ND	ND	ND	ND
Cadmium	mg/L	0.00004	0.005	ND	ND	ND	ND
Chromium, Total	mg/L	N/A	0.05	ND	ND	ND	ND
Chromium, Hexavalent	mg/L	0.00002	N/A	ND	0.00049	0.00007	ND
Cyanide	mg/L	0.15	0.15	ND	ND	ND	ND
Fluoride	mg/L	1	2	ND	0.15	ND	0.13
Lead**	mg/L	0.0002	0.015	ND	ND	ND	ND
Mercury	mg/L	0.0012	0.002	ND	ND	ND	ND
Nickel	mg/L	0.012	0.1	ND	ND	ND	ND
Nitrate (as N)	mg/L	10	10	ND	0.75	0.24	ND
Nitrite (as Nitrogen, N)	mg/L	1	1	ND	ND	ND	ND
Nitrate + Nitrite (sum as Nitrogen, N)	mg/L	10	10	ND	0.75	0.24	ND
Perchlorate	mg/L	0.001	0.006	ND	-	ND	ND
Selenium	mg/L	0.03	0.05	ND	ND	ND	ND
Thallium	mg/L	0.0001	0.002	ND	ND	ND	ND
Secondary Standards							
Aluminum	mg/L	N/A	0.2	0.14	ND	0.24	0.39
Color	Units	N/A	15	12.5	10.0	17.5	30
Copper**	mg/L	0.3	1.3	ND	ND	ND	ND
Foaming Agents (MBAS)	mg/L	N/A	0.5	ND	ND	ND	ND
Iron	mg/L	N/A	0.3	0.123	0.211	0.280	0.409
Manganese	mg/L	N/A	0.05	ND	ND	0.037	0.050
Methyl tert-butyl ether	mg/L	N/A	0.005	ND	ND	ND	ND
Odor	Units	N/A	3	6	6	4	8
Silver	mg/L	N/A	0.1	ND	ND	ND	ND
Thiobencarb	mg/L	N/A	0.001	ND	ND	ND	ND
Turbidity	Units	N/A	5	1.54	4.40	2.29	3.94
Zinc	mg/L	N/A	5.0	ND	ND	ND	ND
Total Dissolved Solids	mg/L	N/A	1000	40	200	191	95
Specific Conductance	uS/cm	N/A	1600	47	359	343	131
Chloride	mg/L	N/A	500	2.27	41.0	43.2	3.81
Sulfate	mg/L	N/A	500	1.30	25.0	27.4	8.70
General Minerals							
Total Alkalinity (as $CaCO_3$)	mg/L	N/A	N/A	18	84	55	49
Bicarbonate	mg/L	N/A	N/A	22.0	97.6	67.1	59.8
Carbonate	mg/L	N/A	N/A	ND	4.8	ND	ND
Hydroxide	mg/L	N/A	N/A	ND	ND	ND	ND
Total Hardness (as $CaCO_3$)	mg/L	N/A	N/A	9.89	85.3	65.7	39.0
Calcium	mg/L	N/A	N/A	3.96	26.8	14.0	12.0
Magnesium	mg/L	N/A	N/A	ND	4.47	7.49	2.18
Sodium	mg/L	N/A	N/A	3.97	28.8	31.3	9.28
Potassium	mg/L	N/A	N/A	1.02	1.78	2.44	1.83
pH	Units	N/A	N/A	7.48	8.78	8.76	7.60
Additional Analyses							
Ammonia	mg/L	N/A	N/A	ND	-	0.03	0.03
Boron***	mg/L	N/A	1	ND	0.14	0.11	ND
Bromide	mg/L	N/A	N/A	ND	0.13	0.14	0.02
Phosphate	mg/L	N/A	N/A	ND	ND	ND	ND
Silica	mg/L	N/A	N/A	10.2	-	9.70	17.2
Total Organic Carbon	mg/L	N/A	N/A	2.5	1.5	3.0	3.7
Radioactivity							
Gross Alpha	pCi/L	N/A	15	ND	7.55	ND	3.02
Gross Beta	mrem/yr	N/A	4	-	-	-	-
Radium 226	pCi/L	0.05	N/A	-	-	-	-
Radium 228	pCi/L	0.019	N/A	-	-	-	-
Radium 226 + Radium 228	pCi/L	N/A	5	-	-	-	-
Strontium-90	pCi/L	0.35	8	-	-	-	-
Tritium	pCi/L	400	20,000	-	-	-	-
Uranium	pCi/L	0.43	20	-	-	-	-

*Applicable to treated water only

**Values identified as MCLs are Action Levels under the lead and copper rule

***Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

mrem/yr = millirems per year

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 13 - Source Water 2019 - continued

Constituent	Units	PHG*	MCL*	Source			
				Friant Kern	Groundwater	Aqueduct	Kern River
Regulated Volatile Organic Chemicals							
Benzene	mg/L	0.00015	0.001	ND	ND	ND	ND
Carbon Tetrachloride	mg/L	0.0001	0.0005	ND	ND	ND	ND
1,2-Dichlorobenzene	mg/L	0.6	0.6	ND	ND	ND	ND
1,4-Dichlorobenzene	mg/L	0.006	0.005	ND	ND	ND	ND
1,1-Dichloroethane	mg/L	0.003	0.005	ND	ND	ND	ND
1,2-Dichloroethane	mg/L	0.0004	0.0005	ND	ND	ND	ND
1,1-Dichloroethylene	mg/L	0.01	0.006	ND	ND	ND	ND
cis-1,2-Dichloroethylene	mg/L	0.013	0.006	ND	ND	ND	ND
trans-1,2-Dichloroethylene	mg/L	0.05	0.01	ND	ND	ND	ND
Dichloromethane	mg/L	0.004	0.005	ND	ND	ND	ND
1,2-Dichloropropane	mg/L	0.0005	0.005	ND	ND	ND	ND
1,3-Dichloropropene	mg/L	0.0002	0.0005	ND	ND	ND	ND
Ethylbenzene	mg/L	0.3	0.3	ND	ND	ND	ND
Methyl tert-butyl ether	mg/L	0.013	0.013	ND	ND	ND	ND
Monochlorobenzene	mg/L	0.07	0.07	ND	ND	ND	ND
Styrene	mg/L	0.0005	0.1	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	mg/L	0.0001	0.001	ND	ND	ND	ND
Tetrachloroethylene	mg/L	0.00006	0.005	ND	ND	ND	ND
Toluene	mg/L	0.15	0.15	ND	ND	ND	ND
1,2,4-Trichlorobenzene	mg/L	0.005	0.005	ND	ND	ND	ND
1,1,1-Trichloroethane	mg/L	1	0.200	ND	ND	ND	ND
1,1,2-Trichloroethane	mg/L	0.0003	0.005	ND	ND	ND	ND
Trichloroethylene	mg/L	0.0017	0.005	ND	ND	ND	ND
Trichlorofluoromethane	mg/L	1.3	0.15	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-Trifluoroethane	mg/L	4	1.2	ND	ND	ND	ND
Vinyl Chloride	mg/L	0.00005	0.0005	ND	ND	ND	ND
Xylenes (total)	mg/L	1.8	1.75	ND	ND	ND	ND
Regulated Non-Volatile Synthetic Organic Chemicals							
Alachlor	mg/L	0.004	0.002	ND	ND	ND	ND
Atrazine	mg/L	0.00015	0.001	ND	ND	ND	ND
Bentazon	mg/L	0.2	0.018	ND	ND	ND	ND
Benzo(a)pyrene	mg/L	0.000007	0.0002	ND	ND	ND	ND
Carbofuran	mg/L	0.0007	0.018	ND	ND	ND	ND
Chlordane	mg/L	0.00003	0.0001	ND	ND	ND	ND
Dalapon	mg/L	0.79	0.2	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	mg/L	0.0000017	0.0002	ND	ND	ND	ND
2,4-Dichlorophenoxyacetic acid (2,4-D)	mg/L	0.02	0.07	ND	ND	ND	ND
Di(2-ethylhexyl)adipate	mg/L	0.2	0.4	ND	ND	ND	ND
Di(2-ethylhexyl)phthalate	mg/L	0.012	0.004	ND	ND	ND	ND
Dinoseb	mg/L	0.014	0.007	ND	ND	ND	ND
Diquat	mg/L	0.006	0.02	ND	ND	ND	ND
Endothall	mg/L	0.094	0.1	ND	ND	ND	ND
Endrin	mg/L	0.0003	0.002	ND	ND	ND	ND
Ethylene Dibromide	mg/L	0.00001	0.00005	ND	ND	ND	ND
Glyphosate	mg/L	0.9	0.7	ND	ND	ND	ND
Heptachlor	mg/L	0.000008	0.00001	ND	ND	ND	ND
Heptachlor Epoxide	mg/L	0.000006	0.00001	ND	ND	ND	ND
Hexachlorobenzene	mg/L	0.00003	0.001	ND	ND	ND	ND
Hexachlorocyclopentadiene	mg/L	0.002	0.05	ND	ND	ND	ND
Lindane	mg/L	0.000032	0.0002	ND	ND	ND	ND
Methoxychlor	mg/L	0.00009	0.03	ND	ND	ND	ND
Molinate	mg/L	0.001	0.02	ND	ND	ND	ND
Oxamyl	mg/L	0.026	0.05	ND	ND	ND	ND
Pentachlorophenol	mg/L	0.0003	0.001	ND	ND	ND	ND
Picloram	mg/L	0.166	0.5	ND	ND	ND	ND
Polychlorinated Biphenyls	mg/L	0.00009	0.0005	ND	ND	ND	ND
Simazine	mg/L	0.004	0.004	ND	ND	ND	ND
Thiobencarb	mg/L	0.042	0.07	ND	ND	ND	ND
Toxaphene	mg/L	0.00003	0.003	ND	ND	ND	ND
1,2,3-Trichloropropane	mg/L	0.0000007	0.000005	ND	ND	ND	ND
2,3,7,8-TCDD (Dioxin)	mg/L	0.00000000005	0.00000003	waived	waived	waived	waived
2,4,5-TP (Silvex)	mg/L	0.003	0.05	ND	ND	ND	ND

*Applicable to treated water only

**Values identified as MCLs are Action Levels under the lead and copper rule

***Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

mrem/yr = millirems per year

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 13 - Source Water 2019 - continued

Constituent	Units	PHG*	MCL*	Source			
				Friant Kern	Groundwater	Aqueduct	Kern River
Unregulated Volatile Organic Chemicals							
tert-Amyl methyl ether	mg/L	N/A	N/A	ND	ND	ND	ND
Bromobenzene	mg/L	N/A	N/A	ND	ND	ND	ND
Bromochloromethane	mg/L	N/A	N/A	ND	ND	ND	ND
Bromomethane	mg/L	N/A	N/A	ND	ND	ND	ND
Tertiary butyl alcohol***	mg/L	N/A	0.012	ND	ND	ND	ND
n-Butylbenzene***	mg/L	N/A	0.26	ND	ND	ND	ND
sec-Butylbenzene***	mg/L	N/A	0.26	ND	ND	ND	ND
tert-Butylbenzene***	mg/L	N/A	0.26	ND	ND	ND	ND
Chloroethane	mg/L	N/A	N/A	ND	ND	ND	ND
Chloromethane	mg/L	N/A	N/A	ND	ND	ND	ND
2-Chlorotoluene***	mg/L	N/A	0.14	ND	ND	ND	ND
4-Chlorotoluene***	mg/L	N/A	0.14	ND	ND	ND	ND
Dibromomethane	mg/L	N/A	N/A	ND	ND	ND	ND
1,3-Dichlorobenzene***	mg/L	N/A	0.6	ND	ND	ND	ND
Dichlorodifluoromethane***	mg/L	N/A	1	ND	ND	ND	ND
1,3-Dichloropropane	mg/L	N/A	N/A	ND	ND	ND	ND
2,2-Dichloropropane	mg/L	N/A	N/A	ND	ND	ND	ND
1,1-Dichloropropene	mg/L	N/A	N/A	ND	ND	ND	ND
Diisopropyl ether	mg/L	N/A	N/A	ND	ND	ND	ND
Ethyl tert-butyl ether	mg/L	N/A	N/A	ND	ND	ND	ND
Hexachlorobutadiene	mg/L	N/A	N/A	ND	ND	ND	ND
Isopropylbenzene***	mg/L	N/A	0.77	ND	ND	ND	ND
p-Isopropyltoluene	mg/L	N/A	N/A	ND	ND	ND	ND
Naphthalene***	mg/L	N/A	0.017	ND	ND	ND	ND
Nitrobenzene	mg/L	N/A	N/A	ND	ND	ND	ND
Pentachloroethane	mg/L	N/A	N/A	ND	ND	ND	ND
n-Propylbenzene***	mg/L	N/A	0.26	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	mg/L	N/A	N/A	ND	ND	ND	ND
1,2,3-Trichlorobenzene	mg/L	N/A	N/A	ND	ND	ND	ND
1,3,5-Trichlorobenzene	mg/L	N/A	N/A	ND	ND	ND	ND
1,2,3-Trimethylbenzene	mg/L	N/A	N/A	ND	ND	ND	ND
1,2,4-Trimethylbenzene***	mg/L	N/A	0.33	ND	ND	ND	ND
1,3,5-Trimethylbenzene***	mg/L	N/A	0.33	ND	ND	ND	ND
Methyl isobutyl ketone***	mg/L	N/A	0.12	ND	ND	ND	ND
Unregulated Non-Volatile Synthetic Organic Chemicals							
Aldicarb***	mg/L	N/A	0.007	ND	ND	ND	ND
Aldicarb Sulfone	mg/L	N/A	N/A	ND	ND	ND	ND
Aldicarb Sulfoxide	mg/L	N/A	N/A	ND	ND	ND	ND
Aldrin***	mg/L	N/A	0.000002	ND	ND	ND	ND
Bromacil	mg/L	N/A	N/A	ND	ND	ND	ND
Butachlor	mg/L	N/A	N/A	ND	ND	ND	ND
Carbaryl***	mg/L	N/A	0.7	ND	ND	ND	ND
Diazinon***	mg/L	N/A	0.0012	ND	ND	ND	ND
Dicamba	mg/L	N/A	N/A	ND	ND	ND	ND
Dieldrin***	mg/L	N/A	0.000002	ND	ND	ND	ND
Dimethoate***	mg/L	N/A	0.001	ND	ND	ND	ND
Diuron	mg/L	N/A	N/A	ND	ND	ND	ND
3-Hydroxycarbofuran	mg/L	N/A	N/A	ND	ND	ND	ND
Methomyl	mg/L	N/A	N/A	ND	ND	ND	ND
Metolachlor	mg/L	N/A	N/A	ND	ND	ND	ND
Metribuzin	mg/L	N/A	N/A	ND	ND	ND	ND
Propachlor***	mg/L	N/A	0.09	ND	ND	ND	ND
2,4,5-T	mg/L	N/A	N/A	ND	ND	ND	ND

*Applicable to treated water only

**Values identified as MCLs are Action Levels under the lead and copper rule

***Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

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NTU = nephelometric turbidity units

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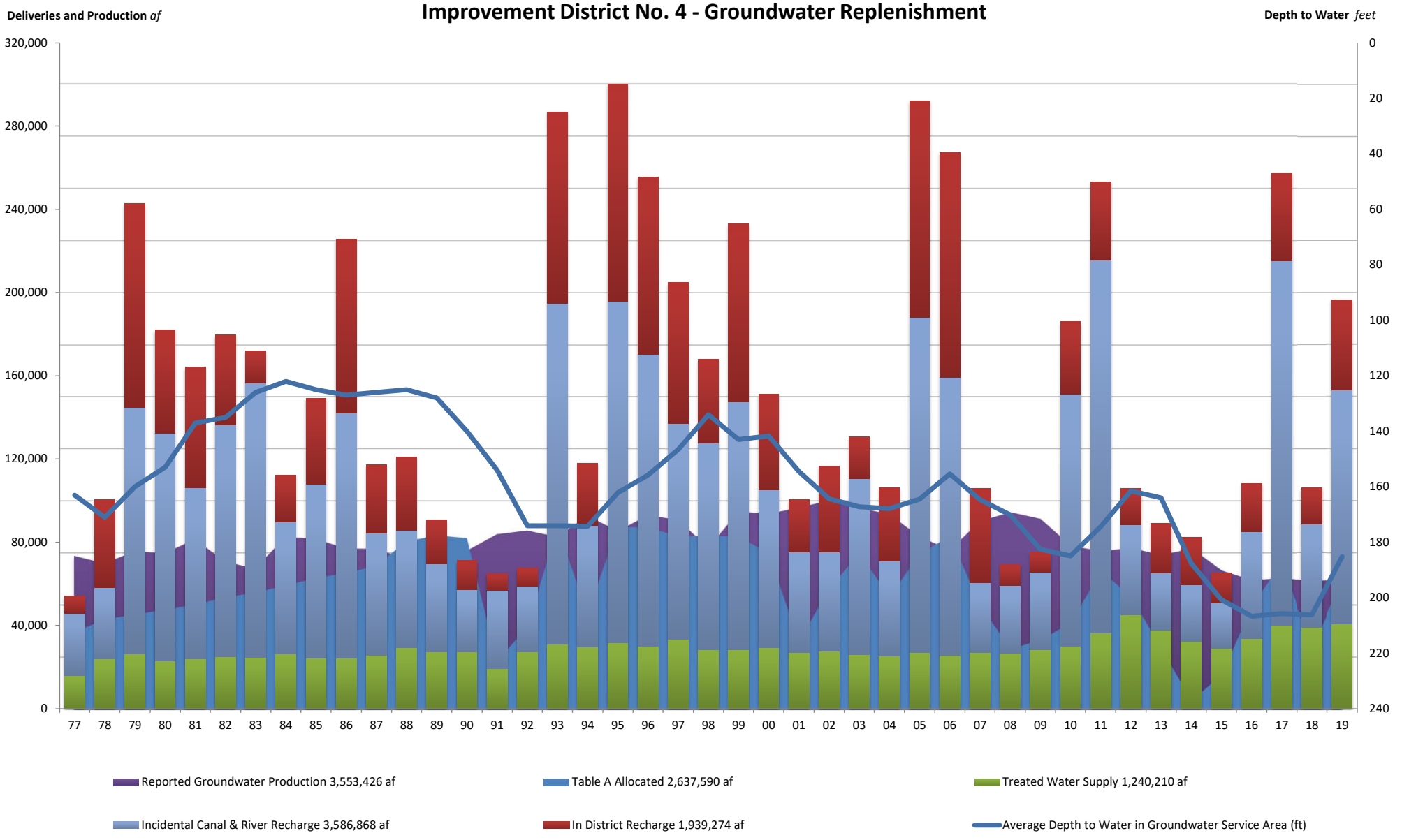


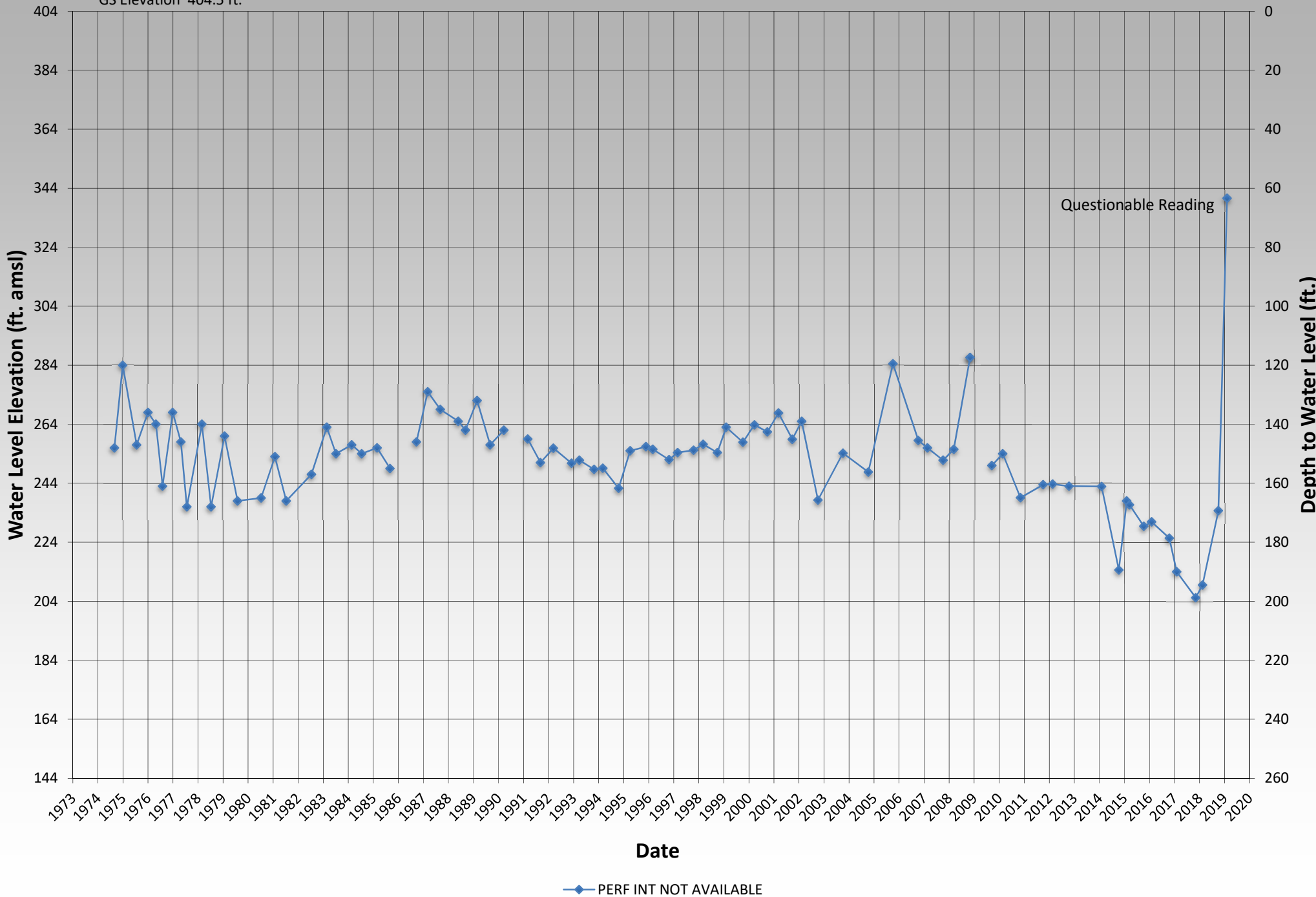
Figure 1 - Groundwater Replenishment

Improvement District No. 4
29S/27E-08H53

Figure 2 - 29S/27E-08H53

GS Elevation 404.5 ft.

KCWA GROUNDWATER DATABASE

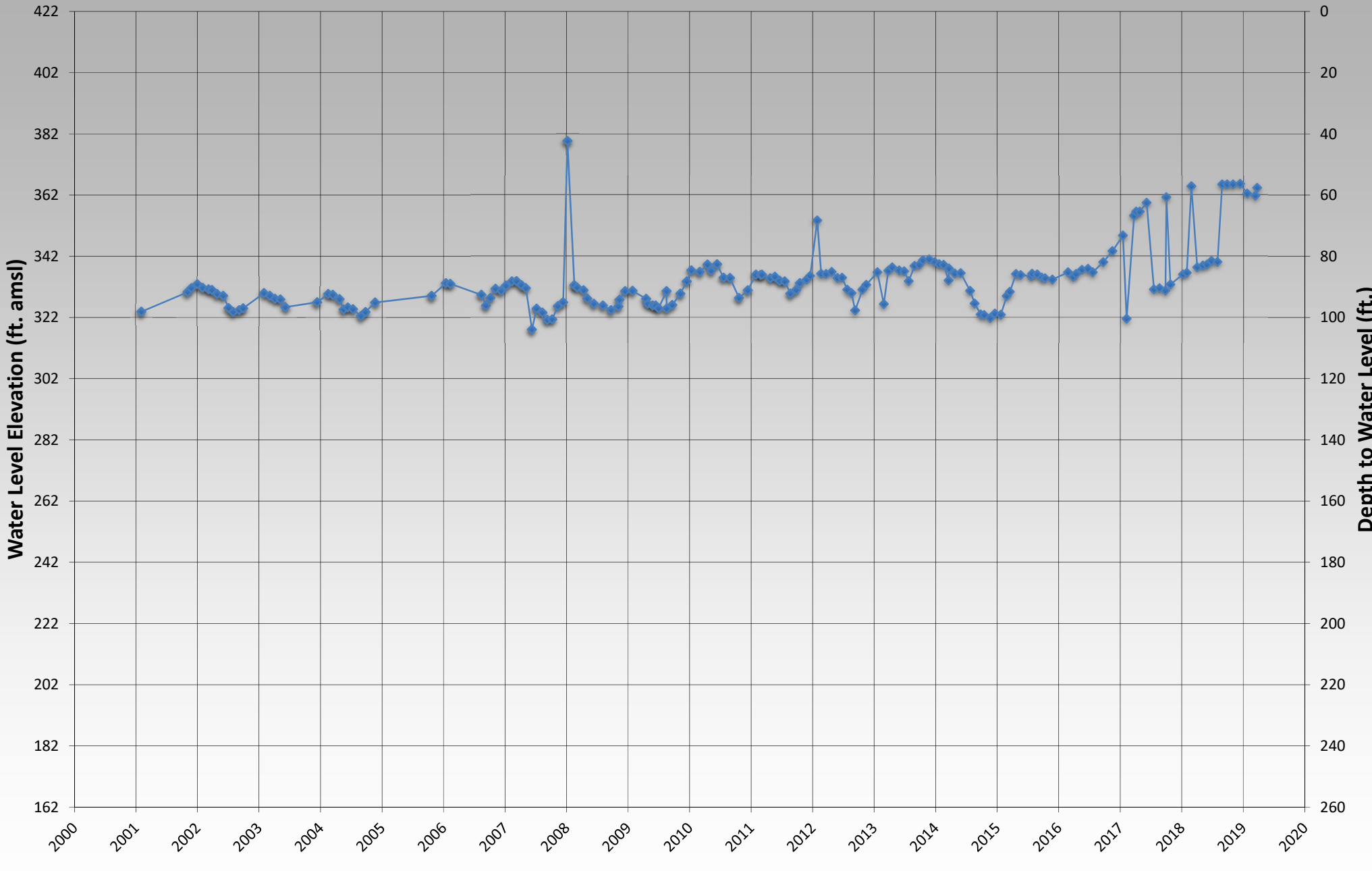


Improvement District No. 4
29S/28E-18K01

Figure 3 - 29S/28E-18K01

GS Elevation 421.9 ft.

KCWA GROUNDWATER DATABASE



Improvement District No. 4
30S/27E-05D01

Figure 4 - 30S/27E-05D01

GS Elevation 374.7 ft.

KCWA GROUNDWATER DATABASE

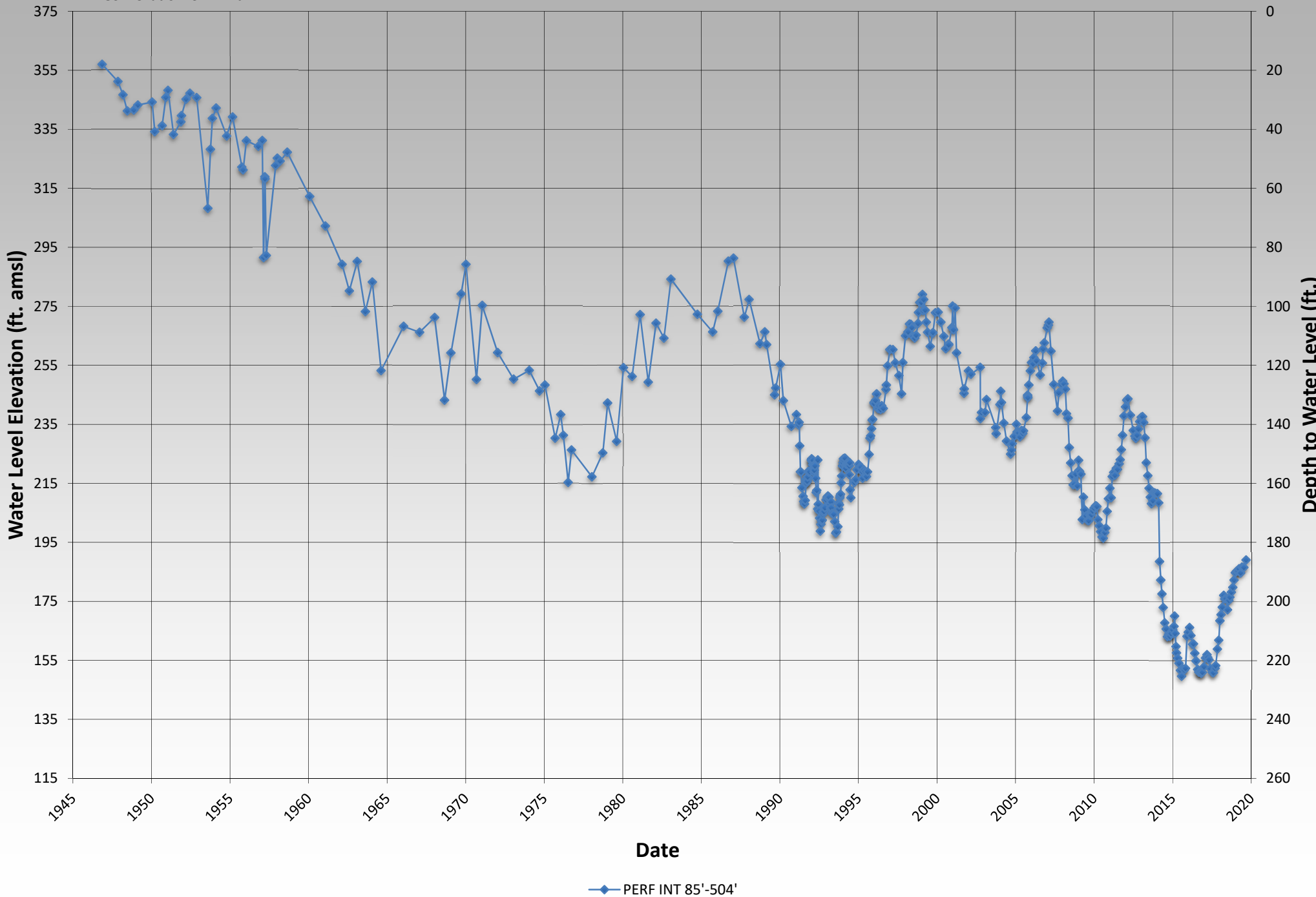
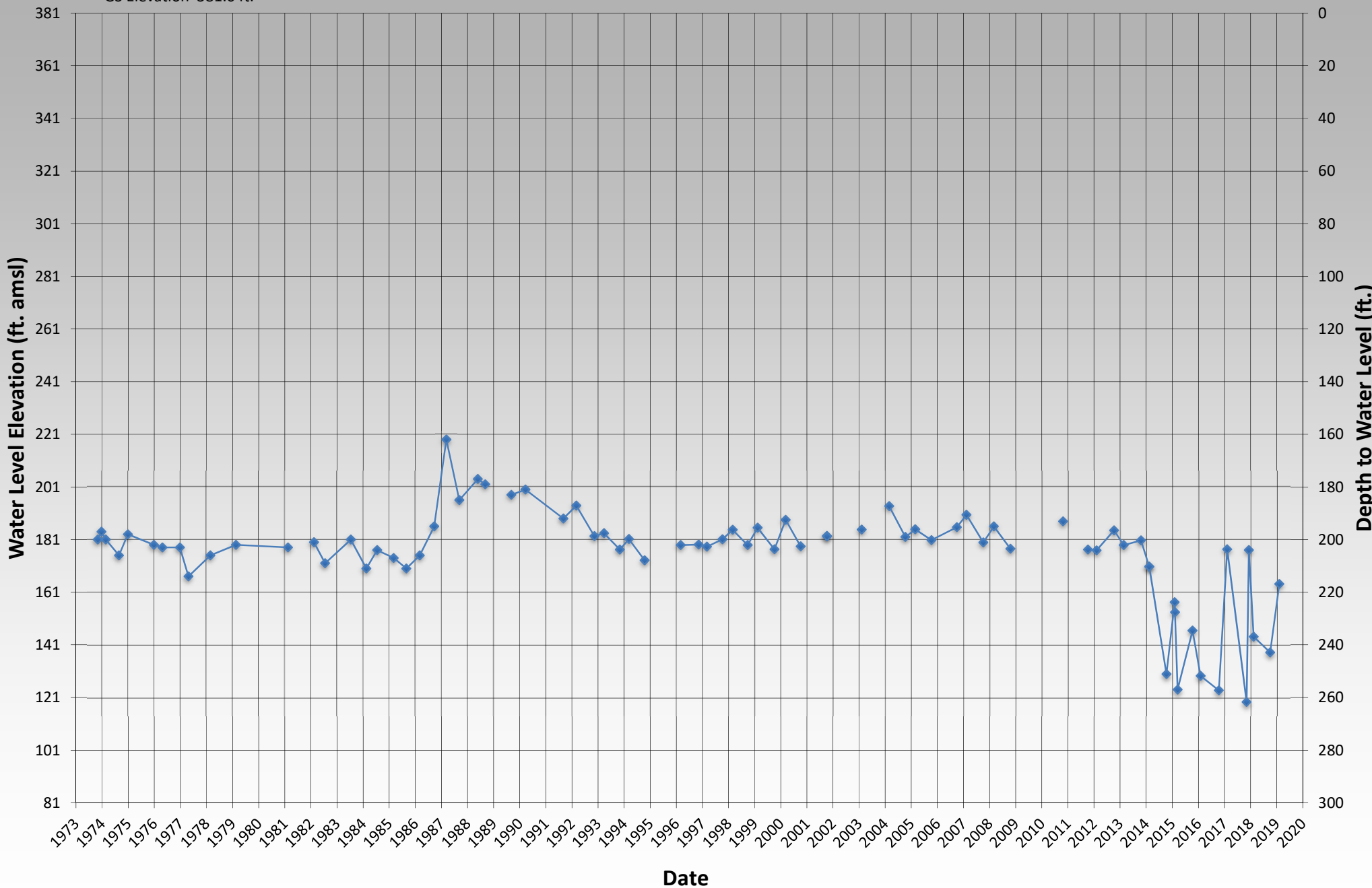


Figure 5 - 30S/28E-03D01

GS Elevation 381.0 ft.

Improvement District No. 4
30S/28E-03D01

KCWA GROUNDWATER DATABASE



IMPROVEMENT DISTRICT NO. 4

T 28 S/R 26 E
T 28 S/R 27 E
T 28 S/R 28 E
T 28 S/R 29 E
T 29 S/R 26 E
T 29 S/R 27 E
T 29 S/R 28 E
T 29 S/R 29 E
T 30 S/R 26 E
T 30 S/R 27 E
T 30 S/R 28 E
T 31 S/R 26 E
T 31 S/R 27 E
T 31 S/R 28 E
T 31 S/R 29 E

N

0 0.5 1 2 3 MILES

SEVEN DITCH
LERDO CANAL
SEVENTH STANDARD RD
FRIANT-KERN CANAL
FIVE DITCH
BEARDSLEY CANAL
FOUR DITCH
NORTH PIPELINE
KERN RIVER
LAKE MING
MAIN CANAL
CALLOWAY DR
CALLOWAN CANAL
COFFEE RD
HAGEMAN RD
ONE DITCH
NORTHWEST FEEDER PIPELINE
CARRIER CANAL
EAST PIPELINE
H ST
OSWELL ST
CALLOWAY CANAL
ALLEN RD
EAST SIDE CANAL
GOOSE LAKE SLOUGH
LAKES AT RIVERWALK
AERA PARK PONDS
KERN RIVER CARRIER CANAL
TRUXTUN LAKES
UNION AV
STOCKDALE HWY
PIONEER MAIN CANAL
CROSS VALLEY CANAL
MING AV
BUENA VISTA CANAL
ARVIN-EDISON CANAL
STINE CANAL
KERN ISLAND CANAL
EAST BRANCH CANAL
CENTRAL BRANCH CANAL
KERN RIVER CANAL
WHITE LN
SEC. 15 DITCH
SEC. 23 DITCH
JAMES CANAL
PLUNKET CANAL
WEST BRANCH CANAL
FARMERS CANAL
STINE CANAL BRANCH 2

99 204 58 178 119

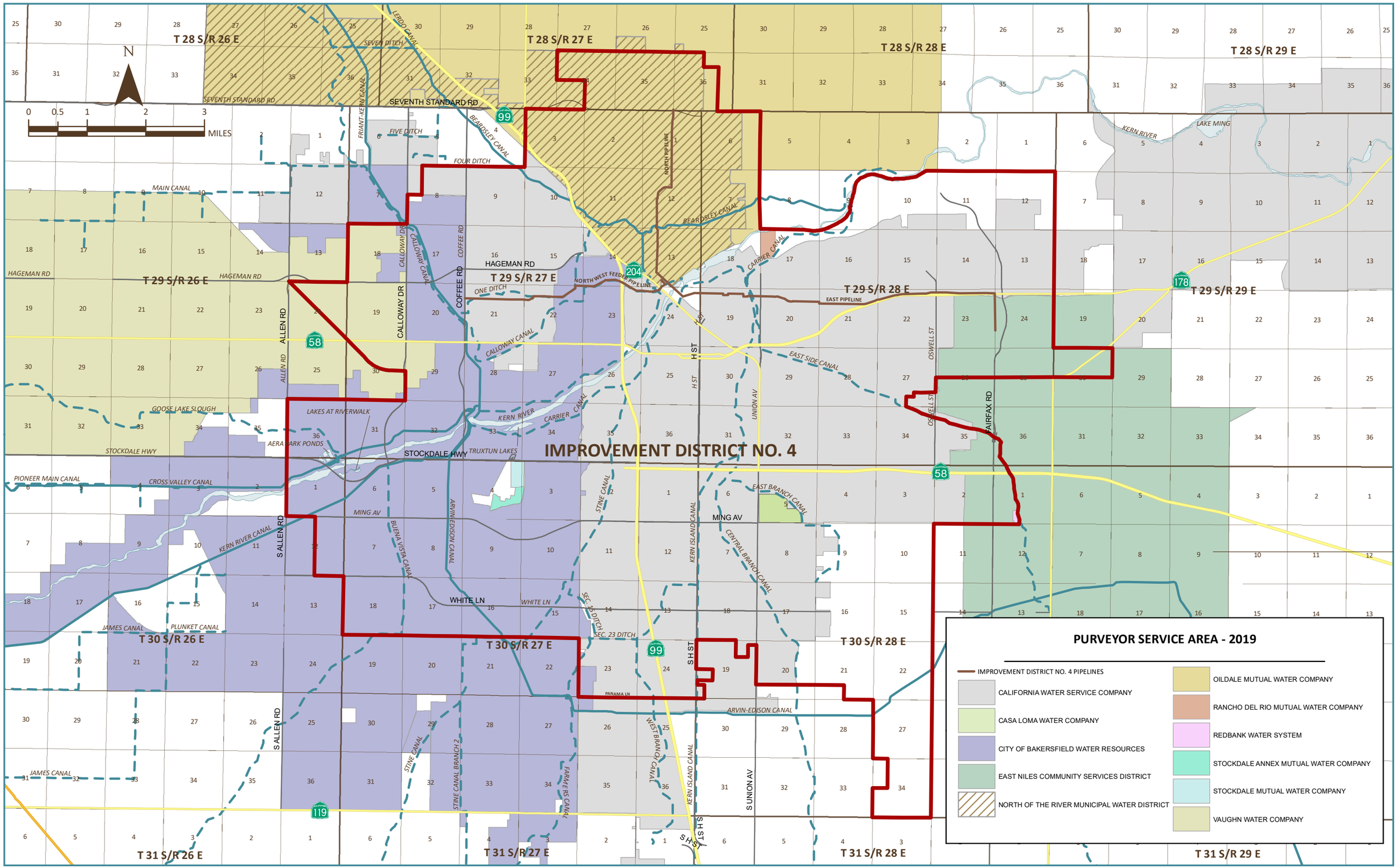
LAND USE - 2019

- UNDEVELOPED
- IRRIGATED AGRICULTURAL
- MUNICIPAL & INDUSTRIAL
- CANAL (LINED)
- CANAL (UNLINED)
- IMPROVEMENT DISTRICT NO. 4 PIPELINES

BY: M. ALLEN
DATE: OCTOBER 22, 2019
REVIEWED BY: M. VARGA
FILENAME: Plate 1 - Land Use (2019).mxd

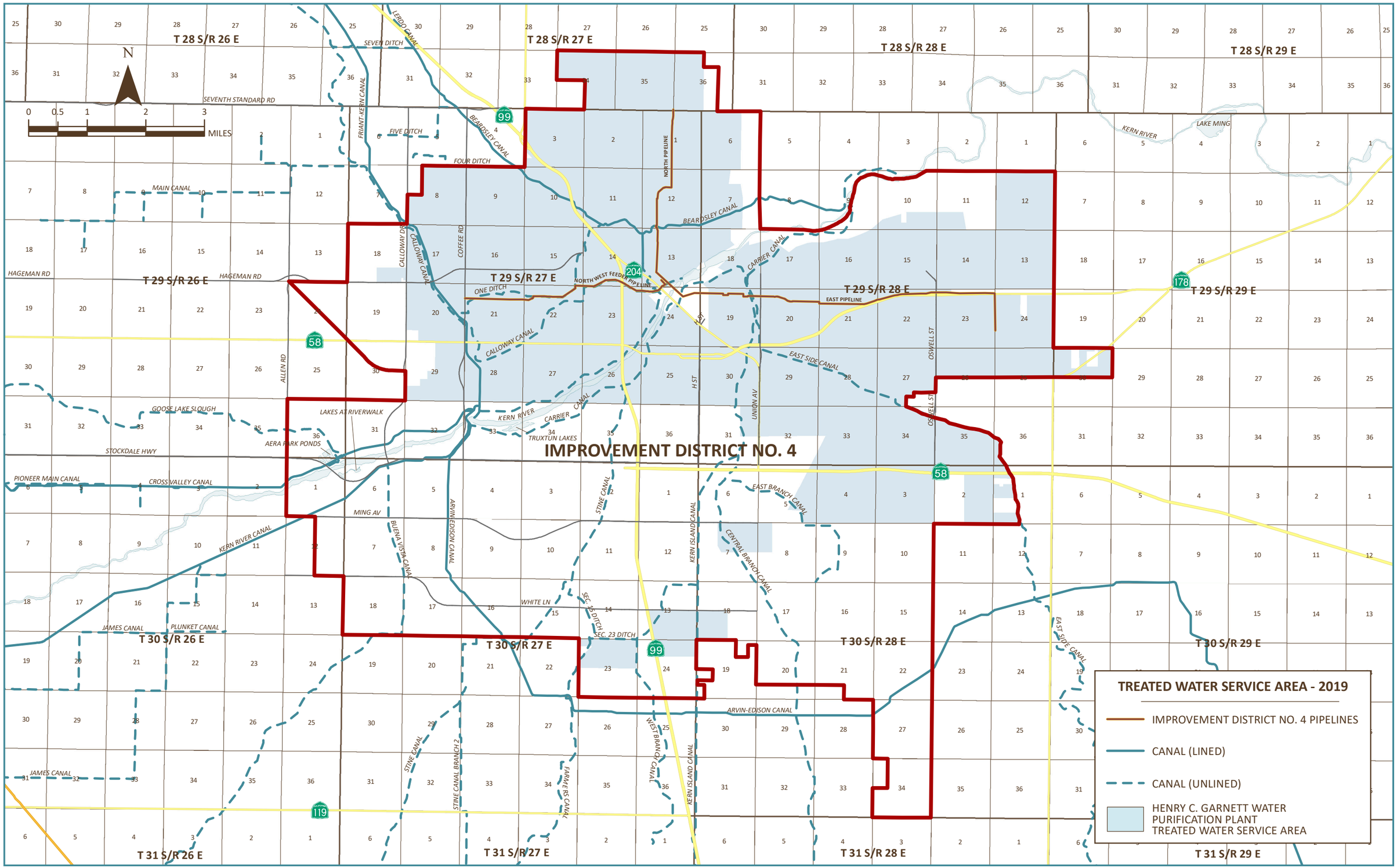
Irrigated agriculture, municipal and industrial areas determined via April 2018 aerial imagery of Kern County and field observations conducted in October 2019.

Plate 1 - Land Use 2019



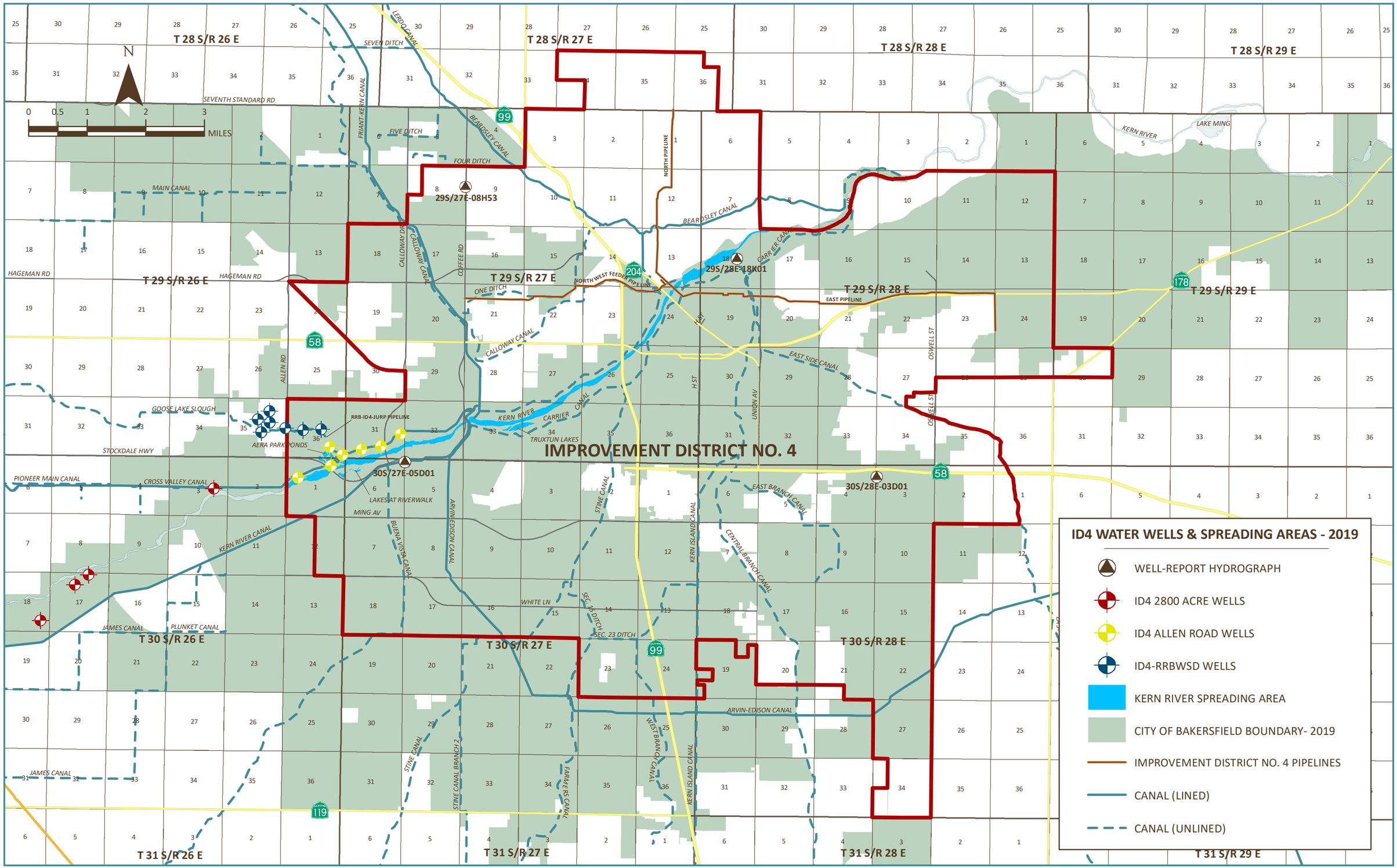
BY: M. ALLEN
DATE: OCTOBER 22, 2019
REVIEWED BY: M. VARGA
FILENAME: Plate 2 - Purveyor Service Area (2019).mxd

Plate 2 - Purveyor Service Area - 2019

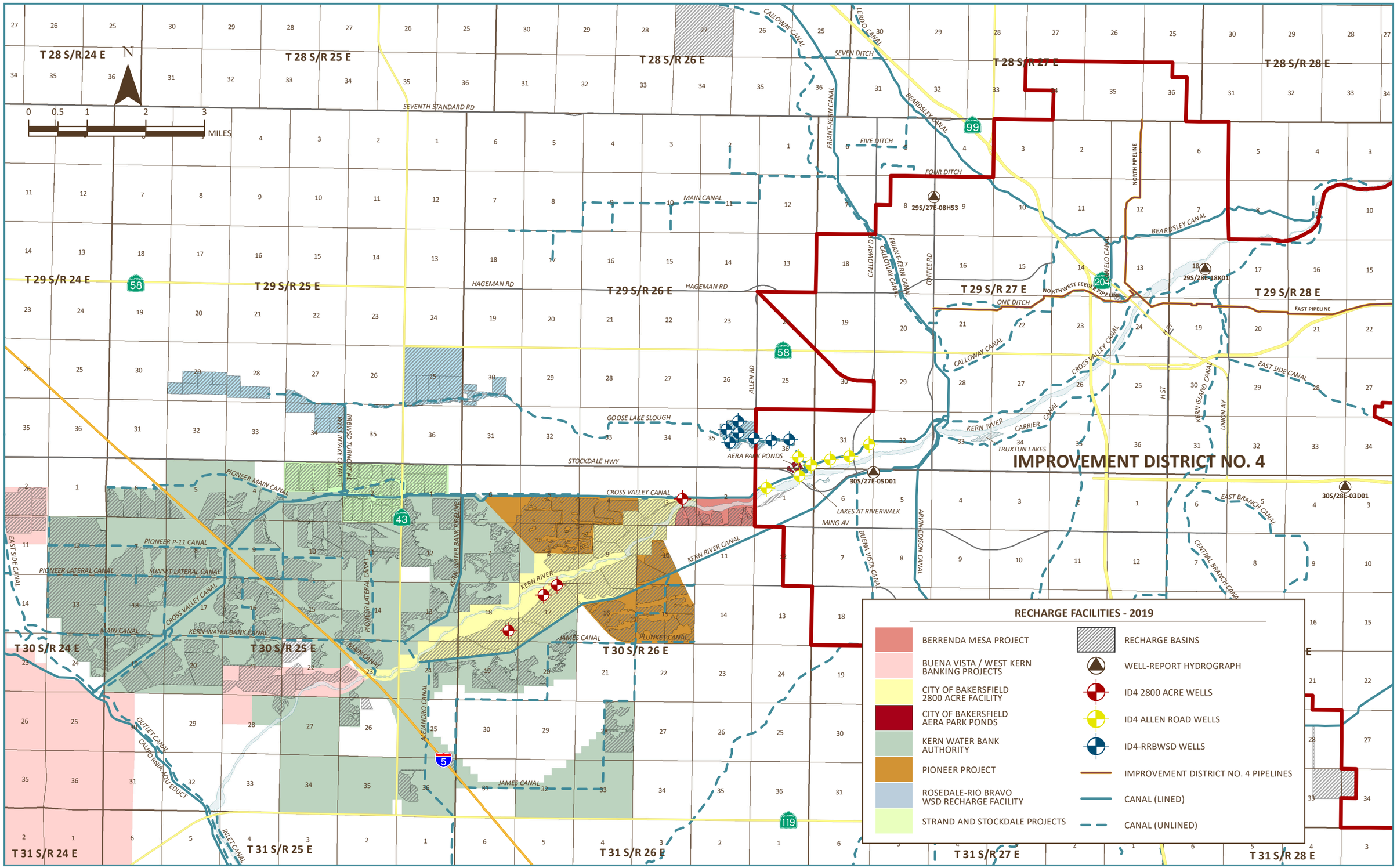


BY: M. ALLEN
DATE: OCTOBER 22, 2019
REVIEWED BY: M. VARGA
FILENAME: Plate 3 - Treated Water Service Area (2019).mxd

Plate 3 - Treated Water Service Area - 2019



BY: M. ALLEN
DATE: OCTOBER 22, 2019
REVIEWED BY: M. VARGA
FILENAME: Plate 4 - Water Wells and Spreading Areas (2019).mxd



BY: M. ALLEN
DATE: OCTOBER 21, 2019
REVIEWED BY: M. VARGA
FILENAME: Plate 5 - Recharge Facilities (2019).mxd

Plate 5 - Recharge Facilities - 2019

ELEVATION OF WATER IN WELLS
SPRING 2019

20 FOOT CONTOUR INTERVAL

100 FOOT CONTOUR INTERVAL

IMPROVEMENT DISTRICT NO. 4 PIPELINES

CANAL (LINED)

CANAL (UNLINED)

CONTOURS BY: MICHELLE ANDERSON, PG #8898

NOTE: CONTOURS SHOWN REPRESENT APPROXIMATE OR INFERRED WATER LEVELS FOR THE TIME PERIOD SHOWN ON THIS MAP. THE READER SHALL BE AWARE THAT WATER LEVELS CHANGE THROUGHOUT THE YEAR. FOR THIS REASON, LEVELS REPRESENTED ON THIS MAP ARE NOT INTENDED TO BE USED FOR SITE SPECIFIC INFORMATION. DASHED CONTOUR LINES INDICATE ESTIMATED VALUES.

IMPROVEMENT DISTRICT NO. 4

T 28 S/R 26 E | T 28 S/R 27 E | T 28 S/R 28 E

T 29 S/R 26 E | T 29 S/R 27 E | T 29 S/R 28 E | T 29 S/R 29 E

T 30 S/R 26 E | T 30 S/R 27 E | T 30 S/R 28 E | T 30 S/R 29 E

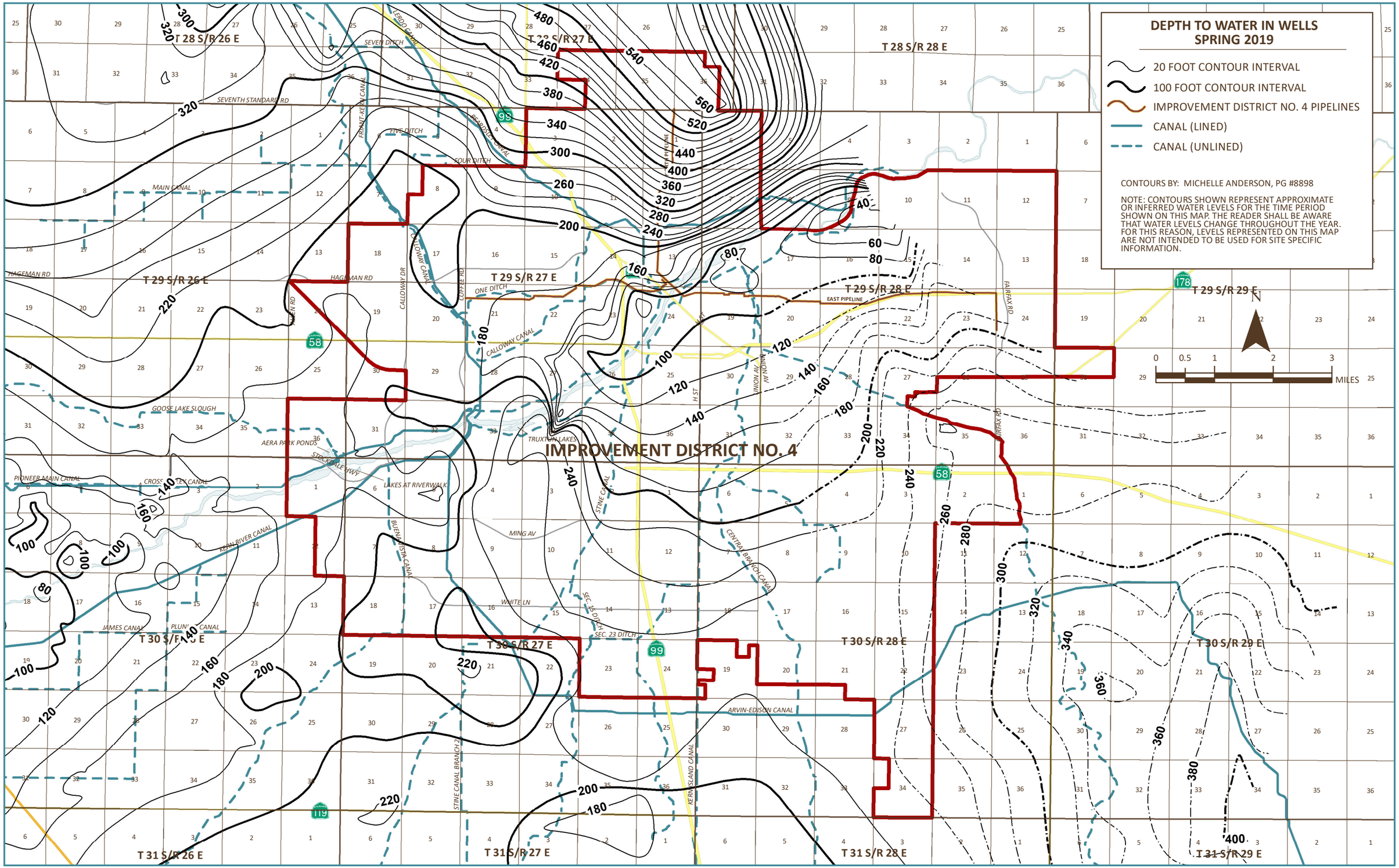
T 31 S/R 26 E | T 31 S/R 27 E | T 31 S/R 28 E | T 31 S/R 29 E

N

0 0.5 1 2 3 MILES

BY: M. ALLEN
DATE: OCTOBER 21, 2019
REVIEWED BY: M. VARGA
FILENAME: Plate 6 - Elevation of Water in Wells (2019).mxd

Plate 6 - Elevation of Water in Wells - Spring 2019



BY: M. ALLEN
DATE: OCTOBER 21, 2019
REVIEWED BY: M. VARGA
FILENAME: Plate 7 - Depth to Water in Wells (2019).mxd

CHANGE IN GROUNDWATER DEPTH SPRING 2018 TO SPRING 2019

20 FOOT CONTOUR INTERVAL

100 FOOT CONTOUR INTERVAL

AREAS WHEREIN SPRING 2019 GROUNDWATER LEVELS WERE 20 FEET OR MORE ABOVE SPRING 2018 LEVELS

AREAS WHEREIN SPRING 2019 GROUNDWATER LEVELS WERE 20 FEET OR MORE BELOW SPRING 2018 LEVELS

IMPROVEMENT DISTRICT NO. 4 PIPELINES

CANAL (LINED)

CANAL (UNLINED)

CONTOURS BY: MICHELLE ANDERSON, PG #8898

NOTE: CONTOURS SHOWN REPRESENT APPROXIMATE OR INFERRED WATER LEVELS FOR THE TIME PERIOD SHOWN ON THIS MAP. THE READER SHALL BE AWARE THAT WATER LEVELS CHANGE THROUGHOUT THE YEAR. FOR THIS REASON, LEVELS REPRESENTED ON THIS MAP ARE NOT INTENDED TO BE USED FOR SITE SPECIFIC INFORMATION.

N

0 0.5 1 2 3 MILES

IMPROVEMENT DISTRICT NO. 4

T 28 S/R 26 E | T 28 S/R 27 E | T 28 S/R 28 E

T 29 S/R 26 E | T 29 S/R 27 E | T 29 S/R 28 E

T 30 S/R 26 E | T 30 S/R 27 E | T 30 S/R 28 E | T 30 S/R 29 E

T 31 S/R 26 E | T 31 S/R 27 E | T 31 S/R 28 E | T 31 S/R 29 E

SEVEN DITCH | LERDO CANAL | SEVENTH STANDARD RD | FRIANT-KERN CANAL | FIVE DITCH | BEARDSLEY CANAL | FOUR DITCH | NORTH PIPELINE | MAIN CANAL | COFFEE RD | CALLOWAY CANAL | HAGEMAN RD | ONE DITCH | EAST PIPELINE | H ST | FAIRFAX RD | OSWELL ST | UNION AV | GOOSE LAKE SLOUGH | ALLEN RD | AERA PARK PONDS | STOCKDALE HWY | PIONEER CANAL | CROSS VALLEY CANAL | LAKES AT RIVERWALK | TRUXTUN CANAL | STINE CANAL | MING AV | KERN RIVER CANAL | BUENA VISTA CANAL | CENTRAL BRANCH CANAL | WHITE LN | SEC. 12 DITCH | SEC. 23 DITCH | S H ST | WASHINGTON ST | S FAIRFAX RD | ARVIN-EDISON CANAL | JAMES CANAL | PLUNKETT CANAL | STINE CANAL BRANCH 22 | KERN ISLAND CANAL

BY: M. ALLEN
DATE: OCTOBER 21, 2019
REVIEWED BY: M. VARGA
FILENAME: Plate 8 - Change in Groundwater Depth (2019).mxd

Plate 8 - Change in Groundwater Depth - Spring 2018 to Spring 2019