



2023 ANNUAL ENGINEERING REPORT





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1.0 INTRODUCTION

Located south of the City of Bakersfield and south of the Kern River, the Kern Delta Water District (District) was organized in December 1965 to contract with the Kern County Water Agency (KCWA) for an imported water supply from the State Water Project, and to protect existing Kern River water rights. In 1976, the District acquired the Kern Island Water Company from the City of Bakersfield (City) which excluded the Ashe Water Service Area per Agreement 76-70 “Agreement for the Sale of Kern River Water Rights and Canals” (Agreement). From the Agreement, the District garnered water rights to five service areas: Buena Vista, Stine, Farmers, Kern Island, and the Eastside, along with the respective canal distribution facilities, summarized in Table 1. The District realized early on that Improvements to canal distribution facilities were necessary to maintain continued efficient and reliable operation to meet water user requests.

Table 1: Canal Distribution System

Canal System	Canal Lengths in Miles			Turnouts
	Main	Laterals	Total	
Buena Vista	17	7	24	65
Stine	13	4	17	42
Farmers	11	12	23	31
Kern Island	24	42	65	300
Eastside	20	0	20	79
Total	84	65	149	517

Over the years, the District made concerted efforts to improve the canal distribution systems, seek out and develop water partnerships in response to the growing need to store (bank) water in the San Joaquin Valley during years with above average precipitation, and recover banked water during periods of drought or years with increased irrigation demands. The District has developed a water banking partnership with The Metropolitan Water District of Southern California (MWD) which consists of the construction of conveyance facilities, banking facilities, pipeline and delivery systems, and groundwater extraction wells.

The importance of banking water increased due to the steady decline of groundwater levels and the implementation of the Sustainable Groundwater Management Act (SGMA) of 2014. The landmark law requires locally established Groundwater Sustainability Agencies (GSAs) to implement Groundwater Sustainability plans (GSPs) tailored to their respective management areas. The goal of GSPs is to demonstrate a path to sustainability by the year 2040. The District joined with the City of Bakersfield, Improvement District No. 4 of KCWA, and local agencies in and around the City to form the Kern River Groundwater Sustainability Agency (KRGSA).

The District compiles an annual report to highlight some of the major developments and improvements within the District over the course of the year. This year’s Annual Engineering Report (Report) captures activities for the 2023 calendar year. With the District’s continued commitment to provide a reliable and efficient means of delivering water to its customers, the Report also details maintenance and repair activities, and potential future capital improvement



projects. The Report also highlights alterations to District facilities to accommodate the continued urbanization of the City of Bakersfield and further development of water banking projects.

As there are many improvement projects currently in the planning stages, this Report also includes a preliminary Capital Improvement Plan (CIP) for the purposes of identifying projects that will enhance the District's ability to deliver safe and dependable water supply to its customers and improve its banking projects. The CIP summarizes some of the future construction efforts that will be undertaken by the District, including the construction of banking facilities, groundwater extraction wells, groundwater monitoring wells, and the rehabilitation of District conveyance facilities.



2.0 OPERATIONS

2.1 Operations Overview

The District's main water supply comes from the Kern River (pre-1914 appropriative rights acquired through Agreement 76-70), with an approximate long-term average of 205,000 acre-feet per year (af/yr). Other water supplies available to the District include 25,500 af/yr of State Water Project Table A water (long term average of approximately 16,000 af/yr), Friant high flow water when available, and groundwater. In addition to managing its vast canal distribution system, the District also manages approximately 1,122-acres of groundwater banking facilities, and twenty groundwater extraction wells (see sections 3.2 and 3.3 respectively of this report for further details). Table 2 below summarizes the water year in percent of historical average and the amount of banked water in those years. The values shown do not include water banked due to operational recharge in District canals.

Table 2

Water Year	%	Spreading Basins ¹ (acre-ft)	Grower Recharge ² (acre-feet)	Total Banked Water (acre-feet)
2015	19	-	-	-
2016	51	-	-	-
2017	278	59,939	10,000	69,939
2018	60	8,840	-	8,840
2019	175	53,432	-	53,432
2020	54	9,886	-	9,886
2021	22	849	-	849
2022	30	1,518	-	1,518
2023	321	72,622	-	72,622

2.2 Transfer Water

In 2017, the District reached a settlement with The City of Bakersfield and North Kern Water Storage District (Ventura County Superior Court Case NO. 65-2012-00425941-CU-WM-VTA) relating to the District's Kern River Water Allocation Plan and the use and disposition of Kern River water accruing to certain Kern River water rights owned by the District. Although this Report is not intended to summarize the settlement, it is important to note that the District's implementation of the Kern River Water Allocation Plan allows the District greater flexibility to fully utilize District river entitlements.

The ability to more fully utilize the District's river entitlements requires the District to ensure all canals are always in good operating condition for operation on short notice. Prioritizing facility

¹ Spreading basins owned and operated by the District.

² 2017 marks the first time the District paid landowners within the District to recharge water on private land.



improvements around this new reality will require accelerated project schedules during canal shutdown periods, especially in December of each year. The use of outside contractors to ensure all projects are completed within available shutdown windows is a tool the District may utilize more heavily in this new norm. Depending on the type of year and the amount of transfer water available, if necessary, secondary canals may be shut down for two to three-week intervals at various times of the year to perform necessary maintenance projects.

Historically, the District hired seasonal canal tenders between March and August. As peak irrigation demand tapered off (peak irrigation demand usually occurs in June and July), these seasonal employees were either retained or let go, depending on the District's needs. The District now keeps its canal tenders year-round and is always prepared to operate all canals and banking projects throughout the year. Calendar year 2018 represents the first year in which these new procedures were used. The District is maximizing the amount of water available for its use and has adjusted maintenance and operation demands accordingly.

2.3 Record Water Year

The 2023 water year was a historically wet year for agricultural water districts in the San Joaquin Valley, bringing relief from drought but also presenting challenges, such as flooding. With above-average rainfall and snowpack, the primary outcome was a prolonged operational season combined with a significant increase in groundwater recharge efforts. Diverting abundant supplies to replenish underground aquifers, is a vital component of long-term groundwater management.

The U.S. Army Corps of Engineers (USACE) completed the Isabella Dam modifications in 2022, with Phase II substantially finished by October 2022, and the risk rating was officially lowered to "low urgency" in 2023. This completion is relevant to the 2023 water year because it enabled the USACE to lift the 361,00 acre-feet operating restriction, allowing the lake to reach its full capacity for the first time in years providing vital flood risk reduction for downstream communities. This was especially critical for the 2023 water year, which saw the Department of Water Resources B-120 forecasts in April and May exceeding 400% of average.

For the first time since 1997, the long-dormant Tulare Lake returned to the Corcoran area due to atmospheric rivers and record snowmelt, submerging vast tracts of farmland and causing flooding. The "ghost lake" inundated thousands of acres of crops and threatened homes, leading to a state of emergency and a large engineering effort to reinforce the Corcoran levee to protect the city and its prisons.

During 2023, the Kern River-California Aqueduct Intertie was activated to divert 24,560 af of high flow from the Kern River into the California Aqueduct to prevent it from flowing into Tulare Lake and causing damage. Kern River flood waters moved through the Outlet Canal near Tupman, California into Tulare County but never reached Tulare Lake. The historic water supply resulted in a 100% allocation from the State Water Project (SWP) for the first time since 2006. These circumstances resulted in record surface water supply availability throughout the subbasin.

The 2023 Water Year proved to be historic with the Kern River producing 2,324,823 acre-feet, making it the fourth wettest water year on record. The April-July runoff was the second wettest on



record, producing 1,597,750 acre-feet. Managing the high flows proved to be challenging not only from flooding potential but also from increased sediment loading, particularly the Buena Vista and Stine Canals.



3.0 CURRENT CONSTRUCTION PROJECTS

3.1 Conveyance Facilities

As shown in Table 1, the District owns and operates approximately 149-miles of canals that date back to the late 1800's when individual canal companies were formed (Stine Canal Company, Buena Vista Canal Company, Farmers Canal Company, Kern Island Irrigating Canal Company, and Eastside Canal Company). The District has made concerted efforts to rehabilitate and expand facilities to maintain and enhance capacity for deliveries.

With many new farming entities, new cropping patterns, and aging water delivery structures, the District has endeavored to provide quality weirs and turnouts to accommodate a changing industry. The District must also adapt to increasing urbanization of agricultural lands within its boundaries. Urbanization causes District facilities to be realigned, pipelined, or both, and possibly abandoned altogether. In 2023, several improvements were made to District facilities, some by the District, others by private and public entities.

3.1.1 PG&E Utility Bridge Removal – Eastside Canal

PG&E built a utility bridge in the late 1940's to carry fourteen electrical conduits across the Eastside Canal as shown in Photo 1 below. By the time the District reconstructed the east bank of the Eastside Canal in 2013, it became evident that the utility bridge was falling into disrepair and becoming a haven for the homeless. As only four of the fourteen conduits were active, PG&E and the District began discussing the abandonment of the utility bridge. The abandonment of the utility bridge required PG&E to obtain an overhead powerline easement from the District, coordinate the location of the new utility poles, and remove the bridge abutments and pier. The various stages of the removal process are shown in Photos 2 through 5 below.



Photo 1: PG&E utility bridge, circa 2013



Photo 2



Photo 3



Photo 4



Photo 5

3.1.2 Replacement of 13 Ditch Return Overflow Structure and Pipeline at Shafter Road

The 13 Ditch Return Canal's primary function is to regulate the water level in the 13 Ditch Main Canal via an overflow box structure just north of Shafter Road as seen in Photo 6 below. When the water level gets too high, the water will overtop the box structure, flow through a 24" Corrugated Metal Pipeline (CMP) into an open canal and then flow into the Kern Island Main Canal. In early 2023, the CMP failed at Shafter Road and thus needed replacement. While the District typically will not replace road crossings, due to the timing of the failure and the need to have both the 13 Ditch Main Canal and 13 Ditch Return Canal operational for its growers, the District took this opportunity to replace the pipeline and redesign the overflow structure as shown in Exhibit 13. Photos 7 through 12 show various stages of construction.



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10

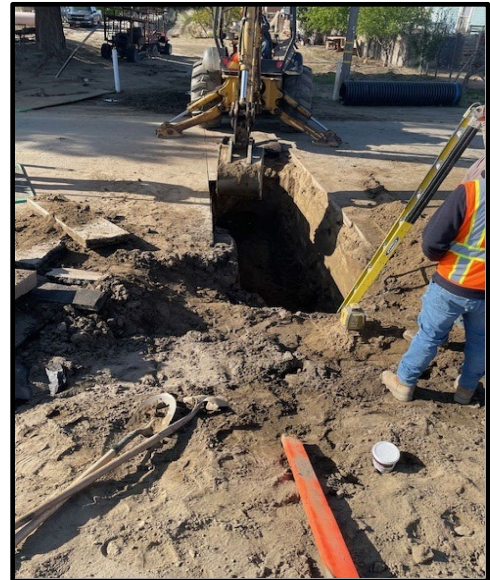


Photo 11



Photo 12



Photo 13



3.1.3 Kern Island Box Culvert Extension at Taft Highway

In 2020, engineers on behalf of Love's Truck Stop reached out the District to discuss solutions to accommodate an increase in traffic due to a proposed new truck stop on the northeast corner of Taft Highway and South "H" Street. Two options that were discussed were a potential bridge crossing the Kern Island Canal, approximately 170' north of Taft Highway, or extending the existing culvert farther north. Love's decided to extend the existing box culvert approximately 18' north to accommodate a right turn pocket. In addition to the reviewing the "Offsite Street, Sewer, and Storm Drain Plans", which included the box culvert extension and most of the proposed utility crossings of the Kern Island Canal, the District also reviewed the "New Travel Stop Water Main Extension Plan", which proposed a water pipeline to cross underneath the Kern Island Canal. After the District completed its review and approval of the plan sets and agreements were finalized and a Common Use Agreement was developed to allow the project to move forward. The culvert extension was completed during the 2023 Kern Island shutdown period. Photos 14 through 19 show the various stages of construction.



Photo 14



Photo 15



Photo 16



Photo 17

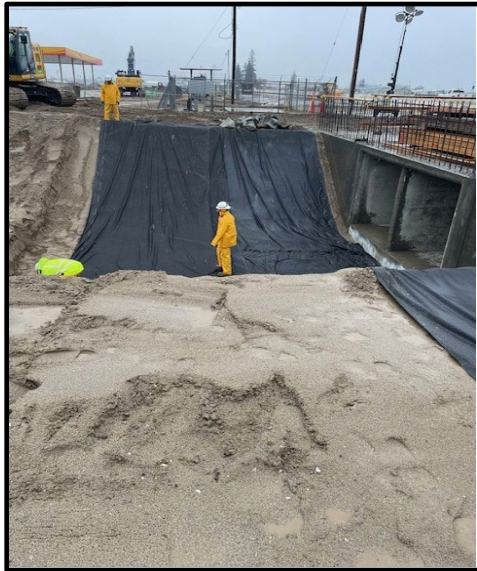


Photo 18



Photo 19

3.1.4 Forrest Frick Pipeline Eastside Canal Intertie

In 2022, Arvin-Edison Water Storage District (AEWSD) began to prepare plans for an intertie structure capable of transferring 40 cfs from their Forrest Frick Pipeline and Kern Delta Water District's Eastside Canal. The intertie structure is located approximately $\frac{1}{4}$ mile south of Muller Road and a $\frac{1}{4}$ mile west of Highway 184. The project was approved after going through Kern Delta Water District's review process. The Forrest Frick Pipeline Eastside Canal Intertie was completed and tested by the end of January 2023. Photos 20 through 22 show the various stages of construction and photos 23 and 24 show the intertie running water.



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24

3.1.5 Canal Dredging – Multiple Locations.

In 2023, the District dredged approximately 32,248 linear feet of canal. Table 3 below summarizes the canal, locations, and approximate length of canal dredged. While the District typically waits until the end of the season to dredge its canals, due to increased river flow (2023 was the second wettest April through July runoff), sediment build up in the canals also increased. The sediment build up in the Buena Vista Canal just below the head of the canal, was so bad that the District started dredging the canal in June of 2023. Photos 25 through 35 show the various dredging efforts.

Table 3: Dredging locations

Facility	Location	Linear Feet	Year
Kern Island Main Canal	Split	2,660	2023
Central Branch Canal	Split	792	2023
Stine Canal	New Stine Road to Grissom Street	2,451	2023
Branch One Canal	White Lane to Highway 99	1,452	2023
Kern Island Main Canal	South of Planz Road to Railroad	1,155	2023
Rim Ditch	KI Drain to 551	14,592	2023
Kern Island Drain Canal	East of Union to Rim Ditch	7,791	2023
Buena Vista Canal	Stockdale to Howell Drive	1,355	2023
Total		32,248	



Photo 25: Buena Vista Canal



Photo 26: Buena Vista Canal



Photo 27: Head of Buena Vista, looking south.



Photo 28: Kern Island, looking north from KI/Central split weir



Photo 29: Kern Island, looking south from 4th Street



Photo 30: Central Branch, looking north from Brundage Lane



Photo 31: Branch Once Canal, look south from White Lane



Photo 32: Branch One Canal, looking southwest towards Highway 99



Photo 33: Kern Island, looking south from Planz Road.



Photo 34: Rim Ditch, looking east.



Photo 35: Rim Ditch, looking east



3.1.6 Eastside Canal at Buena Vista Boulevard

The Buena Vista Boulevard crossing of the Eastside Canal consisted of three corrugated metal pipes. In December 2022, District staff informed the Kern County Roads Department (County) that the Buena Vista Boulevard crossing of the Eastside Canal was starting to fail. In particular the center pipe at the south headwall, as seen in photo 36 below, and requested the County's plan for replacement. The District also put the County on notice that, should the crossing fail, while the District was running water, the District would remove the crossing and continue to flow water. In February 2023, the District informed the County that a sinkhole was forming behind the southerly headwall as seen in photos 37 and 38. By middle of March, the County performed a hard closure of Buena Vista Boulevard and by the end of March, the Buena Vista Boulevard crossing completely failed. On March 27th, the District removed the corrugated metal pipes (leaving the headwalls intact), shaped the canal and installed rip-rap protection along the sides of the canal (see photos 40 and 41). By March 29th, the Eastside Canal was flowing water again (see photo 42), and was able to flow the entire season. The District and the County are working together on a replacement strategy (timing, size of culvert, etc.). The complete culvert replacement is expected in early 2024.



Photo 36: Center culvert pipe, looking north.



Photo 37: Eastside Canal crossing at Buena Vista Blvd, looking east.



Photo 38: Close up of sinkhole, south headwall.



Photo 39: Buena Vista Blvd closure.



Photo 40: Crossing removed, canal shaped, looking south.



Photo 41: Rip-rap installed, looking south.



Photo 42: Eastside Canal flowing again, looking north.

3.1.7 Supervisory Control and Data Acquisition (SCADA)

In 2021, the City of Bakersfield installed a Supervisory Control and Data Acquisition (SCADA) system at the heads of four District canals: The Buena Vista Canal, the Stine Canal, the Kern Island Canal, and the Eastside Canal. This system allowed the City to remotely monitor head gate flows and make adjustments in real time. With the success of the City's SCADA project, the District sought to implement its own SCADA Project, expanding upon what the City initiated, and began identifying and evaluating key locations for its SCADA system. The District finalized seven locations, summarized in Table 4 below.

Table 4: SCADA locations and measurement type

Canal	Location	Type of Measurement
Kern Island	Weir No. 631	Flow – Overpour
Kern Island Central Branch	Weir at Head	Flow – Overpour
Kern Island	Weir No. 631A	Flow – Pipe discharge
Rim Ditch	Weir No. 551	Flow – Pipe discharge; depth
Branch 1	Weir at Head	Flow – Overpour
Eastside	Weir at Di Giorgio	Flow – Pipe discharge; depth
Kern Island	Weir at Met Backup	Flow – Pipe discharge; depth



Photo 43: Head of Branch One

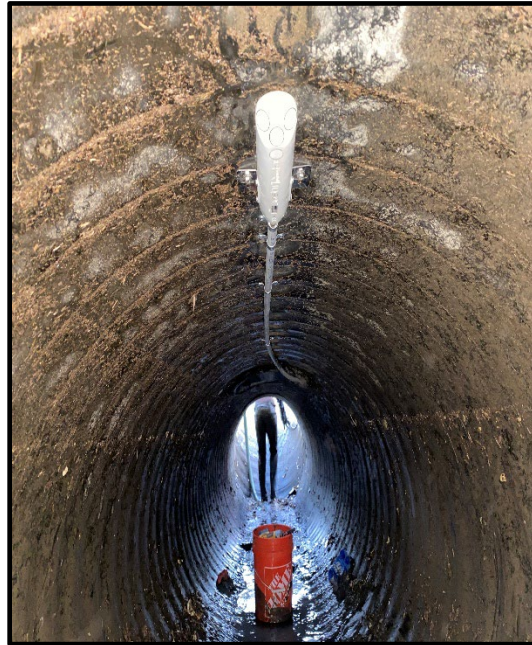


Photo 44: Typical pipe flow measuring set up.

3.2 Groundwater Banking Facilities

The District owns and operates approximately 1,122 gross acres of groundwater banking facilities located along the Kern Island Canal, Branch One Canal, Buen Vista Canal, Stine Canal, Farmers Canal, Smith Judd Canal, and Eastside Canal as shown in Exhibit 1. Table 5 summarizes the District's groundwater banking projects.



Table 5: Kern Delta Water District Groundwater Banking Projects

Banking Facility	Location	Year Constructed	Total Area (Gross Acres)	Spreading Capability (ac-ft/day)	2017 Observed Infiltration (ac-ft/day)
Kern Island Basins	NE Corner of Houghton and South “H” Street	2008	175 ³	70	37
Stine Basins	Stine Canal, South of Taft Hwy	2009 & 2010	40	19	23
Stonefield Basins	Smith Judd Canal, north of Bear Mt. Blvd	2010	79	22	25
Buena Vista Basins	Buena Vista Canal, north of Taft Highway	2010	227	157	91
Romero Basins	Between Ashe Rd and Stine Rd, North of Romero Rd	2015	165	67	45
Howard Frick Basins	Eastside Canal, south of Di Giorgio Road	2015	70	19	21
Houchin Pit	Buena Vista East Canal, North of Bear Mt. Blvd	2010	72	14	14
Branch One Basins	Branch One Canal, north of Curnow Road	2018	74 ⁴	TBD	N/A
Sunset Basins	NW corner of Sunset Blvd and Edison Road	2022	75 ⁵	TBD	N/A
Old River Basins	NE corner of Old River Road and Taft Hwy	2023	144	TBD	N/A
Totals			1,122	368	256

3.2.1 Kern Island Basins

Located on the northwest corner of South “H” Street and Houghton Road, the Kern Island Basins Project was the first groundwater recharge facility built by the District. The original facility consisted of 157 acres, six ponds, and four groundwater extraction wells. In 2020, the District purchased an additional 19 acres to the north of the existing basins as shown in Exhibit 2. The additional property became the seventh pond at the Kern Island Basins and came with an existing well. After further review, the District will either abandon this well or convert it into a monitoring well. The construction of Pond 7 was completed in 2021, with the District installing a new turnout from Pond 1 to Pond 7 later that year.

3.2.2 Branch One Basins

The Branch One Basins, located at the terminus of the Branch One Canal, north of Curnow Road, were completed in 2018, totaling 66 acres. This groundwater recharge facility consists of two ponds, one to the north of the Branch One Canal, and one to the south of the canal as shown in Exhibit 3. The District acquired an additional 9 acres immediately east of Pond 2 in 2020. The

³ Includes an additional 19 gross acres the District acquired in 2020

⁴ Includes an additional 9 gross acres the District acquired in 2020

⁵ This is a joint project with AEWS. The total project size is 150 gross acres; of which 75 are attributable to the District’s total recharge area.



District incorporated the additional acreage into Pond 2 by removing the eastern levee of Pond 2, and reconstructing it along the eastern property line and consequently extending the southern levee further east. The existing groundwater well located on the northern end of Pond 1 will either be converted into a monitoring well or abandoned after further review by the District. The Branch One Basins Expansion was completed in early 2021.

3.2.3 Romero Basins

The Romero Basins recharge facility is a 165-acre facility, located on the Farmers Canal between Ashe Road and Stine Road, and north of Romero Road (see Exhibit 4). It consists of nine ponds and one groundwater extraction well. The main facility, Ponds 1 through 7 were completed in 2015. During the high-water flow year of 2017, the District constructed Pond 8 to serve as an overflow pond and made slight modifications to Pond 9. The modifications to Pond 9 included taking out an old booster pump and a portion of the pump stand to facilitate water movement to the southern portion of this pond. In 2021, the District hired a contractor to flatten and level the bottom of Pond 9 and maximize the wetted area to the north. The project created a below grad recharge bond and the excess soil was used to build a berm surrounding the pond. The excess soil could be removed at a future date if needed for other projects. The Pond 9 project was completed in July 2021. As mentioned, the site has one groundwater extraction well, FR-02, which is plumbed into the Farmers Canal and the Randall Ditch. No further groundwater extraction wells are planned for the Romero Basins.

3.2.4 Stonefield Basins

Completed in 2010, the Stonefield Basins consists of four ponds on 79-acres, north of Bear Mountain Boulevard and east of the Smith Judd Canal. The Stonefield Basins can return flow back to the Smith Judd Canal via a return structure in Pond 3 as shown in Exhibit 5. As no return to the Smith Judd Canal exists in Pond 4, the water level in Pond 4 needs to always be less than a foot so it can serve as a capture pond in the event a levee breaches or the water level gets too high in Ponds 1 through 3. The current groundwater extraction well, FR-01, located on the northwest corner of Pond 1, will either be converted into a monitoring well, plumbed into the Smith Judd Canal, or abandoned altogether after further review by the District.

3.2.5 Buena Vista Basins

The Buena Vista Basins are currently the District's largest groundwater recharge facility at 227-acres, ten ponds, and four groundwater extraction wells (see Exhibit 6). The Buena Vista Basins were completed in 2010, the same year as the Stonefield Basins.

3.2.6 Houchin Borrow Pit

The Houchin Borrow Pit is located on the northwest corner of I-5 and Bear Mountain Boulevard as shown in Exhibit 7. While the Houchin Borrow Pit is extremely deep and has a large capacity,



the infiltration rates are very low. Care needs to be taken so that once the Houchin Pit is full, the inflow rate needs to be very low.

3.2.7 Stine Basins

The three groundwater recharge basins south of Taft Highway are collectively known as the Stine Basins. The first basin, the Stine Regulating Basin, is approximately ½ mile south of Taft Highway. The North and South Triangle Basins are located where the Stine Canal intersects Houghton Road (see Exhibit 8).

3.2.8 Old River Basins

Located on the northeast corner of Old River Road and Taft Highway, the Old River Basins is a 144 acre facility consisting of four ponds, and one existing well. The District is planning to add two more wells (see Exhibit 11). While not shown on Exhibit 12, the Old River Basins also include an erosion control bench to mitigate levee erosion when the District is banking water. In addition to constructing four ponds, the District also built two additional well pads for future wells, installed a culvert crossing to allow easier access to both sides of the facility, and improved the canal section through the site. Construction of the basins began in March 2023 with Pond 4, and by April 2023, Pond 4 was used as a bypass to allow the District to finish improvements on the canal and install outlet structures from Ponds 2 and 3 into the canal. Photos 45 through 52 show the various stages of construction.



Photo 45: Pond 4 construction, looking north.



Photo 46: Preparation for road crossing.



Photo 47: Road crossing culvert, looking south.



Photo 48: Inlet to Pond 1



Photo 49: Canal improvement, North of weir.



Photo 50: Stine Canal and Old River Pond 4.



Photo 51: Canal improvement south of weir, looking north.



Photo 52: Canal improvement south of weir, looking south.



Photo 53: Canal and Pond 4 in use.



3.2.9 Howard Frick Recharge Basins

Formerly the Di Giorgio Bains, the Howard Frick Recharge Basins are located on the southwest corner of Di Giorgio Road and the Eastside Canal. This 70-acre site consists of six ponds, with the ability to return flow to the Eastside Canal from Pond 2 (see Exhibit 9). Pond 2 is also capable of accepting surge flow from the Eastside Canal via a control structure located south of Di Giorgio Road.

3.2.10 Sunset Banking Project

The Sunset Banking Project is a joint groundwater recharge project between Kern Delta Water District and Arvin-Edison Water Storage District comprising 150-acres of land on the northwest corner of Sunset Boulevard and Edison Road. As shown in Exhibit 10, the Sunset Bains consists of four ponds, with Pond 4 capable of gravity inflow, a pump station and a 36-inch diameter pipeline on the northern edge of the property to pump water from the canal and either into Pond 1 or Pond 2.

With the construction of the pond levees, inter-basin structures, and the gravity inlet/outlet structure into Pond 4 complete, the project moved into the next phase, which included the construction of the pump inlet, structure pumping station, installation of the main 36-inch diameter pipeline, installation of two discharges, one into Pond 1 and the other into Pond 2. Overhead power supply to the pump station as well as installation of the three pumps is expected to be completed in early 2024. Photos 54 through 66 show the various stages of construction



Photo 54: Installation of discharge into Pond 1



Photo 55: Discharge into Pond 1



Photo 56: Pump inlet construction.



Photo 57: Pump House arrives on site.



Photo 58: Setting Pump House.



Photo 59: Pump House set.

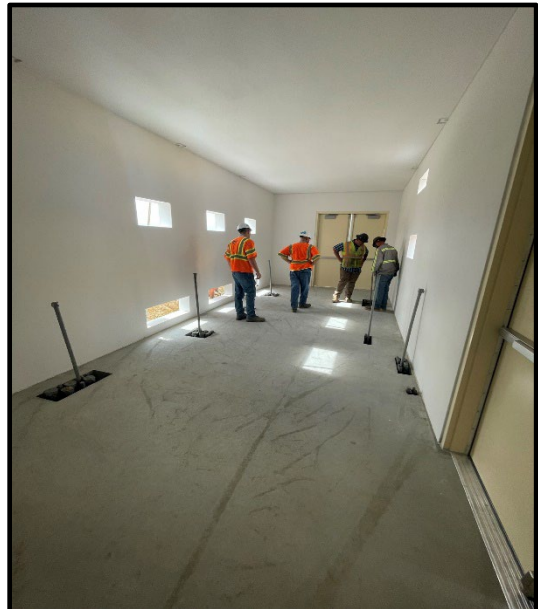


Photo 60: Inside Pump House.



Photo 61: Discharge into Pond 2 with rip/rap.



Photo 62: VFD's arrive.



Photo 63: Pump discharge construction.



Photo 64: Pump discharge tie-in to 36" main line.



Photo 65: Pump discharge construction complete.



Photo 66: Pump site gravel installation.



3.3 Groundwater Extraction Wells

The District currently owns and operates twenty (20) groundwater extraction wells located throughout the service area. Most of these extraction wells were built between 2009 and 2010. These wells have been and are being serviced monthly to maintain their performance. Table 6 below, lists all the wells owned and operated by the District and the dates in which they were constructed and/or rehabilitated.

Table 6: Well Construction and Rehabilitation

Well Name	Location	Canal to Receive Recovered Water	Year Constructed or Rehabilitated	Capacity (cfs)
KD-01	N/o Fairview Rd & South "H" Street	Kern Island Main Canal	2012	4.7
KD-02	SW/o E Panama Ln & Cottonwood Rd	Central Branch Canal	2012/2014	3.6
KB-01	NW Corner of Kern Island Basins	Kern Island Main Canal	2010	8.82
KB-03	NE Corner of Kern Island Basins	Kern Island Main Canal	2010	9.11/4 ⁶
KB-04	Westside of Kern Island Basins	Kern Island Main Canal	2010	8.84
KB-06	Eastside of Kern Island Basins	Kern Island Main Canal	2010	9.10
KI-07	S/o Berkshire Rd and South "H" St	Kern Island Main Canal	2010	9.80
KI-08	N/o Hosking Ave & South "H" St	Kern Island Main Canal	2010	9.64
AE-01	SW/o District Blvd & Ashe Rd	Stine Canal & Kern Island Main Canal	2010	10.16
AE-02	S/o Panama Ln & Akers Rd	Kern Island Main Canal	2010	9.82
AE-03	S/o Panama Ln & Wible Rd	Branch One Canal and Kern Island Main Canal	2010	10.13
AE-04	S/o Panama Ln & South "H" Street	Kern Island Main Canal	2010	10.02
FR-01	NW Corner of Stonefield Basins	Smith Judd Canal	TBD	TBD
FR-02	SW/o Taft Hwy and Stine Rd	Farmers Canal	2013	5.62
FR-03	SW/o Panama Ln & Stine Rd	Farmers Canal	2012	6.51
BV-02	NE corner of Buena Vista Basin Pond 5	Buena Vista Canal	2010	9.62
BV-03	NW Corner of Buena Vista Basin Pond 5	Buena Vista Canal	2010	9.44
BV-04	NE Corner of Buena Vista Basin Pond 6	Buena Vista Canal	2010	9.69
BV-05	NE Corner of Buena Vista Basin Pond 7	Buena Vista Canal	2010	9.73
ST-01	Old River Basins	Stine Canal	TBD	2.00
			Total	156.35

⁶ This well motor was converted to a variable frequency drive and currently operates at 4 cfs



4.0 FUTURE CAPITAL IMPROVEMENT PROJECTS

In addition to several ongoing projects, the District attempts to identify future Capital Improvement Projects that will enhance operations to allow for improved ability to store water, reclaim banked water, and transport water to any of the facilities within the District and to the District's partners. Several canals will require reconstruction efforts, banking facilities will be constructed, existing basins will be maintained, and additional groundwater recovery wells will need to be constructed. The following is a brief summary of CIP's the District is considering taking on in the near future and is not meant to be an all-inclusive list.

4.1 Conveyance Facilities

The District's conveyance facilities have been improved significantly since the initiation of the District's Water Banking Projects. Operation of the District canals is more efficient, and flows are more accurately controlled and measured. The following are additional facilities or improvements that the District is considering.

4.1.1 Eastside Canal

As part of the Sunset Basins Project, a hydraulic model was performed on the canal from Muller Road to the end of the canal. The District plans on continuing the hydraulic model of the Eastside Canal from the head of the canal to Muller in order to identify key areas of improvement.

4.1.2 Stine Canal North of California Avenue

The head of the Stine Canal comes off the Carrier Canal, south of Truxtun Avenue and west of Highway 99. From an open channel, it then transitions into an 84-inch diameter pipeline as it goes underneath the railroad, then transitions into an open ditch for approximately 295-feet, then transitions into two 60-inch diameter pipes as it goes underneath California Avenue. The District tries to avoid transitions from pipeline to open channel, back to pipeline in relatively short stretches, as it tends to increase losses within the canal. Other issues that arise from leaving this portion of the canal as an open ditch are the homeless encampments that occur in the canal pipeline and the buildup of trash. Exhibit 12 shows the pipeline alignment as well as proposes continuing the 84-inch line into a transition structure and exits into two 60-inch pipelines.

4.1.3 Kern Island Canal

The Kern Island Canal received much rehabilitation over the past several years; however, there are still locations that need improvements for the canal to be operated as planned for water banking and irrigation demands.

Among the improvements to be completed is the reconfiguration of the diversion from the Kern Island Main Canal into the Kern Island Central Branch Canal. Presently, this diversion point does



not have adequate control to regulate flows into either canal. The District plans to remove the existing weir in the Kern Island Main Canal and replace it with structures that will regulate flows into either canal. These structures will also be constructed to provide adequate relief during time of high flows or other operational concerns. A preliminary conceptual design is shown in Exhibit 14.

4.1.4 Rim Ditch Proposed Regulating Reservoir

Two locations are shown in Exhibit 15 for a proposed regulating reservoir along the Rm Ditch. Site one is located immediately east of Highway 99 and is approximately 21 acres while site two is located further east of Highway 99 and is approximately 30 acres. The regulating reservoir is meant to provide relief during periods of high flows, whether due to emergency shutoffs by the District's farmers or increased flow due to storm water inflows.

4.2 Groundwater Extraction Wells

To support the District's water banking program, the District anticipates drilling between on or two additional groundwater recovery wells. Staff is evaluating the potential of a new well in the Old River Basins. It is possible that the well at the Stonefield Basins (FR-01) can be rehabilitated to recover water banked in those basins; however, from initial inspection, this well may need to be abandoned, replaced, or converted to a monitoring well.

4.2.1 Monitoring Wells in Compliance with SGMA

The District joined with the City of Bakersfield, Improvement District 4 of the Kern County Water Agency, and other local agencies to form the KRGSA. The KRGSA completed a final draft of their GSP in December 2019 and submitted it to the state of California in January 2020. The GSP requires the District to monitor the groundwater levels in several groundwater extraction wells on a semi-annual basis. Prior to SGMA, the District tracked the depth to water level in several wells as part of other programs: California Statewide Groundwater Elevation Monitoring (CASGEM), maintenance on District owned wells, State Water Project assessments, and data to KCWA. Further details may be found in the KRGSA's GSP.

4.3 Groundwater Recharge Facilities

4.3.1 New Groundwater Recharge Properties

The District currently owns and operates eleven groundwater recharges sites, totaling 1,122 gross acres, which are used in wet years to recharge the underground aquifer. This total includes the 75 acres of land attributed to the District for the Sunset Basins, the 19 acres to the north of the Kern



Island Basins, the 9-acres to the east of the Branch One Basin's Pond 2, and the 144-acres of the newly acquired Old River Basins on the northeast corner of Old River Road and Taft Highway.

The potential of SGMA regulations possibly restricting groundwater pumping is motivation to enhance recharge capabilities. In 2017, the District banked approximately 60,000 acre-feet through direct recharge in its recharge basins. This amount does not include operational recharge in canals, grower recharge, or in-lieu deliveries. Since 2017, the District has purchased additional recharge ground and it is estimated that an additional 94 acres would be needed to achieve the District's goal of banking approximately 90,000 acre-feet per year when high flow water is available.

4.3.2 Recharge Measurement

The District measures recharge amounts using two basic methods: 1) by measurement of water into the basins through waterman gates and subtracting the outflow from the lower basins, and/or 2) collecting canal flow rates at the closest weirs upstream and downstream of the basins with the difference of flow being what was recharged. While this is accurate in determining the overall effectiveness of all ponds at a given site, it does not show the effectiveness of individual ponds.

In the future, staff gauges need to be installed in the individual ponds to accurately track performance of each pond. In the beginning of 2017, the high flow river water was turbid and most of the canals were running for the first time in a long while, meaning a lot of dirt was suspended in the water. As fine-grained particles enter the basins, it is important to track performance of individual ponds in order to determine when remedial options are considered. Infiltration rates need to be determined during each recharge period and compared to the previous recharge period to track trends. It is normal for spreading ponds to silt up over time, but without collecting the data, it is difficult to evaluate the effectiveness of groundwater recharge.



5.0 MAINTENANCE ACTIVITIES

Maintenance activities are performed on a regular basis throughout the year on all canals, canal crossings, turnouts, District owned wells and recharge basins. These activities are presented below. The following sections are routine maintenance activities performed by the District.

5.1 Maintenance Activities – 2023

The maintenance staff's operation in the 2023 calendar year continued to incorporate two different areas of maintenance summarized below: normal District maintenance, and water banking maintenance.

5.1.1 Kern Delta Water District Maintenance

The following activities were performed by Kern Delta Water District's maintenance staff during 2023 for regular District operations.

- Repairs were made to numerous turnouts/gates, which are summarized in the attached monthly maintenance reports: Over the course of the year, these gates encountered operational problems, including minor leaking, rusted components, sediment buildup, and other problems ranging from slight inconvenience in operating to major problems that limited or even prevented the use of the gates (i.e., slide gate was broken, gate had been buried by sediment, etc.).
- Motor grader sloped and graded all canals within the District throughout the year.
- Tumbleweeds were removed from District canals and property, stacked, and burned.
- Grade boards were replaced on the canals as needed.
- Removed Buena Vista Boulevard crossing.
- Replaced Buena Vista Canal crossing north of the Buena Vista Basins.
- Various areas of tree trimming/removal
- Bulk trash pickup and disposal from all canals.

Meters: The District has increased the usage of flow meters at both diversion points and at major canal locations. Meter repairs are summarized in the monthly reports.

District Wells: All District wells were serviced monthly. See attached monthly reports for more information.



Appendix A

Maintenance Report

January 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Replaced turn out structure and pipe on Eastside Canal south of Bear Mountain Blvd. (#298)
 - b. Fixed concrete panels on 15 Ditch between I-5 and Herring Rd.
 - c. Replaced weir boards on Sunset Basins gravity-diversion structure.
 - d. Installed Staff gauges on the 20-foot Ditch at Wible and on the Rim Ditch at 551.
 - e. Repaired meters at 631A and 551.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Modifications to turn table pump.
 - c. Repaired tires on trucks 325, 222, 224 and trailer T-13.
 - d. Repair hydraulic hose on motor grader #403.
 - e. Repair backhoe #402 ride control.
3. **District Wells.**
 - a. Monthly service and inspection of all District Wells to check dripper operation and clean well pads.
 - b. Pulled motor on KB-4 and taken to shop for inspection for failure.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Sloping banks on Eastside Canal.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Assist with turnout replacement (#298) on eastside Canal south of Bear Mtn Blvd
 - b. Repaired wash-in on the east bank of the Eastside Canal north of Panama Ln.
 - c. Removed tumbleweeds from Stine Canal in preparation for startup.
 - d. Repaired wash ins on Kern Island.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Tumbleweed removal on Central, Kern Island, Farmers, Smith & Judd and Stine.
 - b. Assist on 15 Ditch panel repair and removing leaves.
 - c. Cleanup of Eastside Canal in preparation for startup.
7. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Apply preemergent to banks and fence lines at the Kern Island, Branch 1, Stonefield, DiGiorgio, and Romero basins.
8. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
 - a. No treatments needed this month.
9. **Rodent Control**
 - a. Bait stations were checked and filled throughout the district this month.

10. Trash Removal.

- a. Clean trash racks throughout District.
- b. Remove tumbleweeds throughout District.
- c. Removed leaves from the 15 Ditch.

11. Fence Repairs. Fences and Gates were repaired at the following locations;

- a. Kern Island Canal at Columbus, 34th and 30th Streets
- b. Central Canal at Planz, Wilson and Union Ave.
- c. Stine Canal at Park Circle.
- d. Eastside Canal at Williams St.

12. Safety Meetings. Weekly tailgate safety topics were;

- a. Why Safety is Important.
- b. PG&E 811 Dig Class

13. Water Banking Activities. The following jobs were completed during the month;

- a. Remove tumbleweeds along banks and fence lines of basin properties in preparation for pre-emergent application.
- b. Apply preemergent to banks and fence lines at the Kern Island, Branch 1, Stonefield, DiGiorgio, and Romero basins.

14. Future Projects. The following projects will be completed as time permits:

- a. Trim and remove trees/brush as needed along canals for grader passage.

15. Future Water Banking Projects.

- a. Install permanent staff gauges at basin properties.

Maintenance Report

February 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Install screens and catwalks on new Eastside turnouts #298 and Rim Ditch.
 - b. Installed Staff gauges on the Eastside Canal at Bear Mtn.
 - c. Built and installed a new screen on 15-Ditch at gate #146.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Modifications to turn table pump.
 - c. Changed emissions code sensor and changed motor and transmission oil on Motor-grader #403.
 - d. Repaired tire on truck #326.
 - e. Added backup lighting on Volvo dump truck #330.
 - f. Repaired rear end and transmission on truck #214.
3. **District Wells.**
 - a. New motor installed on well #KB-4.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Finished sloping banks on Eastside Canal and sloped the BV Canal from Mtn Vista to the head.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Dig up rodent holes on Stine from the Bladder Basin to end.
 - b. Repair bypass on Eastside Canal at Sunset Basins.
 - c. Clean leaves out of 15-Ditch.
 - d. Repair wash ins on BV Canal at the basins.
 - e. Dip Eastside canal due to trash.
 - f. Haul dirt and repair breach on Eastside canal north of DiGiorgio Rd.
 - g. Remove tumbleweeds from canals.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Fix bank on Rim ditch from breach also dug up rodent holes that were leaking.
 - b. Remove tumbleweeds from canals.
 - c. Dig up rodent holes on Kern Island north of Bear Mtn on both banks.
 - d. Pick up piles of tumbleweeds on canals.
7. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Apply preemergent to Eastside Canal, sides and bottom from DiGiorgio Rd to end and also on the canal sides along Lake St (bottom had water present).
 - b. Sprayed the Stine from bottom working north inside and outside banks.
8. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
 - a. No treatments needed this month.

9. Rodent Control

- a. Bait stations were checked and filled throughout the district this month.
- b. Placed two new bait stations on Eastside Canal north of DiGiorgio Rd where breach occurred.

10. Trash Removal.

- a. Clean trash racks throughout District.
- b. Remove tumbleweeds throughout District blown in from storms.

11. Fence Repairs. Fences and Gates were repaired at the following locations;

- a. Kern Island Canal at Golden State Ave. (air vent cage), Columbus, 30th, and Pacheco Rd.
- b. Central Canal at Union Ave., Planz Rd., Belle Terrace, Terrace Way, South Gate and Ming Ave.

12. Safety Meetings. Weekly tailgate safety topics were;

- a. Proper Tire Wear.
- b. How To Be A Better Driver.
- c. The Importance of Standard Operating Procedures.

13. Water Banking Activities. The following jobs were completed during the month;

- a. Remove tumbleweeds along banks and fence lines of basin properties in preparation for pre-emergent application.
- b. Apply preemergent to banks and fence lines at the Stonefield and Buena Vista and Stine basins.

14. Future Projects. The following projects will be completed as time permits:

- a. Trim and remove trees/brush as needed along canals for grader passage.
- b. Oversee subcontractor in replacement of 13-Ditch Return Structure and pipeline.
- c. Replace BV Canal crossing at the BV Basins
- d. Coordinate Buena Vista Blvd crossing repair with KC Roads Department

15. Future Water Banking Projects.

- a. Install permanent staff gauges at basin properties.
- b. Inspect structures at basin properties in preparation for a water banking year.

Maintenance Report

March 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Coordinate construction of 13-Ditch Return structure and pipeline
 - b. Installed plates, screens, overpour and catwalk on new 13 Ditch Return structure.
 - c. Coordinate Buena Vista Blvd crossing removal with KC Roads Department
 - d. Removed Buena Vista Blvd crossing (pavement, dirt and rusted corrugated metal pipe) at the Eastside Canal. Made an open canal between the headwalls.
 - e. Assisted Arvin Edison staff in the removal of the Sunset bypass.
 - f. Installed (3) 48-inch-diameter by 40-foot-long HDPE pipes for a crossing on the BV Canal at north end of BV basins.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Changed water pump and starter on backhoe 402.
 - c. Replaced hydraulic hoses on grader 403.
 - d. Install new ice machine in shop.
 - e. Repair dipping bucket for backhoe 404.
3. **District Wells.**
 - a. Monthly service and inspection of all District Wells, clean well pads as needed.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Sloped the Central Canal from the Lake to the Rim Ditch.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Haul dirt to Buena Vista Canal in preparation for crossing replacement.
 - b. Install crossing in Buena Vista Canal.
 - c. Fix an outlet on BV basins with dirt and rip-rap.
 - d. Removed tumbleweeds from Smith Judd.
 - e. Fixed wash ins and dig out rodent holes on BV and Randall.
 - f. Removed 13 Ditch return structure and assessed damaged to rusted out corrugated pipe.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Removed tumbleweeds and trash from East Branch, Stine, Central and Branch 1.
 - b. Removed asphalt dirt and old pipe on Buena Vista Blvd at the Eastside Canal and installed rip-rap on sides and bottom. Made an open canal section between headwalls.
 - c. Removed abandoned irrigation pipelines at Old River Basins.
7. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Sprayed Famers, Randall, Burness, Branch 1 inside banks and right of way.
8. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;

- a. No treatments needed this month.

9. Rodent Control

- a. Bait stations were checked and filled throughout the district this month and moved the nonactive stations to areas with activity.

10. Trash Removal.

- a. Clean trash racks throughout District.
- b. Remove tumbleweeds throughout District blown in from storms.

11. Fence Repairs. Fences and Gates were repaired at the following locations;

- a. Kern Island Canal - 4th and P,
- b. Central Canal- Replaced gate at White Ln.
- c. Eastside Canal- Kentucky Street.
- d. Farmers Canal - Seasons Dr.

12. Safety Meetings. Weekly tailgate safety topics were;

- a. The Importance of Knowing/Understanding Company Policies and Procedures.
- b. Keys to Preventing Hand Injuries.
- c. Upcoming Projects/Safety Overview.
- d. Dump Truck Overturns.
- e. Report All Accidents, Incidents & Near Misses.

13. Water Banking Activities. The following jobs were completed during the month;

- a. Remove tumbleweeds along banks and fence lines of basin properties in preparation for pre-emergent application.
- b. Finished preemergent application at the Stine basins.
- c. Fixed BV basin outlet

14. Future Projects. The following projects will be completed as time permits:

- a. Trim and remove trees/brush as needed along canals for grader passage.
- b. Install fire lockers and drip pans in the shop.
- c. Monitor sinkholes on the sides of Shafter Road (Smith Judd Canal) and Gosford Road (Farmers Canal) and coordinate with KC Roads Department
- d. Replace BV East Canal crossing at the Maple Canal.

15. Future Water Banking Projects.

- a. Skim sediment off pond bottoms to improve recharge.
- b. Repair erosion around basin structures
- c. Dredge and repair canals following big water year.

Maintenance Report

April 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Make access lid to remove trash and debris from under DiGiorgio backup on the catwalks, also welded chains to gate to prevent them from falling down into gate flapper.
 - b. Adjust the over pour height for 13 return box.
 - c. Made and installed 2 catwalks on Randel, on backup structures that were unsafe for employees to access.
 - d. Weld new stem on gate on turnout 3-2-190 on the Central.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Prep new backhoe # 408.
 - c. Replace brakes on trash truck # 323.
 - d. Installed new cutting edge on grader # 403 moe board.
 - e. Installed new cabinets and anti-spill for oil in shop.
3. **District Wells.**
 - a. Monthly service and inspection of all District Wells, clean well pads as needed.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Sloped the Central Canal from Lake to the head also got the East Branch. Started sloping Stine at the end working north.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Build and remove dam on Branch 1 for repair on lined section below Taft Hwy.
 - b. Fix wash ins on the BV canal from Taft Hwy south.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Helped in removing and cutting trees on Kern Island between Planz and Wilson.
 - b. Cleaned East Branch.
 - c. Cleaned up homeless encampments.
7. **Backhoe # 408** The following jobs were completed this month;
 - a. Fix wash ins on Kern Island between Columbus and 34th St.
 - b. Clean the 15 Ditch lined section along Old River.
 - c. Haul dirt to head of BV north of Howell Dr where water is eroding the banks.
8. **Weed Spraying.** The following canals were sprayed during the month;
 - a. The Central was spot treated for weeds followed up behind the grader getting around turnouts and headwalls.
 - b. The Kern Island was treated including Branch 1, 18 North and South, and 13 Ditch.
 - c. Started on Eastside canal from head and working south.
9. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;

- a. Treatments were done on the Central and Kern Island canals.

10. Rodent Control

- a. Bait stations were checked and filled throughout the district this month and moved the nonactive stations to areas with activity.

11. Trash Removal.

- a. Clean trash racks throughout District.
- b. Removed trash left behind from homeless encampments.

12. Fence Repairs. Fences and Gates were repaired at the following locations;

- a. Kern Island Canal - 34th, 30th, Wilson and Pacheco.
- b. Central Canal- Terrace Way and Union.
- c. Eastside Canal- Sterling, Fairfax and Edison.
- d. Stine Canal – Grissom and Park Circle.
- e. BV- Gate fell off hinges on Ridge Oak.

13. Safety Meetings. Weekly tailgate safety topics were;

- a. Storing, Inspecting, Maintaining, and Using Portable Ladders.
- b. What Is Your SDS Telling You About The Products You're Using.
- c. Don't Put Your Life On The Line.
- d. Don't Let The Warm Weather Leave You Bitten.

14. Water Banking Activities. The following jobs were completed during the month;

- a. Mowed 1 cell of the 20 ac along Ash (Romero Basins).
- b. Haul rip-rap to Old River basins and install on canal bank to prevent erosion from bypass.

15. Future Projects. The following projects will be completed as time permits:

- a. Trim and remove trees/brush as needed along canals for grader passage.
- b. Install fire lockers and drip pans in the shop.
- c. Monitor sinkholes on the sides of Shafter Road (Smith Judd Canal) and Gosford Road (Farmers Canal) and coordinate with KC Roads Department
- d. Replace BV East Canal crossing at the Maple Canal.
- e. Replace or remove crossing on the Stine 5-0-546 backup structure/crossing no longer needed and is failing.

15. Future Water Banking Projects.

- a. Skim sediment off pond bottoms to improve recharge.
- b. Repair erosion around basin structures
- c. Dredge and repair canals following big water year.

Maintenance Report

May 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Built a catwalk for structure 5-0-543 on the Stine canal.
 - b. Fabricated safety rails on both sides Sunset gravity basin structure
 - c. Installed safety chain on the Kern Island screen at 30th St.
 - d. Installed 30 feet of 36" HDPE pipe on Kern Island 20' on turnout 3-0-119 due to pipe failure.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Replace radiator on truck #326.
 - c. Replace hydraulic steel line on grader #403 due to a hole.
 - d. Put new taillights on #105 due to an internal fault in housing.
 - e. Fix an air leak on truck #330.
3. **District Wells.**
 - a. Monthly service and inspection of all District Wells, clean well pads as needed.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Finished grading on Stine canal.
 - b. Graded the Farmers canal.
 - c. Started the Kern Island at 20' working north.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Fix gopher hole leak on Central.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Dig up gopher holes on Rim.
 - b. Stop breach on 20' 3-0-119.
 - c. Dip for debris on the Central at hot spots.
7. **Backhoe # 408** The following jobs were completed this month;
 - a. Assisted with pipe installation 3-0-119.
 - b. Repair rim ditch due to breach.
 - c. Haul dirt to breaches.
 - d. Dig out the area between railroad crossing and Branch 1 backup weir.
8. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Started spraying BV from bottom headed north.
 - b. Sprayed Eastside canal.
 - c. Sprayed Rim ditch and part of the Drain from Hwy. 99 to Rim.
9. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
 - a. Drip treatments were done on the following canal systems Kern Island, Central, Farmers, and BV.

- b. Surface sprayed the following areas for algae 18 N&S, Randal, and 13 Ditch.

10. Rodent Control

- a. Bait stations were checked and filled throughout the district this month and moved the nonactive stations to areas with activity.

11. Trash Removal.

- a. Clean trash racks throughout District.
- b. Removed trash left behind from homeless encampments.

12. Fence Repairs. Fences and Gates were repaired at the following locations;

- a. Fix gate at DiGiorgio Basins.
- b. Stine Canal- Apple Blossom.
- c. Central Canal- at Planz Rd.
- d. Eastside Canal – at Sterling.
- e. Kern Island Canal – at 30th Street

13. Safety Meetings. Weekly tailgate safety topics were;

- a. Overview meeting of what's expected.
- b. Why take shortcuts?
- c. Stay cool and hydrated.
- d. Take precautions while working outdoors, don't be a victim of heat illness.
- e. District quarterly safety meeting, Fire Extinguisher Use Demonstration.

14. Water Banking Activities. The following jobs were completed during the month;

- a. Mowed Branch 1 Basins.
- b. Spot treat basins for weed control.

15. Future Projects. The following projects will be completed as time permits:

- a. Trim and remove trees/brush as needed along canals for grader passage.
- b. Monitor sinkholes on the sides of Shafter Road (Smith Judd Canal) and Gosford Road (Farmers Canal).
- c. Replace BV East Canal crossing at the Maple Canal.
- d. Replace or remove crossing on the Stine 5-0-546 backup structure/crossing no longer needed and is failing.

16. Future Water Banking Projects.

- a. Skim sediment off pond bottoms to improve recharge.
- b. Repair erosion around basin structures.
- c. Dredge and repair canals following big water years.

17. Newly Discovered Issues.

- a. Head of BV is sanding up, currently have long reach pulling out sand.
- b. Flow restriction from the inlet of Drain into Rim Ditch and weir #551.
- c. High water level on Kern Island near Southgate.

Maintenance Report

June 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Built a catwalk for structure 4-0-236 on Farmers Canal and back up structure on Smith Judd extension.
 - b. Worked on gates 18 and 21 on Rim got the to open after years of sitting idle.
 - c. Modified screen on Central added deflector plates to keep trash from falling on catwalk and staying on conveyer.
 - d. Clean water pump screens on Central screen, 3 times this month.
 - e. Fix turn out gate 20 on BV east.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Installed new license plate on T-12.
 - c. Replace hood on backhoe # 404 do to latch housing being broke.
 - d. Fill front tires on backhoe # 408 with water to add weight.
 - e. Truck # 226 replaced window.
 - f. Replaced tires on backhoe # 404.
3. **District Wells.**
 - a. Monthly service and inspection of all District Wells, clean well pads as needed.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Kern Island was done from 20' to Shafter.
 - b. Sloped all of Branch 1.
 - c. Kern Island was done from Branch 1 to Taft HWY.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Fix breaches on Rim.
 - b. Stop leaking gopher hole on Bladder (Stine).
 - c. Fix wash inn on Central (Wayside Park).
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Fix and haul dirt Eastside breach.
 - b. Assisted in removing trees Central and Branch 1.
 - c. Dig up leaks on Rim.
 - d. Remove dirt along edge on Kern Island north of Branch 1 weir along S. H St.
7. **Backhoe # 408** The following jobs were completed this month;
 - a. Installed rip-rap at the head of the BV.
 - b. Haul dirt to BV West to raise bank and dig up rodent holes.
 - c. Remove dirt pushing up against fence on Branch 1 south of Harris rd.
 - d. Dipped Hamilton.
 - e. Remove dirt build up on Kern Island on west bank north of 631A.
8. **Weed Spraying.** The following canals were sprayed during the month;

- a. Finish up Eastside.
 - b. Sprayed Farmer canal.
 - c. Started Stine canal at end working north, hand sprayed the city yard.
9. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
- a. Drip treatments were done on the following canals Central, Eastside, Kern Island.
 - b. Surface sprayed the following areas for algae 18 N&S, Randal, Section 5 and 13 Ditch.
10. **Rodent Control**
- a. Bait stations were checked and filled throughout the district this month and moved the nonactive stations to areas with activity.
11. **Trash Removal.**
- a. Clean trash racks throughout District.
 - b. Removed trash left behind from homeless encampments.
12. **Fence Repairs.** Fences and Gates were repaired at the following locations;
- a. Stine Canal- Head screen gate and District.
 - b. Central Canal- Union, Ming and Southgate.
 - c. Eastside Canal – Owens
 - d. Kern Island Canal – 30th, 34th,
 - e. Branch 1- Smoke Tree trailer park and Harris.
 - f. BV- Fix slide gate off Old River.
 - g. Farmers- Pacheco and Seasons Dr.
13. **Safety Meetings.** Weekly tailgate safety topics were;
- a. Hand Safety and Injury Prevention.
 - b. Know Your Surroundings.
 - c. What are Slips, Trips and Fall Hazards in the Workplace.
 - d. What Does Water Do For You.
 - e. House Keeping in the Workplace.
14. **Water Banking Activities.** The following jobs were completed during the month;
- a. Mowed north basin along Ash.
 - b. Spot treat basins for weed control.
15. **Future Projects.** The following projects will be completed as time permits:
- a. Trim and remove trees/brush as needed along canals for grader passage.
 - b. Monitor sinkholes on the sides of Shafter Road (Smith Judd Canal) and Gosford Road (Farmers Canal).
 - c. Replace BV East Canal crossing at the Maple Canal.
 - d. Replace or remove crossing on the Stine 5-0-546 backup structure/crossing no longer needed and is failing.
16. **Future Water Banking Projects.**
- a. Skim sediment off pond bottoms to improve recharge.

- b. Repair erosion around basin structures.
- c. Dredge and repair canals following big water years.

17. Newly Discovered Issues.

- a. Head of BV is sanding up, currently have long reach pulling out sand.
- b. Flow restriction from the inlet of Drain into Rim Ditch and weir #551.
- c. High water level on Kern Island near Southgate.

Maintenance Report

July 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Fabricated and installed another catwalk for a backup structure on the bottom reach of the reach on Stine Canal (5-0-543) because previously installed catwalk was stolen.
 - b. Replaced staff gauges at the following weirs; 551, 631, Belle Terrace on the KI and Belle Terrace on the Central.
 - c. Clean water pump screens on the traveling water screens 3 times this month.
 - d. Rancho Tree Service removed several trees on Central Canal south of Southgate.
 - e. Fix wash in below 631A on the Kern Island.
 - f. Fix wash ins on the Central between Buena Vista Blvd. and Bear Mtn.
 - g. Removed trees on Farmers Canal between Seasons Dr. and Harris Rd.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Installed new wood decking and reinforced where needed on Trailer T-11.
 - c. GPS installed on most of the fleet.
 - d. Tire repairs on 222, 216, 218 and 223.
 - e. Replace fuel pump and filter on 325.
 - f. Weld in new bushings in the muck bucket.
3. **District Wells.**
 - a. Monthly service and inspection of all District Wells, clean well pads as needed.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Kern Island from Shafter Road to the head including the 13 and 18 Ditches.
 - b. Stine Canal from Chester Ln. working south.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Dug up and collapsed gopher holes on Rim Ditch and KI Drain.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Remove plywood from the Eastside Canal at the railroad weir.
 - b. Helped with multiple homeless encampments.
 - c. Dipped the Eastside, BV, and Central Canals.
 - d. Dug up and collapsed gopher holes on Kern Island north of Bear Mtn.
7. **Backhoe # 408** The following jobs were completed this month;
 - a. Fixed wash in below 631A.
 - b. Dug up and collapsed gopher holes on the Eastside between Edison Rd. and Bear Mtn.
 - c. Remove more trees from Central Canal Lake to make it more accessible to treat.
 - d. Remove tumbleweeds from Stine Canal from McCutchen Rd to railroad tracks.
 - e. Haul dirt to Stine Canal to repair bank erosion from high flows.

8. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Finished the Stine canal.
 - b. BV canal.
 - c. 15 Ditch and the 20-foot Ditch.
 - d. Smith Judd extension from Bear Mtn. to the 20-foot.
 - e. Treat tree stumps recently cut by Rancho Tree Service on the Central south of Southgate.
9. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
 - a. Drip treatments were done the Buena Vista (2 locations), Eastside, Stine, and Farmers.
 - b. Surface sprayed algae mats on the 18 N&S, Randall, Section 5, and 13 Ditches.
10. **Rodent Control**
 - a. Bait stations were checked and filled throughout the district this month and moved the nonactive stations to areas with activity.
11. **Trash Removal.**
 - a. Clean trash racks throughout District.
 - b. Removed trash left behind from homeless encampments.
12. **Fence Repairs.** Fences and Gates were repaired at the following locations;
 - a. Stine Canal- Rehung gate at Flicker St, extended gate at Park Circle, patched holes at District Blvd and White Ln.
 - b. Central Canal- Wilson, Planz, Union, Ming and Southgate.
 - c. Eastside Canal
 - d. Kern Island Canal – S. H St. and Pacheco.
 - e. Branch 1- Smoke Tree.
 - f. BV Canal
 - g. Farmers- Seasons Dr.
13. **Safety Meetings.** Weekly tailgate safety topics were;
 - a. Heat Illness Prevention.
 - b. How to Avoid Fatigue When Working Outdoors.
 - c. Are You At Risk For Complacency.
 - d. Working Safely Safety Tips.
14. **Water Banking Activities.** The following jobs were completed during the month;
 - a. Mowed Branch 1 Basins.
 - b. Spot treat basins for weed control.
15. **Future Projects.** The following projects will be completed as time permits:
 - a. Trim and remove trees and brush as needed along canals for grader passage.
 - b. Monitor sinkholes at Shafter Road (Smith Judd Canal) and Gosford Road (Farmers Canal).

- c. Replace BV East Canal crossing at the Maple Canal.
- d. Replace or remove crossing on the Stine 5-0-546 backup structure/crossing which is no longer needed and is failing.
- e. Replace or remove crossing on the KI Drain.

16. Future Water Banking Projects.

- a. Skim sediment off pond bottoms to improve recharge.
- b. Repair erosion around basin structures.
- c. Dredge and repair canals following a big water year.

17. Newly Discovered Issues.

- a. Head of BV is still taking on sand from the River Canal. Sand removal with long reach excavator and off-site hauling is ongoing.

Maintenance Report

August 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Cleaned water pump screens on the traveling screens 3 times this month.
 - b. Rancho Tree Service removed several trees from Eastside Canal by Rock Dam.
 - c. Removed trees on East Branch Canal from Madison St. to E. Casa Loma Dr.
 - d. Repaired breaks on KI at the Met Backup and Rim ditch.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Repaired fuel evaporator canister on truck 216.
 - c. Fixed headlight on Truck #330.
 - d. Truck #323 went to Jim Burk Ford due to no power to instrument panel.
 - e. Replaced sensor on Truck #106.
 - f. Replaced air fittings on Truck #324 to stop air leaks.
3. **District Wells.**
 - a. Monthly service and inspection of all District Wells, clean well pads as needed.
 - b. Replaced some oil level sight lenses.
 - c. BV-2, BV-4, KB-1, and KB-4 were ran for a few hours so that the Irrigated Lands Regulatory Program could collect water samples on August 30th.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Finished Stine Canal and the 15 Ditch to the 23 Ditch.
 - b. Farmers Canal from Pacheco to Old River.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Dig up rodent holes on BV.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Remove tumbleweeds on Eastside Canal along fence lines from DiGiorgio Rd. to Panama Rd.
 - b. Dip Eastside Canal in various backups and road crossings.
 - c. Haul dirt to the Met Backup and Rim Ditch for bank rebuild following breaks.
 - d. Assisted in tree removal on Branch 1.
7. **Backhoe # 408** The following jobs were completed this month;
 - a. Repair breaks twice this month on the KI at the Met backup.
 - b. Repair breaks on Rim Dirch.
 - c. Dig up rodent holes on Rim to prevent leaks.
 - d. Dipped the BV for debris removal.
 - e. Cleaned up tumbleweeds at Kern Island and Romero Basins.

8. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Central from head to the Rim Ditch.
 - b. Famers Canal.
 - c. Eastside Canal.
 - d. Spot treated BV in town.
9. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
 - a. Drip treatments were done on Buena Vista at Ming, Eastside at Mt View and Hwy. 178 vault, Stine at the head (city corp. yard), and the Kern Island at 30th.
10. **Rodent Control**
 - a. Bait stations were checked and filled throughout the district this month and moved the nonactive stations to areas with activity.
11. **Trash Removal.**
 - a. Clean trash racks throughout District.
 - b. Removed trash left behind from homeless encampments.
12. **Fence Repairs.** Fences and Gates were repaired at the following locations;
 - a. Stine Canal- at Garnsey Lane and Stine Rd.
 - b. Central Canal- at Wilson Rd., Planz Rd., Union Ave., Ming Ave. and Southgate.
 - c. Eastside Canal- at Oswell and 30th St.
 - d. Kern Island Canal – Calcutta, Columbus, and 34th St.
 - e. Branch 1- Harris Rd.
 - f. BV Canal
 - g. Farmers Canal
13. **Safety Meetings.** Weekly tailgate safety topics were;
 - a. Don't Take Chances.
 - b. Maintaining A Clean and Orderly Workplace.
 - c. Slow Down- Back to School Means Sharing the Road.
 - d. Employee Safety Responsibilities.
14. **Water Banking Activities.** The following jobs were completed during the month;
 - a. Mowed cells that were dry enough as needed at Romero and Buena Vista basins.
 - b. Spot treat basins for weed control.
 - c. Removed tumbleweeds on feeder ditch and fence line at Kern Island Basins.
 - d. Removed tumbleweeds on fence lines next to houses at Romero Basins.
15. **Future Projects.** The following projects will be completed as time permits:
 - a. Monitor sinkholes at Shafter Road (Smith Judd Canal) and Gosford Road (Farmers Canal) and coordinate repairs with County.
 - b. Coordinate replacement of Eastside Canal crossing at Buena Vista Blvd. with County.
 - c. Replace BV East Canal crossing at the Maple Canal (by others).
 - d. Replace crossing on the KI Drain (by others).

- e. Dredge the Kern Island Drain and Rim Ditch with 3 long reach excavators from Union Ave to Weir #551 (by others).
- f. Dredge the KI at Weir #631A and head of the Drain with long reach excavator (by others).
- g. Dredge the Kern Island at the split to the Central Canal with long reach excavator (by District staff)
- h. Evaluate other shut down projects to be done by District staff (e.g. new turnouts and repairs)

16. Future Water Banking Projects.

- a. Skim sediment off pond bottoms to improve recharge.
- b. Repair erosion around basin structures.
- c. Install staff gauges.

17. Newly Discovered Issues.

- a. Complete sand removal project at the head of the BV Canal.

Maintenance Report

September 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Cleaned water pump screens on the traveling screens, IWS installed new water pump and motor. Installed new controller and surge protector in control panel.
 - b. Removed trees on Central from Union to White Ln, on the Kern Island from La France to Ming and 10th to Brundage and started the BV at Ming working south.
 - c. Put dirt in front of gate 247 on the Eastside to stop leaking (broken stem or flapper).
 - d. Replaced meter on Kern Island 3-0-122.
 - e. Moved files from storage and cleaned out unit.
 - f. Worked gated 3-06-16 on the 13 Ditch to get it closed.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Replaced brakes and rotors on truck 216.
 - c. Mounted 3 new paper towel holders in shop and restrooms and fixed outside lights around shop.
 - d. Fixed fuel leak on John Deer 403.
 - e. Replaced condenser in 408 and charged system.
 - f. Replaced wheel bearing and sensor on truck 222.
3. **District Wells.**
 - a. Monthly service and inspection of all District Wells, clean well pads as needed.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Finished the Farmers Canal.
 - b. Branch 1 north of Panama Ln.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Dig up rodent holes on the Stine Canal.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Assisted with tree removal on Central Canal.
 - b. Loaded tree limbs on East Branch.
 - c. Help clean up homeless encampments.
 - d. Tree trimming on Kern Island.
7. **Backhoe # 408** The following jobs were completed this month;
 - a. Haul dirt from the Bladder to Romero, making a stockpile that's accessible during bad weather for breaks.
 - b. Hauled dirt to Kern Island southeast of McKee to repair erosion area.
 - c. Assisted in tree trimming on KI.
 - d. Dug up rodent holes on Eastside canal.
 - e. Loaded up scrap metal in yard and at Romero Basins and hauled to recycling facility.

8. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Finished BV.
 - b. Kern Island, Branch 1, 13 Ditch, and the 18 North & South.
 - c. Stine Canal from the head to end including the 15 Ditch, and the Branch II to McCutchen.
9. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
 - a. Drip treatment on the Eastside Canal at Redbank Rd. (pond weed/light moss).
 - b. Surface sprayed the Randall, 13 Ditch and the 20-foot (moss/Elodea).
10. **Rodent Control**
 - a. Bait stations were checked and filled throughout the district and moved the nonactive stations to areas with activity.
11. **Trash Removal.**
 - a. Clean trash racks throughout District.
 - b. Removed trash left behind from homeless encampments.
12. **Fence Repairs.** Fences and Gates were repaired at the following locations;
 - a. Stine Canal- at Grissom St.
 - b. Central Canal- at Union Ave and Belle Terrace.
 - c. Eastside Canal- at 30th St.
 - d. Kern Island Canal – at 34th, 4th, and 10th Streets
 - e. Branch 1- Harris Rd and Huges Ln.
 - f. BV Canal
 - g. Farmers Canal- at Harris Rd.
13. **Safety Meetings.** Weekly tailgate safety topics were;
 - a. Accident Prevention (District quarterly handout).
 - b. Protect Your Hearing at All Times.
 - c. The Importance of Safety Training.
 - d. Hand And Power Tools.
 - e. Defensive Driving.
14. **Water Banking Activities.** The following jobs were completed during the month;
 - a. Spot treat basins for weed control.
15. **Future Projects.** The following projects will be completed as time permits:
 - a. Evaluate and plan shutdown projects by District staff and outside contractors.
16. **Future Water Banking Projects.**
 - a. Install staff gauges at all basins.

Maintenance Report

October 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Cleaned water pump screens on the traveling screens.
 - b. Placed a steel plate on box 3-06-16 on the 13 Ditch to block off water, replaced bent stem, and removed rip-rap that was stuck in the frame and cover area.
 - c. Removed sediment buildup at 631A in front of gate 3-0-107.
 - d. Temporarily stopped leak from turnout vault on the Smith Judd Extension.
 - e. Kern Brothers Trucking finished hauling sand off-site at the head of the BV Canal.
 - f. Removed and trimmed trees on the BV Canal through town and on the Branch 2 Canal at Taft Hwy.
 - g. Trim trees to get grader through on Central between Sterling and Fairfax.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Replace battery on truck #213.
 - c. Repair air leak on truck #324.
 - d. Replaced belt tensioner on truck #216.
 - e. Trouble shoot #324 why dash, radio and climate controls don't work found and replaced DEF pump and wires shorted.
 - f. Cleaned up and organized the yard.
3. **District Wells.**
 - a. Monthly service and inspection of all District wells, clean well pads as needed.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Sloped the BV Canal and its laterals.
 - b. Eastside Canal from Bear Mountain working north to Fairfax.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Dug up rodent holes on the BV Canal south of Taft hwy.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Assisted with tree removal on BV canal.
 - b. Help with the cleanup of homeless encampments.
 - c. Tree trimming on Kern Island.
 - d. Dug up rodent holes on BV Basins feeder ditch.
7. **Backhoe # 408** The following jobs were completed this month;
 - a. Remove sediment buildup on the Central south of Arvin Edison's Intake Canal to the next road crossing.
 - b. Help with turnout 3-0-107 repair at 631A.
 - c. Dipped the Eastside Canal at the Hamilton and DiGiorgio weirs.
 - d. Hauled and placed rip-rap in the Stine Canal at the Old River basins to repair wash out from basin return flow back into canal.

8. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Eastside
 - b. Central and East Branch.
 - c. Spot sprayed the Farmers Canal.
9. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
 - a. Surface sprayed the Central below the lake to the Rim.
10. **Rodent Control**
 - a. Bait stations were checked and filled throughout the district and moved the nonactive stations to areas with activity.
11. **Trash Removal.**
 - a. Clean trash racks throughout District.
 - b. Removed trash left behind from homeless encampments.
 - c. Yard cleanup.
12. **Fence Repairs.** Fences and Gates were repaired at the following locations;
 - a. Stine Canal- Chester Ln. and Garnsey Ln.
 - b. Central Canal- Brundage Ln., Planz Rd. and Union Ave.
 - c. Eastside Canal- welded the southwest gate shut on Panama Ln.
 - d. Kern Island Canal – Columbus St.
 - e. Branch 1- White Ln.
 - f. BV Canal
 - g. Farmers Canal- Harris Rd. and Stine Rd.
13. **Safety Meetings.** Weekly tailgate safety topics were;
 - a. Fire Extinguishers.
 - b. Boosting PPE Compliance in the Workplace.
 - c. Why it's Important to Stay Hydrated During Cooler Temperatures.
 - d. Line of Fire Hazards.
14. **Water Banking Activities.** The following jobs were completed during the month;
 - a. Spot treat basins for weed control.
 - b. Dug up rodent holes on feeder ditch at BV basins.
15. **Future Projects.** The following projects will be completed as time permits:
 - a. Evaluate and plan shutdown projects by District staff and outside contractors.
16. **Future Water Banking Projects.**
 - a. Install staff gauges at all basins (received staff gauges).

Maintenance Report

November 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Build new trash screen for 5-0-201 on Stine canal.
 - b. Reattached gate to box with all thread and mortaring 5-0-174 on Stine canal.
 - c. Stine canal gate 5-0-168 cut and replace bad section of stem.
 - d. Stine canal gate 5-0-138 cut and replace bad section of stem.
 - e. Worked BV basins head gates to get them to close all the way.
 - f. Repair wash out on Randel.
 - g. Repair wash out do to gopher hole on Smith and Judd.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Replaced battery on truck #327.
 - c. Replaced water pump on 217 and installed door panal.
 - d. Tire repair on service truck #328.
 - e. Installed steps on trash truck #331.
 - f. Ford repaired truck #226.
 - g. Took spray truck in for warranty repair heater core.
3. **District Wells.**
 - a. Monthly service and inspection of all District wells, clean well pads as needed.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Finished Eastside canal and took to Quinn for new sloper attachment installed.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Dredge out Central canal from Arvin Edison crossing to Panama Ln.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Assist with tree cutting on Stine canal.
 - b. Cleaned Stine canal of trash and debris.
 - c. Remove tumbleweeds at Romero basins.
 - d. Haul a load of dirt to Smith and Judd.
7. **Backhoe # 408** The following jobs were completed this month;
 - a. Remove sediment from Arvin Edison crossing to Panama Ln on the Central canal.
 - b. Haul dirt and fix wash out on the Randel.
 - c. Fix wash out on Smith and Judd.
 - d. Remove sediment from several crossings, both up and down stream of crossings on the Stine canal.
8. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Spot treat Eastside canal what we could for arrowhead on canal bottom.
 - b. Spot treat BV for arrowhead.

- c. Sprayed Kern Island inside banks from 631 to head including 13 ditch, and 18 N and S.
- 9. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
 - a. Surface sprayed the Central below the lake to the Rim.
 - b. Surface sprayed Branch 1 return and 13 Ditch.
- 10. **Rodent Control**
 - a. Bait stations were checked and filled throughout the district and moved the nonactive stations to areas with activity.
 - b. Make some new bait stations for Rim and Central.
- 11. **Trash Removal.**
 - a. Clean trash racks throughout District.
 - b. Removed trash left behind from homeless encampments.
 - c. Went through the Stine canal and picked up trash/debris.
 - d. Cleaned up the Central from Arvin Edison north removing tumbleweeds and trash.
- 12. **Fence Repairs.** Fences and Gates were repaired at the following locations;
 - a. Stine Canal- District Blvd and Stockdale.
 - b. Central Canal- Planz and Brundage.
 - c. Eastside Canal- cut welds on the southwest gate on Panama Ln and attached chain with oil lease lock.
 - d. Kern Island Canal – Columbus St.
 - e. Branch 1-
 - f. BV Canal
 - g. Farmers Canal- Harris Rd. and Stine Rd.
- 13. **Safety Meetings.** Weekly tailgate safety topics were;
 - a. Relying On Memory.
 - b. Before A Work Task Begins.
 - c. Communication And Safety.
- 14. **Water Banking Activities.** The following jobs were completed during the month;
 - a. Cleaned up Romero basins.
- 15. **Future Projects.** The following projects will be completed as time permits:
 - a. Evaluate and plan shutdown projects by District staff and outside contractors.
- 16. **Future Water Banking Projects.**
 - a. Install staff gauges at all basins (received staff gauges).

Maintenance Report

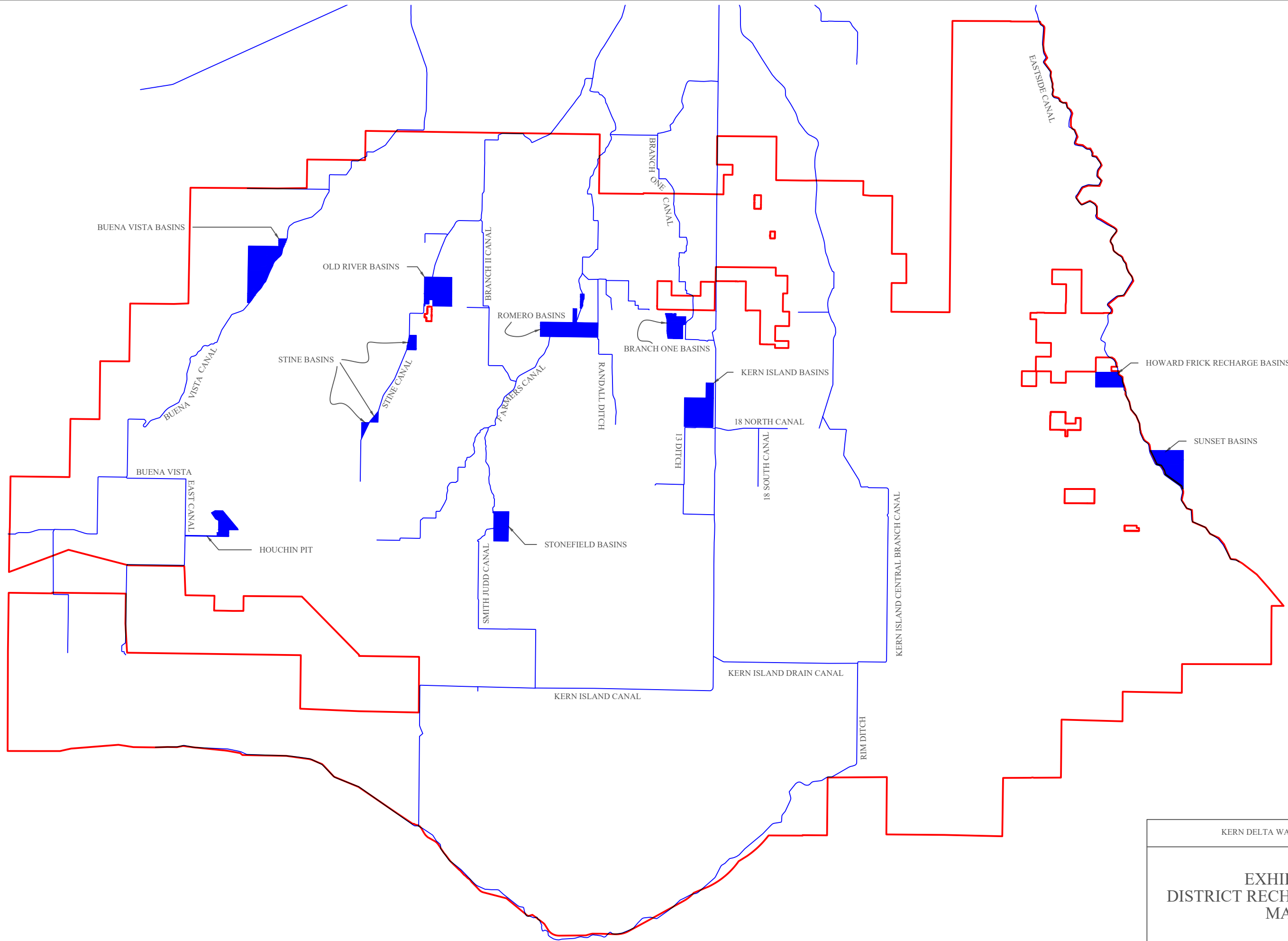
December 2023

1. **Structure and Turnout Repairs.** The following jobs were completed during the month.
 - a. Stine Canal replace stem on gate 3 5-0-138.
 - b. Built new screen for gate 3-2-247 on the Stine.
 - c. Replaced box and pipe upgrading to 24" 3-20-18 on Rim.
 - d. Installed box on the end of the 13 return ditch so we can back it up.
 - e. Head gate on the 15 Ditch had to attach back to box using all thread and mortar.
 - f. Replaced stem on Central gate 3-2-265.
 - g. Replaced stem on Central gate 3-2-253b.
 - h. Replaced rails and stem on 20' gate 34-0-135.
 - i. Inspected BV gates and weirs while waiting for Kern Island and Central to go off and drain down.
 - j. Long reach excavator cleaned from 4th St to P St then to Brundage Ln what he could from west bank, reshaping the side of bank and putting rest of sediment on side of road.
 - k. Long reach removed sediment upstream of 631 to power lines. Then 20" from weir 532 around the bend on north bank. Also cleaned out sediment on Drain by road crossing.
2. **Shop.** The following jobs were completed during the month;
 - a. Normal service and repairs on District vehicles and equipment.
 - b. Smog check truck #325 and #211.
 - c. Replace switch on wood saw out back.
 - d. Install new light on shop for yard.
 - e. Swap hoses on grader so controls were like they were before new sloper was put on.
3. **District Wells.**
 - a. Monthly service and inspection of all District wells, clean well pads as needed.
 - b. AE2 removed wood sound barrier do to wind damage.
4. **Motor Grader # 403** The following canals were sloped, and roads graded;
 - a. Sloped the 13 Ditch and 18 North and South.
5. **Backhoe # 402** The following jobs were completed during the month;
 - a. Assisted trash crew on canal clean-up on Kern Island and Central through town.
6. **Backhoe # 404** The following jobs were completed this month;
 - a. Assist with box installation on Rim 3-20-18.
 - b. Muck out Sec 5 ditch on Central.
 - c. Assisted trash crew on Stine canal and 15 Ditch.
 - d. Cleaned basins Branch 1 and Met.
7. **Backhoe # 408** The following jobs were completed this month;

- a. Assist with 13 return box installation.
 - b. Cleaned crossings on Stine canal as needed on upstream and downstream of road crossings from sediment from Ash upstream to New Stine.
 - c. Removed sediment from Central north of Panama Ln.
 - d. Cleaned Kern Island from 4th St to the Hwy 58 on east bank pulling sediment up on side of bank.
8. **Weed Spraying.** The following canals were sprayed during the month;
 - a. Put out preemergent in selected areas through out district to help suppress weed growth in hard to get areas and troubling areas.
9. **Aquatic Treatments.** Treatments including surface spraying for algae mats and injection treatments for control of algae or vascular aquatic weeds;
 - a. No treatments made this month.
10. **Rodent Control**
 - a. Bait stations were checked and filled throughout the district and moved the nonactive stations to areas with activity.
11. **Trash Removal.**
 - a. Clean trash racks throughout District.
 - b. Removed trash left behind from homeless encampments.
 - c. Went through the Kern Island and Central removing trash through town.
12. **Fence Repairs.** Fences and Gates were repaired at the following locations;
 - a. Stine Canal-
 - b. Central Canal- Locked gate to pole on Panama Ln (hinges were removed and they were welded to gate).
 - c. Eastside Canal-
 - d. Kern Island Canal –
 - e. Branch 1-
 - f. BV Canal
 - g. Farmers Canal-
13. **Safety Meetings.** Weekly tailgate safety topics were;
 - a. Human Performance.
 - b. Instant Gratification and Safety.
 - c. Four Focus Items For Work Area Inspections.
 - d. It Won't Happen To Me.
 - e. New Year, New Outlook On Safety.
14. **Water Banking Activities.** The following jobs were completed during the month;
 - a. Cleaned up Romero, Met, and Branch 1 Basins.
15. **Future Projects.** The following projects will be completed as time permits:
 - a. Evaluate and plan on future projects.
16. **Future Water Banking Projects.**
 - a. Install staff gauges at all basins (received staff gauges).

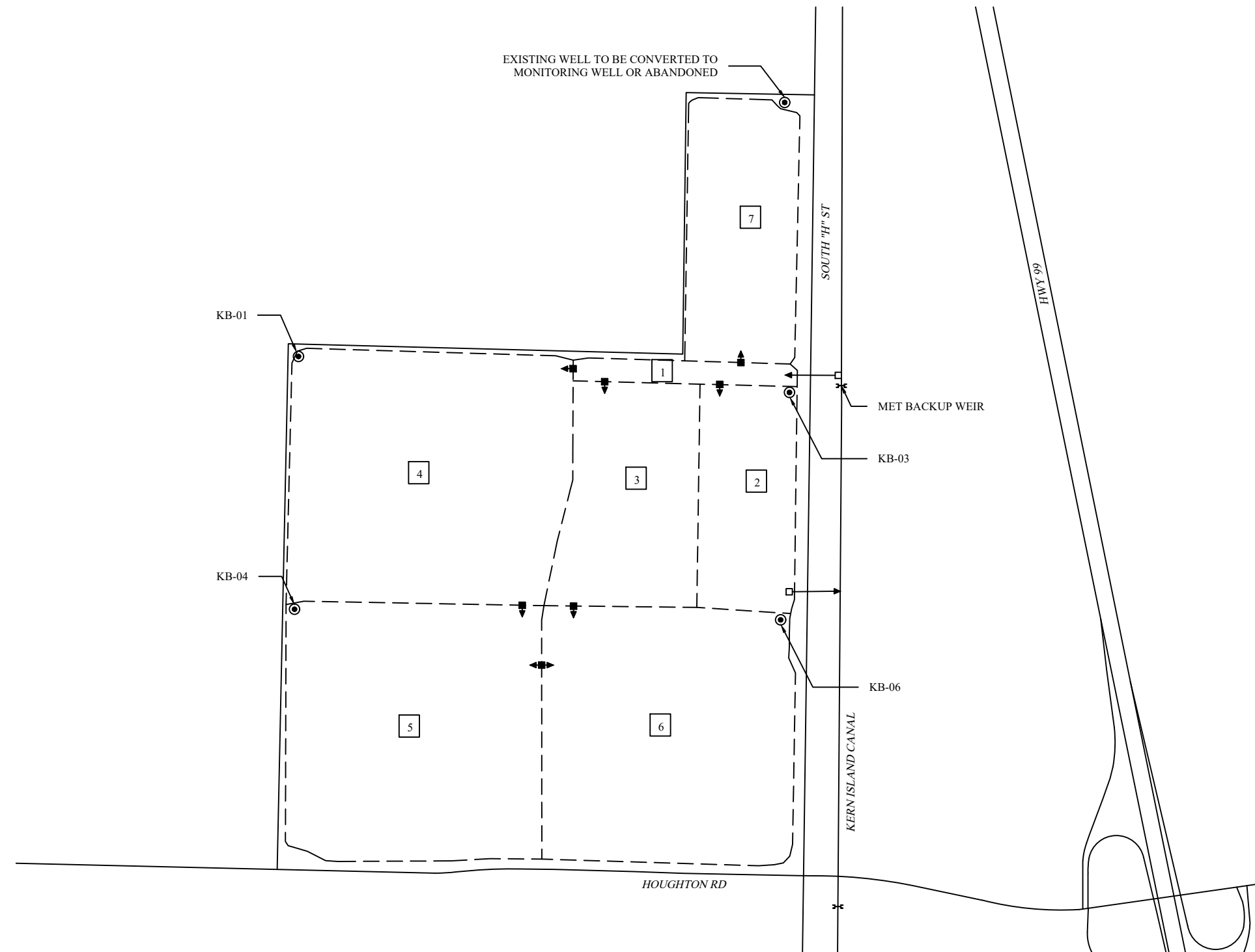


Appendix B



KERN DELTA WATER DISTRICT

EXHIBIT 1
DISTRICT RECHARGE BASINS
MAP

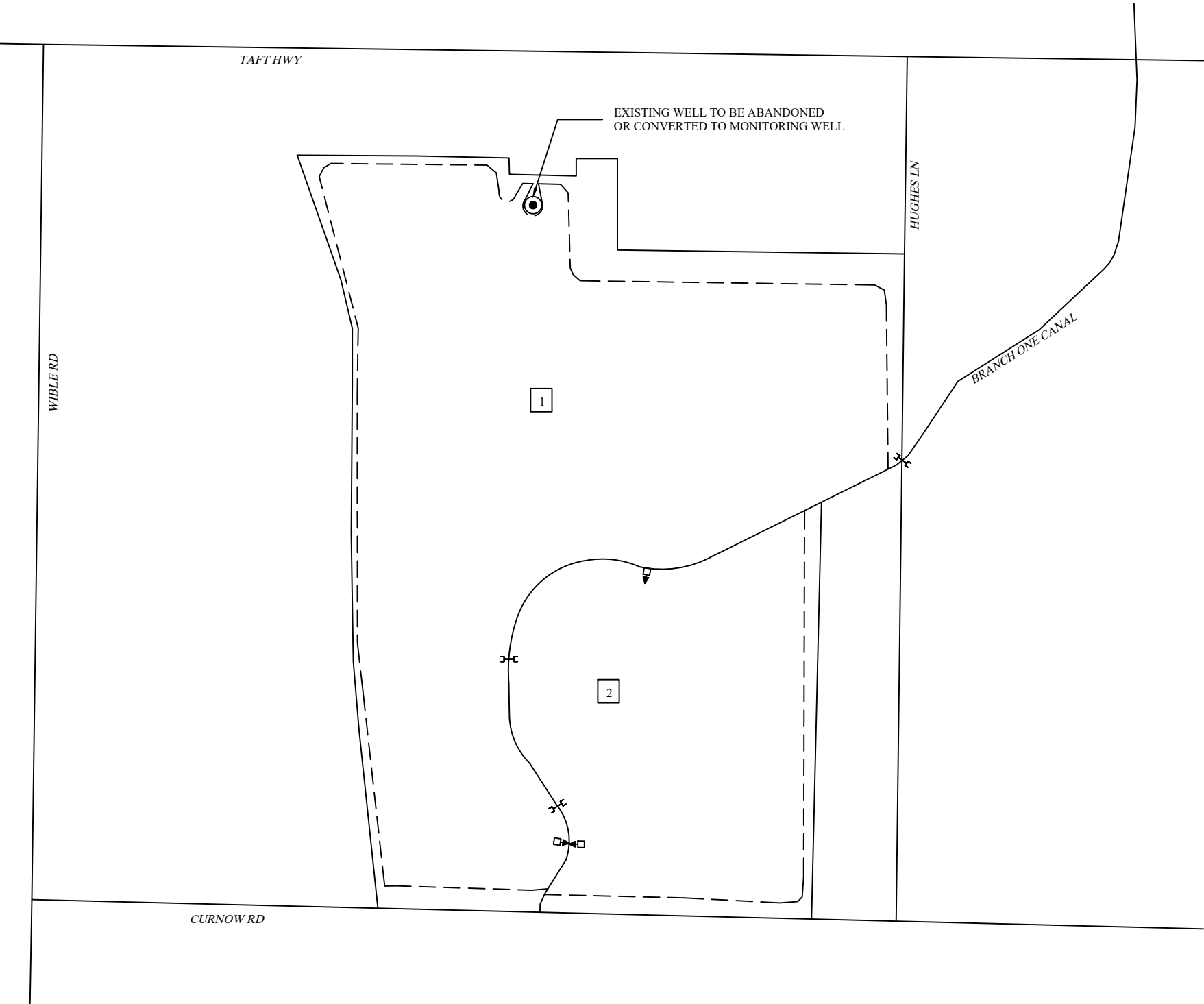


LEGEND

- OF EXISTING LEVEE
- # POND NUMBER
- ABANDONED WELL
- SCALE: NOT TO SCALE
- ◀ INTERBASIN STRUCTURE
- ◀◻ INLET/OUTLET STRUCTURE
- ⊙ EXISTING WELL

KERN DELTA WATER DISTRICT

EXHIBIT 2 KERN ISLAND BASINS

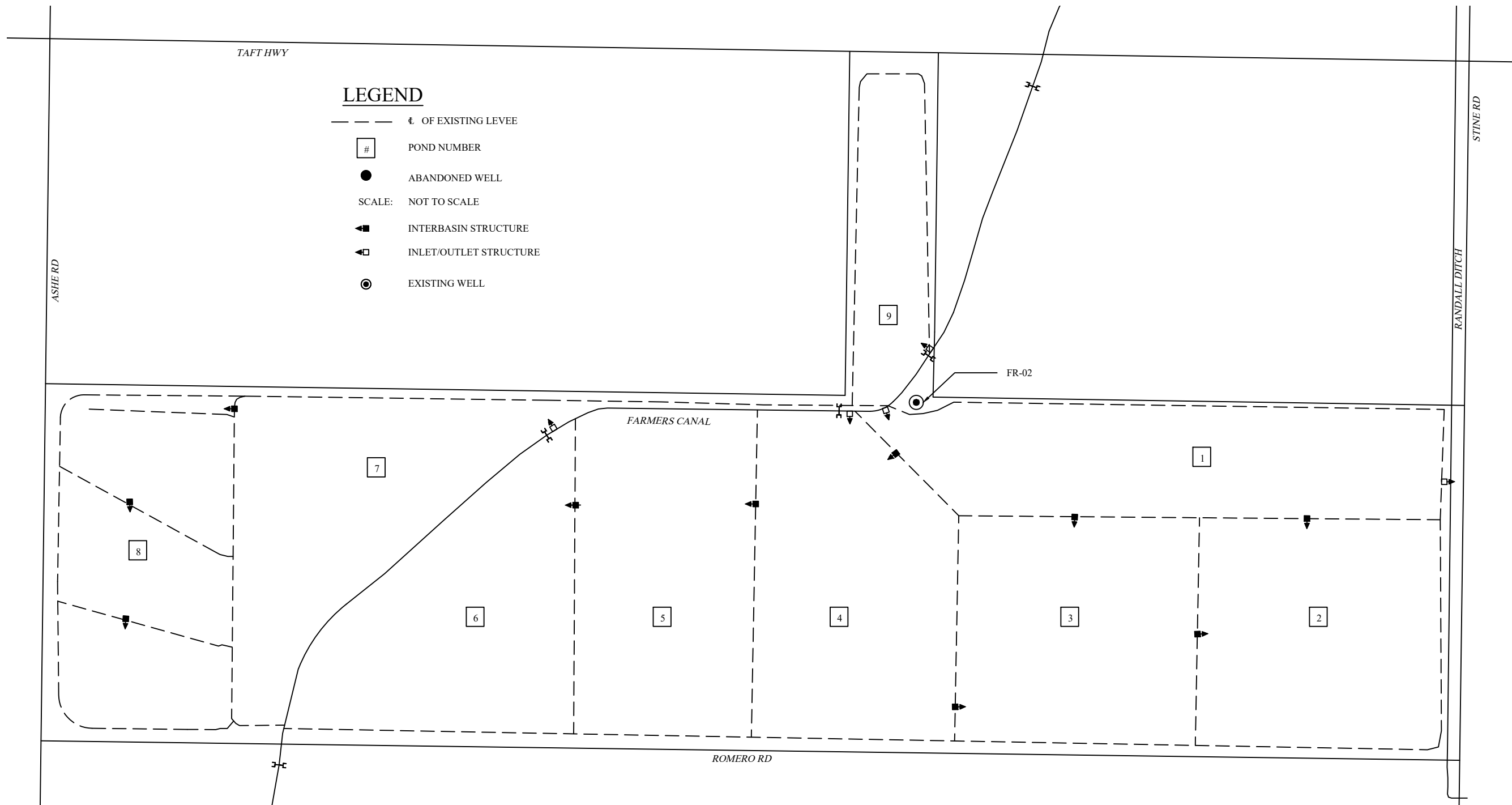


LEGEND

- OF EXISTING LEVEE
- # POND NUMBER
- ABANDONED WELL
- SCALE: NOT TO SCALE
- ◀ INTERBASIN STRUCTURE
- ◻ INLET/OUTLET STRUCTURE
- ⊙ EXISTING WELL

KERN DELTA WATER DISTRICT

**EXHIBIT 3
BRANCH ONE BASINS**

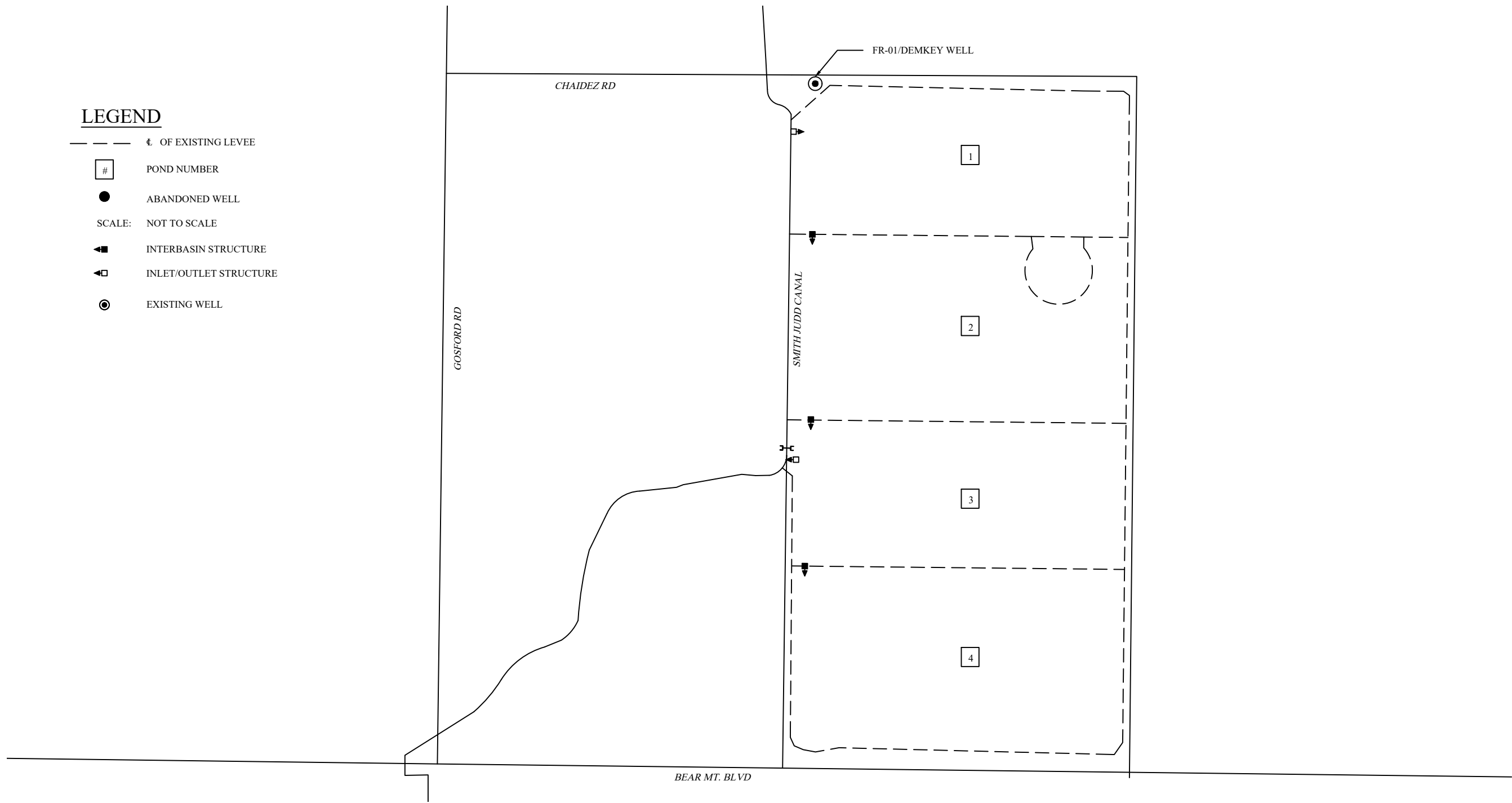


KERN DELTA WATER DISTRICT

EXHIBIT 4
ROMERO BASINS

LEGEND

- OF EXISTING LEVEE
- # POND NUMBER
- ABANDONED WELL
- SCALE: NOT TO SCALE
- ◀ INTERBASIN STRUCTURE
- ◀ INLET/OUTLET STRUCTURE
- ⊙ EXISTING WELL



KERN DELTA WATER DISTRICT

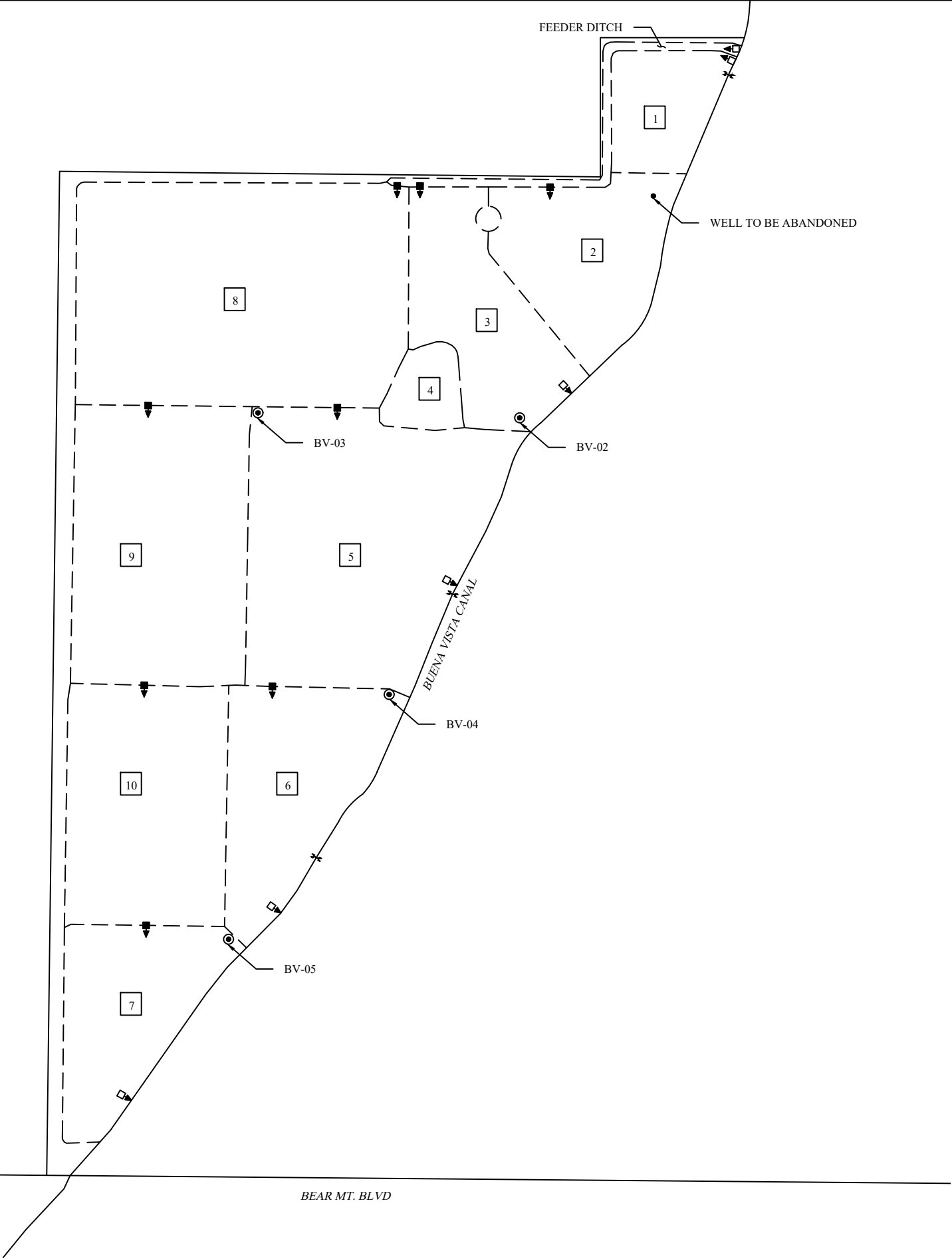
EXHIBIT 5
STONEFIELD BASINS

LEGEND

- OF EXISTING LEVEE
- #

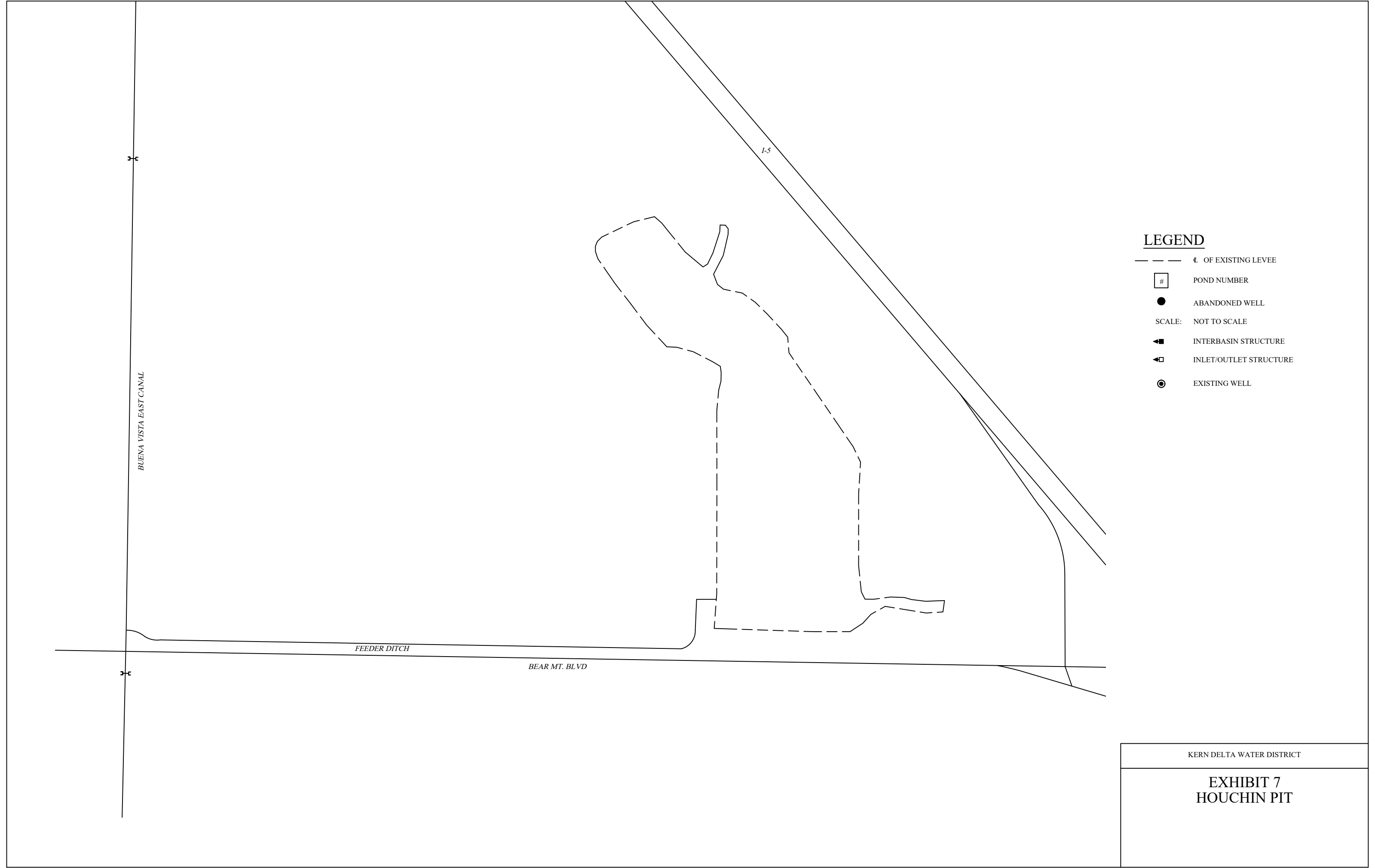
POND NUMBER
- ABANDONED WELL
- SCALE:

NOT TO SCALE
- INTERBASIN STRUCTURE
- INLET/OUTLET STRUCTURE
- EXISTING WELL



KERN DELTA WATER DISTRICT

EXHIBIT 6
BUENA VISTA BASINS

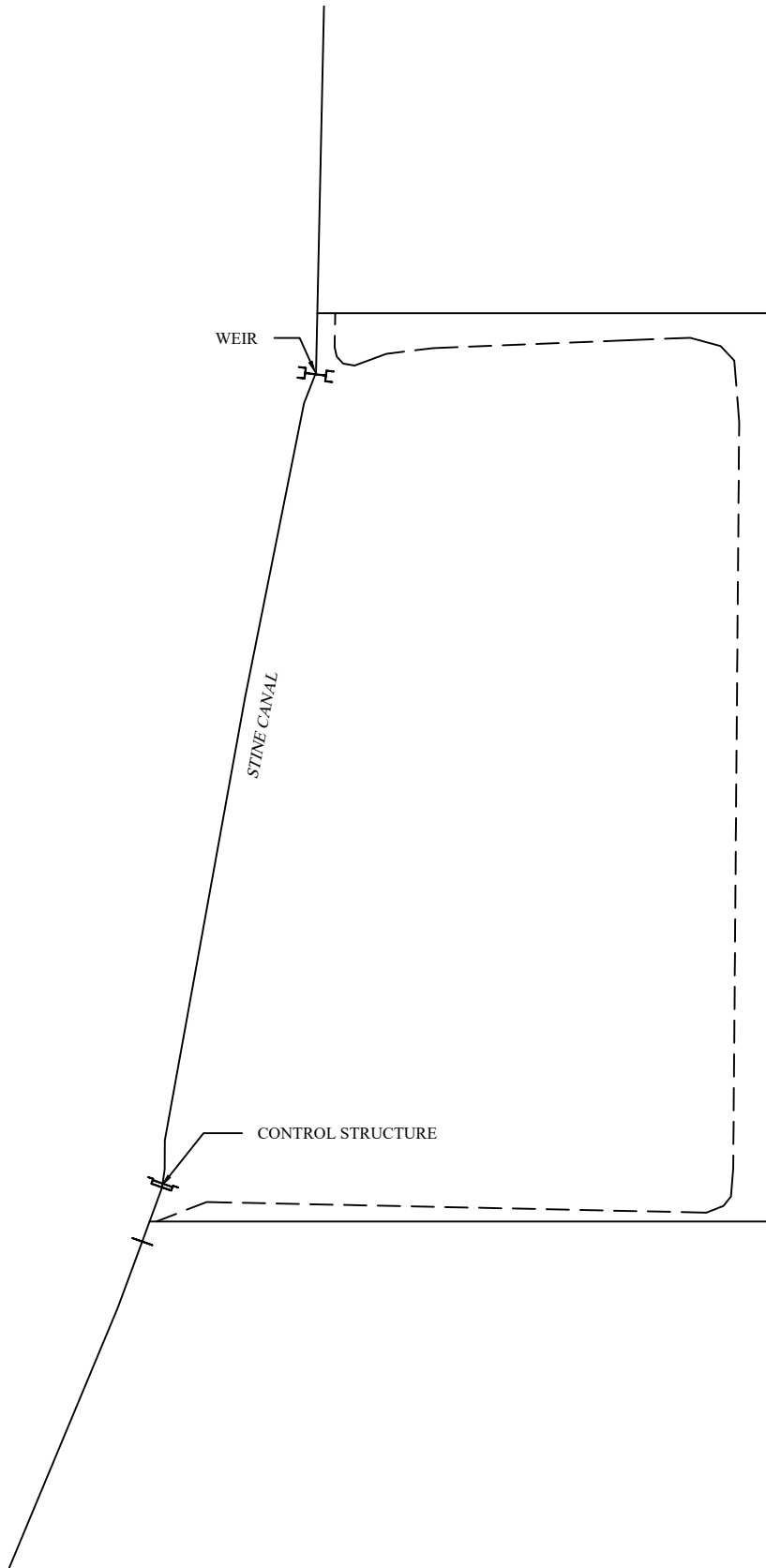


LEGEND

- OF EXISTING LEVEE
- # POND NUMBER
- ABANDONED WELL
- SCALE: NOT TO SCALE
- ◼ INTERBASIN STRUCTURE
- ◻ INLET/OUTLET STRUCTURE
- ⊙ EXISTING WELL

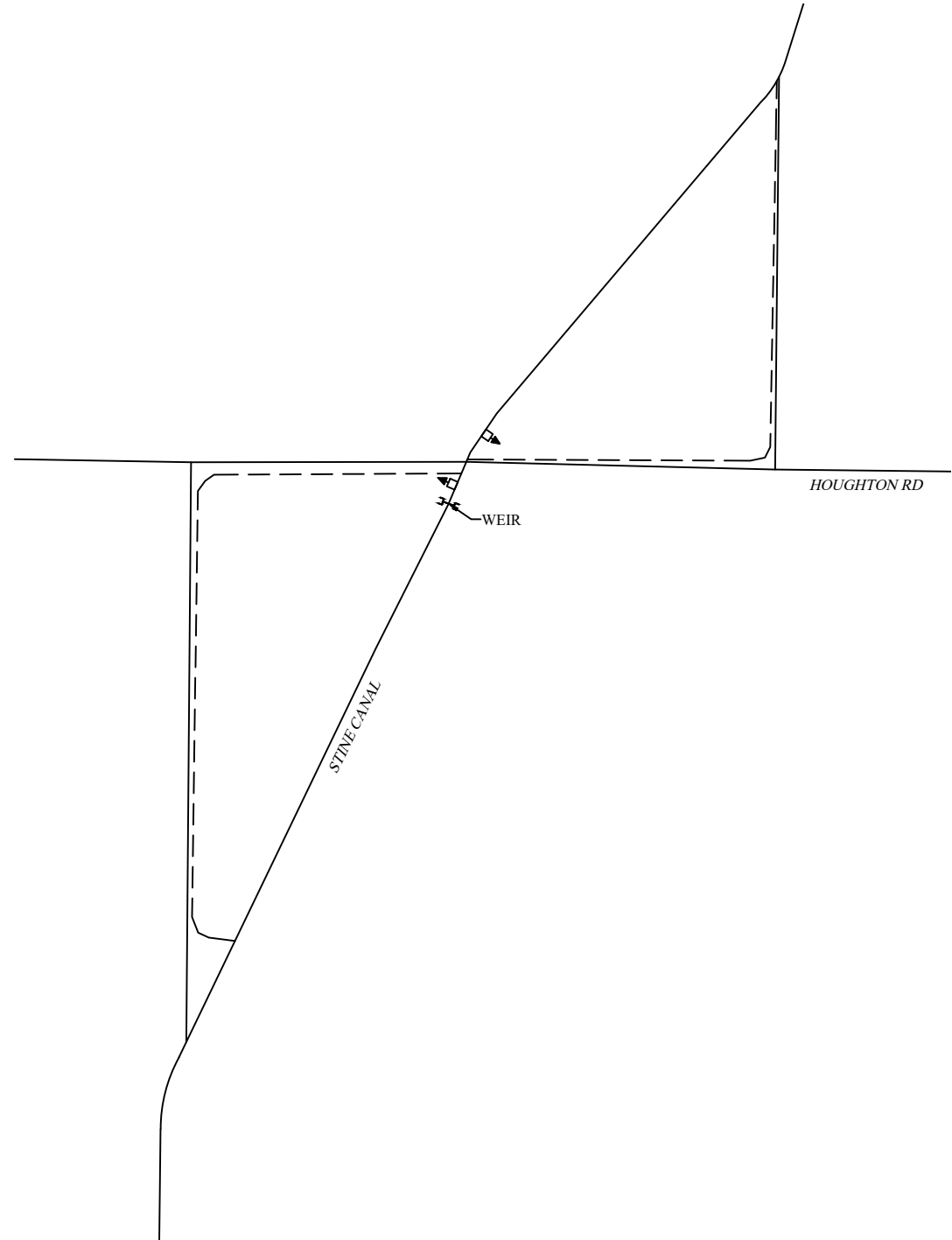
KERN DELTA WATER DISTRICT

**EXHIBIT 7
HOUCHIN PIT**



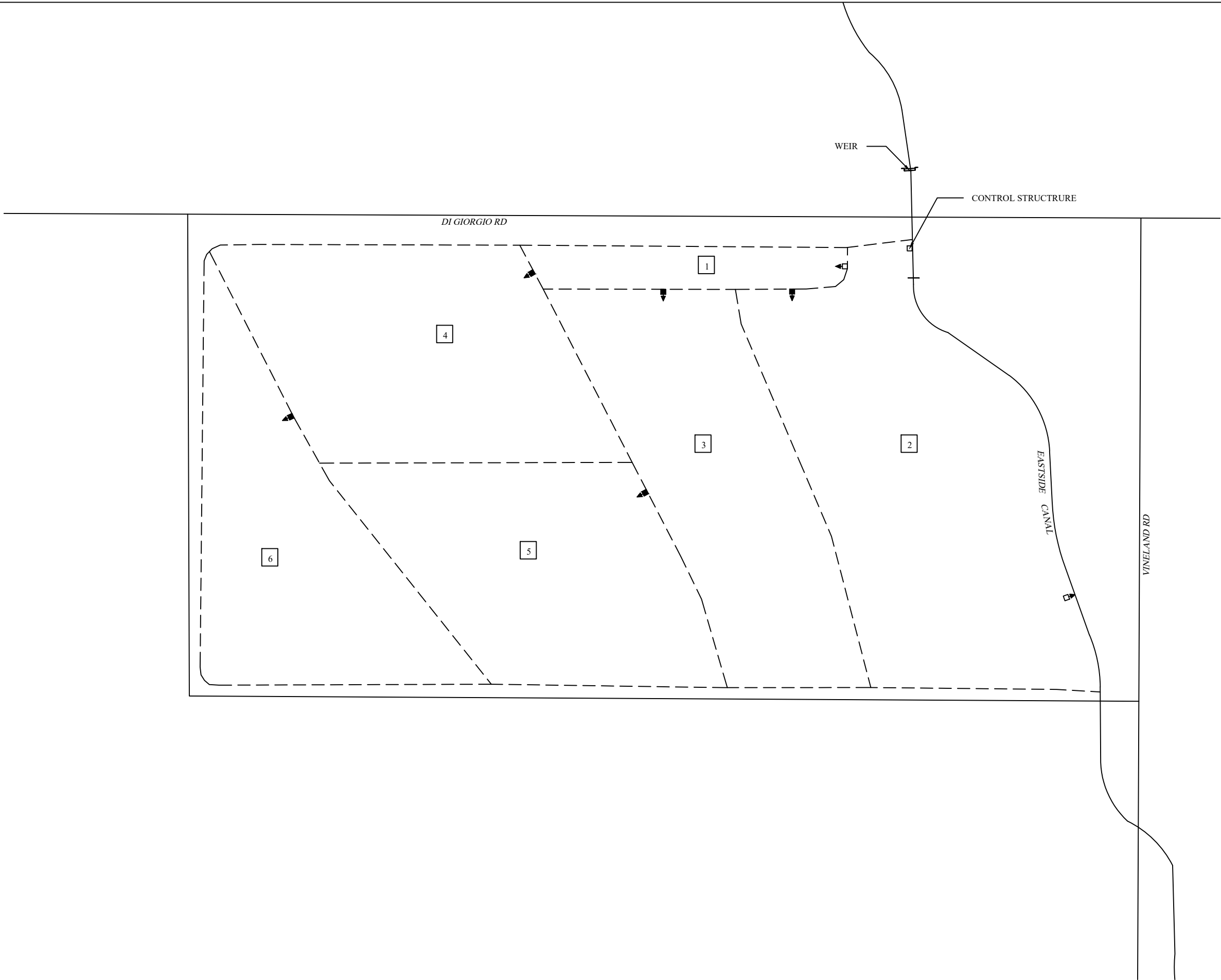
LEGEND

- OF EXISTING LEVEE
- # POND NUMBER
- ABANDONED WELL
- SCALE: NOT TO SCALE
- ◀ INTERBASIN STRUCTURE
- ◀ INLET/OUTLET STRUCTURE
- ⊙ EXISTING WELL



KERN DELTA WATER DISTRICT

EXHIBIT 8 STINE BASINS

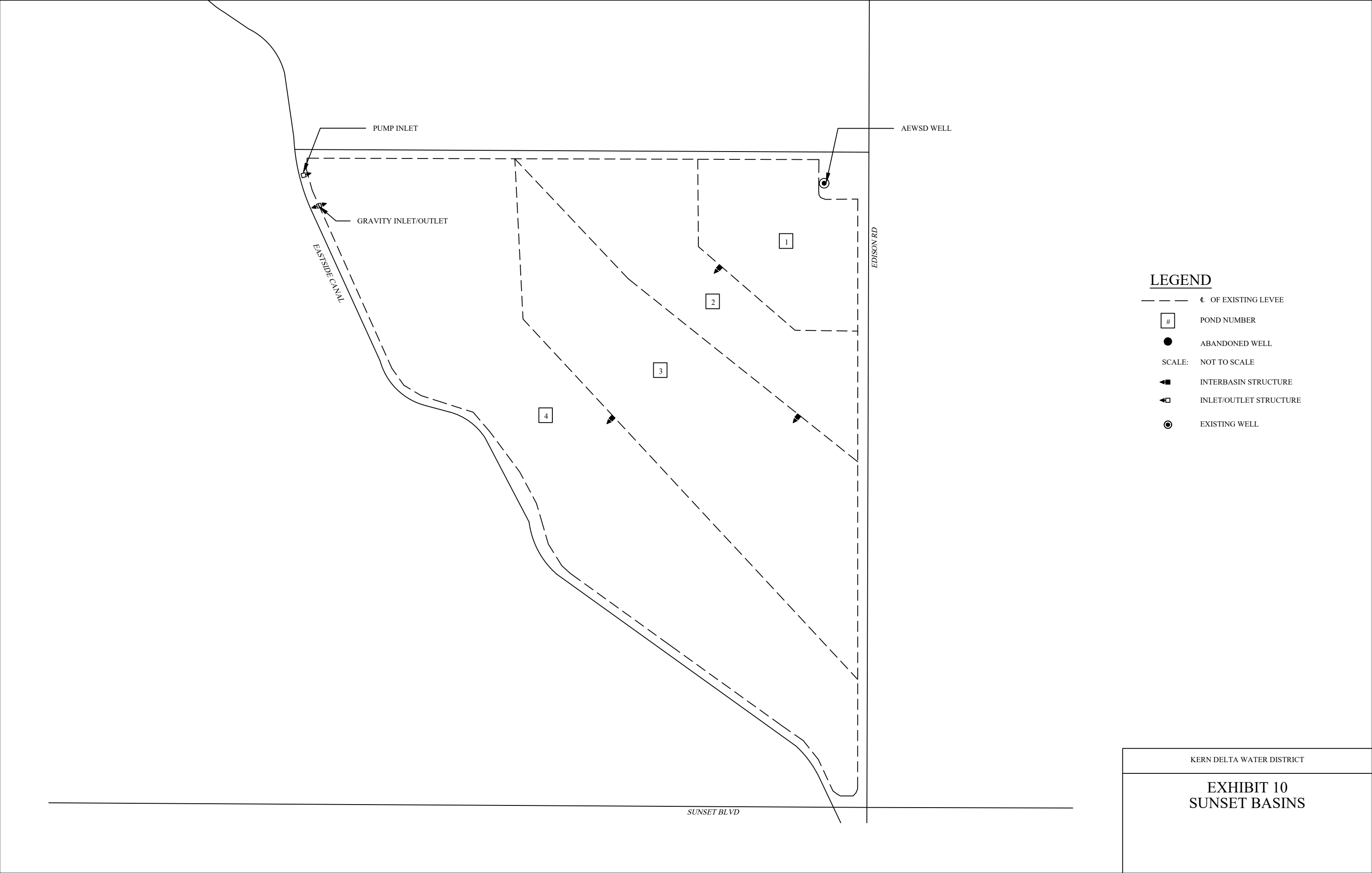


LEGEND

- OF EXISTING LEVEE
- # POND NUMBER
- ABANDONED WELL
- SCALE: NOT TO SCALE
- ◼ INTERBASIN STRUCTURE
- ◻ INLET/OUTLET STRUCTURE
- ⊙ EXISTING WELL

KERN DELTA WATER DISTRICT

**EXHIBIT 9
H. FRICK RECHARGE FACILITY**

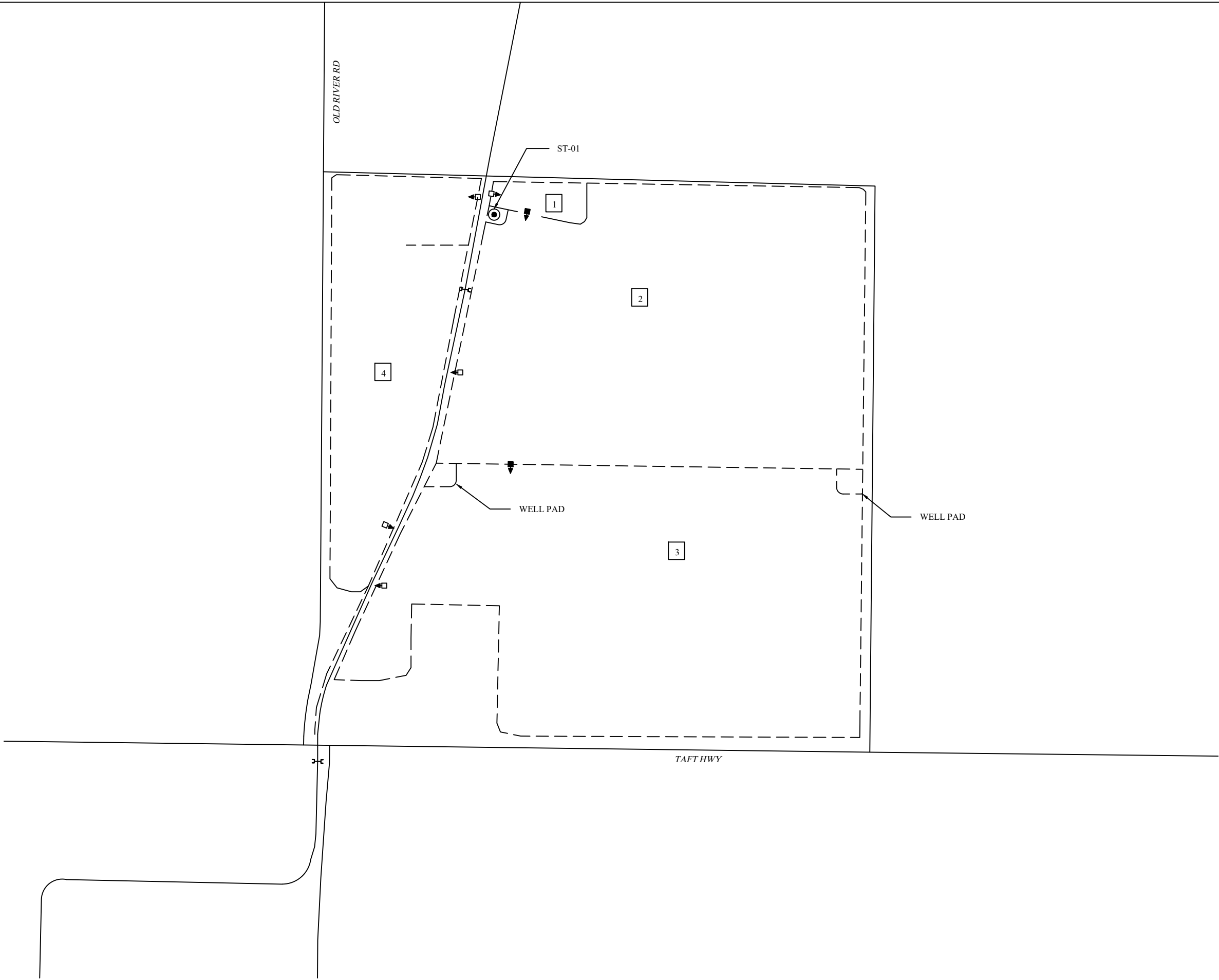


LEGEND

- OF EXISTING LEVEE
- # POND NUMBER
- ABANDONED WELL
- SCALE: NOT TO SCALE
- ◀■ INTERBASIN STRUCTURE
- ◀◻ INLET/OUTLET STRUCTURE
- ⊙ EXISTING WELL

KERN DELTA WATER DISTRICT

**EXHIBIT 10
SUNSET BASINS**



LEGEND

--- OF EXISTING LEVEE

POND NUMBER

● ABANDONED WELL

SCALE: NOT TO SCALE

◄ INTERBASIN STRUCTURE

◄ INLET/OUTLET STRUCTURE

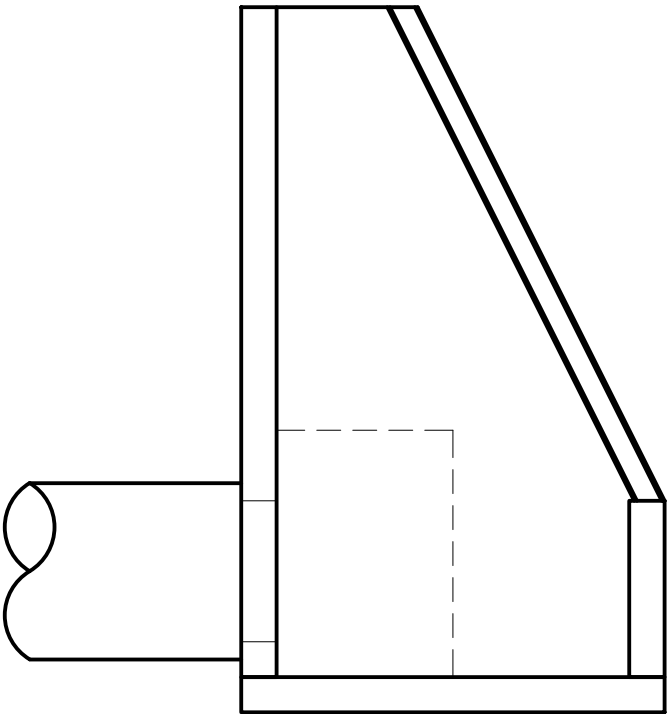
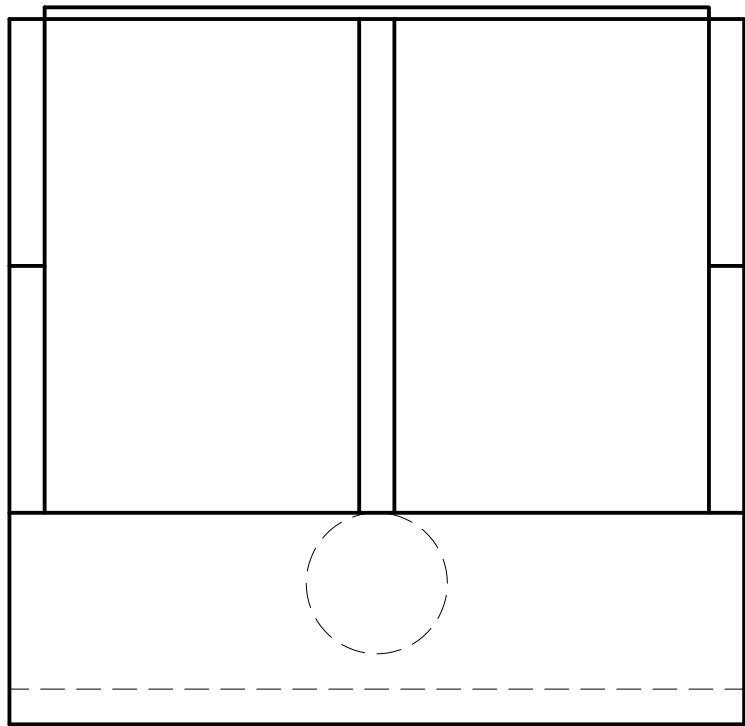
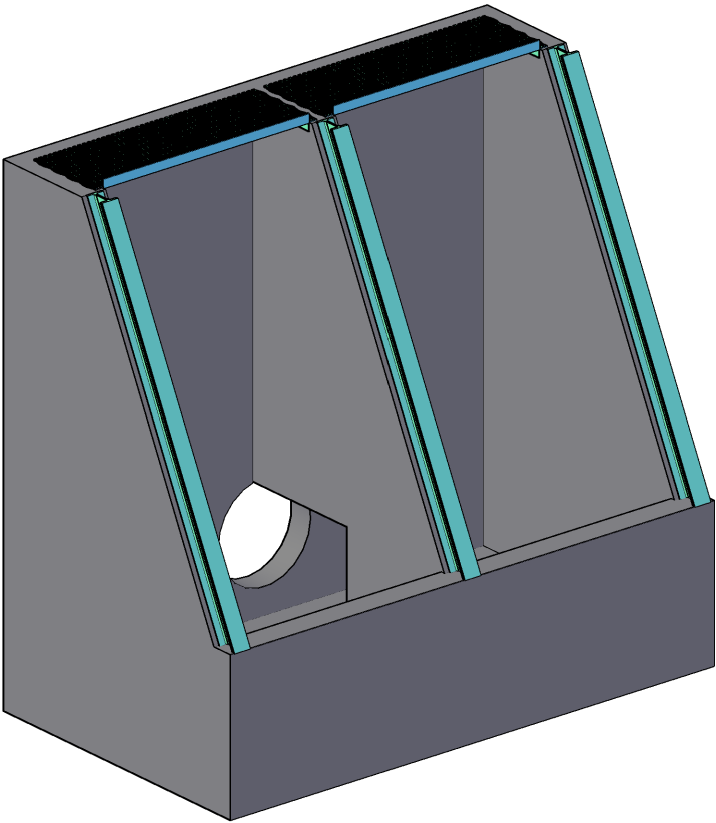
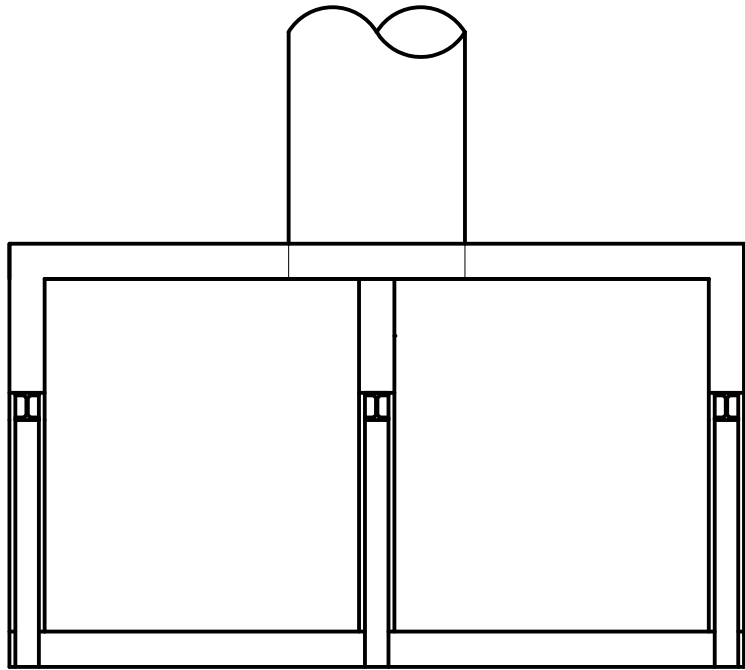
⊙ EXISTING WELL



KERN DELTA WATER DISTRICT

EXHIBIT 12
STINE CANAL
PROPOSED PIPELINE

13 DITCH RETURN STRUCTURE



KERN DELTA WATER DISTRICT

EXHIBIT 13
13 DITCH RETURN
OVERFLOW STRUCTURE



KERN DELTA WATER DISTRICT

**EXHIBIT 14
KERN ISLAND & CENTRAL
PROPOSED MODIFICATIONS**



KERN DELTA WATER DISTRICT

EXHIBIT 15
RIM DITCH
PROPOSED REGULATION PONDS