Mohave Valley
Irrigation and Drainage District

Water Conservation Plan

2019

Updated By:
Kerri Hatz
General Manager

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Step 1 – Description of Contract Area

A. History

The Mohave Valley Irrigation and Drainage District (MVIDD or District) has been in existence for over 50 years.

The District is a special taxing district created under Title 48 of the Arizona Revised Statutes. The District was formed on December 23, 1963, under Mohave County Board of Supervisors Resolution Number 248.

The District is managed by a Board of Directors. Upon the District's formation, 3 directors were elected, 1 from each division. In 2004, the District increased the number of directors to 5. The board is currently comprised of one director from each of the 3 divisions and 2 at large. Elections are held in November and directors take office in January.

The District entered into its first U.S. Bureau of Reclamation (USBR) contract on November 14, 1968, in the amount of 51,000 acre-feet of Colorado River water (contract no. 14-06-W-204). This contract stipulated that a reduction of no more than 10,000 acre-feet of water could be made if the District does not include within its boundaries such areas of additional lands as may be satisfactory to the Secretary, and if facilities for providing water service to said additional lands and to the residents therein are not available. On July 7, 1982, the USBR entered into contract number 2-07-30-

W0027 with Mohave County for said 10,000 acre-feet of Colorado River water. This contract was subsequently transferred to the City of Bullhead City on December 2, 1985. These transactions reduced the District's water entitlement under contract 14-06-W-204 to 41,000 acre-feet. Of the 41,000 acre-feet entitlement, 5,940 acre-feet are Present Perfected Rights (PPR) and 35,060 acre-feet are 4th priority water. Any unused PPR water is converted to 4th priority water on an annual basis.

On December 17, 2009, the District entered into sub-contract number 09-101 for the purchase of 1,000 acre-feet of Colorado River water from the Mohave County Water Authority. With the completion of this sub-contract, the District's total water entitlement rose to 42,000 acre-feet. On September 08, 2015, the District acquired an additional 250 acre-feet of 4th priority Colorado River water pursuant to MCWA-MVIDD subcontract 09-101, Amendment No. 1 and the District's total water entitlement rose to 42,250 acre-feet.

The District, as the contract holder, has the right to subcontract its entitlement to entities and individuals located within the District boundaries (excluding Fort Mohave Tribal Reservation Lands). This is carried out in compliance with District Policies and Arizona Department of Water Resources (ADWR) guidelines. The District has allocated water to agricultural, amenity, municipal, residential, industrial and commercial subdivisions and individual users within its boundaries.

The District uses water not only for agricultural irrigation, but also for M & I purposes. M & I uses include amenity (golf courses, water amenity), commercial entities, industrial uses, residential subdivisions and individual domestic users.

B. Location

The District is located in northwestern Arizona in Mohave County. The District lies along the Colorado River within the flood plain between the cities of Bullhead City, Arizona, to the north and Needles, California to the south.

The legal description of the District is as follows:

MOHAVE VALLEY IRRIGATION

and

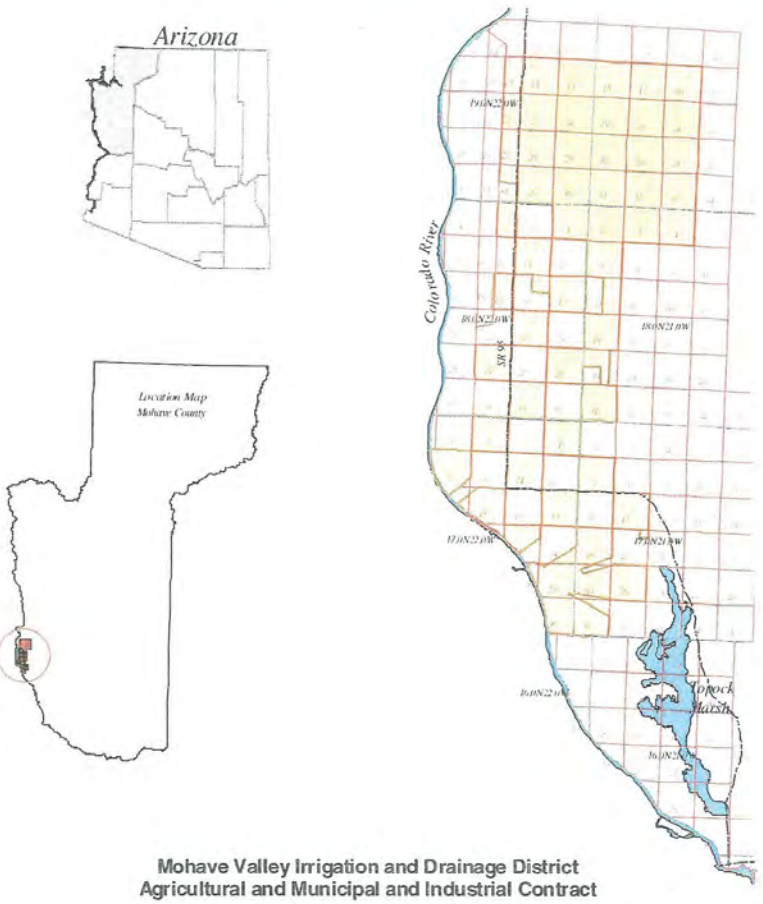
DRAINAGE DISTRICT

District Boundary Description

Beginning at the northeast corner of Section 16, T.19 N., R.21 W., G.&S.R.B.&M.; thence southerly along the east line of Sections 16, 21, 28, and 33, T.19 N., R.21 W., to the southeast corner of said Section 33; thence southerly along the east line of Section 4, T.18 N., R.21 W., G.&S.R.B.&M., to the southeast corner of said Section 4; thence westerly along the south line of Sections 4 and 5 to the southwest corner of said Section 5; thence southerly along the east line of Sections 7, 18, 19, 30, and 31, T.18 N., R.21 W., to the southeast corner of said Section 31; thence southerly along the east line of Section 6, T.17 N., R.21 W., G.&S.R.B.&M., to the southeast corner of said Section 6; thence easterly along the south line of Section 5 to the southeast corner of said Section 5; thence southerly along the east line of Sections 8, 17, 20, 29, and 32, T.17 N., R.21 W., to the southeast corner of said Section 32; thence westerly along the south line of Sections 32 and 31, T.17 N., R.21 W., to the southwest corner of said Section 31; thence westerly along the south line of Section 36, T.17 N., R.22 W., to the easterly bank of the Colorado River; thence northerly following the meanderings of the easterly bank of the Colorado River to its intersection with the south line of the Fort Mohave Indian Reservation, said intersection lying in fractional Section 21, T.18 N., R.22 W, G.&S.R.B.&M.; thence EA westerly along the south line of the Fort Mohave Indian Reservation to its intersection with the west line of Section 22; thence northerly along the west line of Section 22 to the northwest corner of said Section 22; thence easterly along the north line of Section 22 to the southwest corner of fractional Section 15, T.18 N., R.22 W., G.&S.R.B.&M., thence northerly along the west line of fractional Sections 15, 10, and 3, T.18 N., R.22 W., G.&S.R.B.&M. to the northwest corner of said fractional Section 3; thence northerly along the west line of fractional sections

34, 27, 22 and 15, T.19 N., R.22 W., G.&S.R.B.&M., to the northwest corner of said fractional Section 15; thence easterly along the north line of fractional Section 15, 14, and 13, T.19 N., R.22 W. to the northeast corner of said Section 13; thence easterly along the north line of Section 18, 17, and 16, T.19 N., R.21 W., to the point of beginning. Except any portion of the above lying within the State of California.

Mohave Valley Irrigation and Drainage District



Mohave Valley Irrigation and Drainage District
Agricultural and Municipal and Industrial Contract

Contract No. 14-06-W 204
Total Entitlement - 41,000 Acre Feet
1st Priority - 5,940 Acre Feet
4th Priority - 35,060 Acre Feet
5th and/or 6th Priority - 600 Acre Feet

Mohave Valley Irrigation and Drainage District Contract Area

July 23, 2003
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C. Size

The petition filed to form the District stated that approximately 57,000 acres were to be benefited by the District. This acreage included the lands of the Fort Mohave Indian Tribe, approximately 23,000 acres. Subsequent to the formation of the District petitioners, including the Fort Mohave Indian Tribe, requested and were granted exclusion from the District. Many years later, the petitioners requested and were granted inclusion into the District.

The District's current exterior boundaries encompass 54,551 acres. That acreage includes 23,064 acres that are part of the Fort Mohave Indian Tribe Reservation. This leaves 31,487 acres within the District Boundaries that are under the District's water reporting contract with the Bureau of Reclamation.

The total agricultural irrigable lands within the District at this time are approximately 4,961 acres. There are also 3 golf courses and 2 man-made lakes within the District.

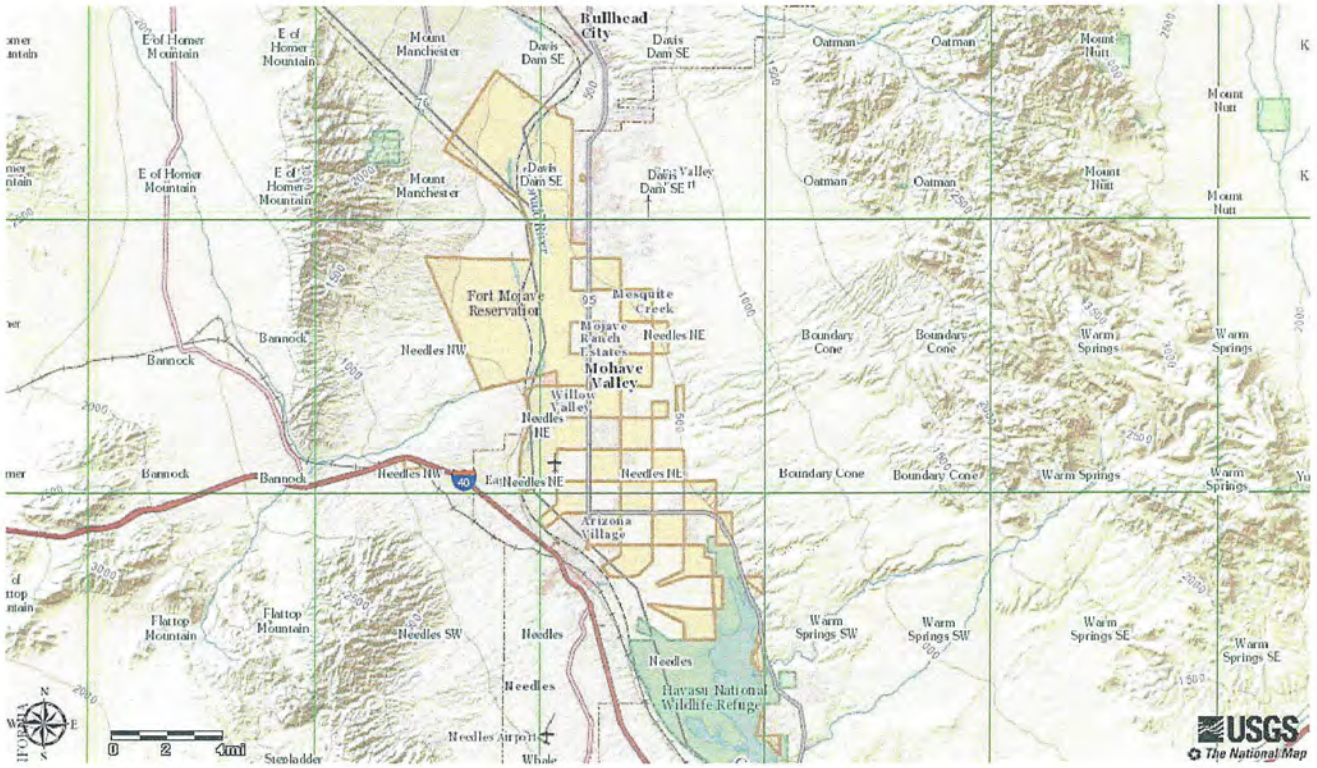

MVIDD Divisional Boundary Map - 2009
Division 1
Division 2
Division 3
Federal State or County Lands
Mohave Valley
Fort Mojave
Fort Mohave County
FMIR
Excluded May 1986

D. Topography

The topography of the District is primarily level to nearly level alluvium along the Colorado River. Some areas downgrade toward the river. The elevation is primarily 500 feet, but rises to approximately 800 feet in the far northeast section of the District.

Mohave Valley Irrigation And Drainage District and Surrounding Area

NOTES: Data available from U.S. Geological Survey, National Geospatial Program.



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E. Soils

Soils within the District consist of a variety of compositions. Over 50% are considered "Prime Farmland if Irrigated."

Table 1.0*

Soil Type	Slope Percent	Percent of District	Drainage	Infiltration Rate	Irrigation Limitation	Farmland Rating
Carrizo –River wash Complex	3 – 8	11.3%	Excessively drained	High	Very limited	Not prime
Chuckawalla – River bend Complex	2 – 15	2.5%	Well drained	Moderate	Very limited	Not prime
Coolidge-Denure families complex	1 – 7	4.7%	Well drained	Moderate	Very limited	Not prime
Gadsden silty clay	0 – 1	3.4%	Well drained	Very slow	Somewhat limited	Prime if irrigated
Holtville silty clay	0 – 1	12.6%	Well drained	Very slow	Very limited	Prime if irrigated
Huevi very gravelly loam	2 – 15	0.4%	Well drained	Moderate	Very limited	Not prime
Huevi very gravelly loam	10 - 40	0.5%	Well drained	Moderate	Very limited	Not prime
Indio silt loam	0 – 1	16.1%	Well drained	Moderate	Very limited	Prime if irrigated
Kofa silty clay	0 – 1	5.2%	Well drained	Slow	Very limited	Prime if irrigated
Lagunita sand	0 – 1	16.3%	Excessively drained	High	Very limited	Not prime
Meloland very fine sandy loam	0 – 1	3.8%	Well drained	Slow	Somewhat limited	Prime if irrigated
Ripley silt loam	0 – 1	14.5%	Well drained	Moderate	Very limited	Prime if irrigated
River bend very cobbly sandy loam	2 - 15	1.8%	Excessively drained	High	Very limited	Not prime
Rositas superstition family and torriorthents soils	1 - 60	6.9%	Somewhat excessively drained	High	Very limited	Not prime

* Source of information from N.R.C.S. (See appendix A for soils maps.)

F. Natural Environment

Vegetation –

The District lies within two biomes. The majority of the District lies within the Mohave Desert scrub biome. The southwest portion of the District lies within the Lower Colorado River Sonoran Desert scrub biome.

- Mohave Desert Scrub Biome - This biome consists primarily of creosote bush, brittlebush, diamond cholla, beavertail cactus, white bursage, Mormon tea, catclaw acacia, desert lavender, bebbia, ratney, and desert milkweed.

- Lower Colorado River Sonoran Desert Scrub Biome - This biome consists primarily of creosote bush and white bursage. These are two of the most drought resistant plants in America. Annual plant species comprise over 50% of the vegetation. They are mostly winter growing species.

Wildlife –

The abundance of wildlife or lack thereof, is in direct correlation to the amount and type of vegetation available. There are several types of mammals known to inhabit the area including, several small species of mice, desert woodrat, coyote and desert bighorn sheep. Overall densities of these mammals are expected to be low.

There are approximately 25 species of birds that could potentially inhabit the area, and they include the verdins, black-throated sparrows, and black-tailed gnatcatchers. Overall the densities of bird populations are expected to be low.

The area also has many reptile species. These include the side-blotched lizard, western brush lizard, and the Mohave rattlesnake.

In 1995, the U.S. Department of Interior and the States of Arizona, Nevada, and California entered into a Memorandum of Agreement and a Memorandum of Clarification for the development of a Lower Colorado River Multi-Species Conservation Program (LCRMSCP). The LCRMSCP is a partnership between federal, state, tribal, and other public and private stakeholders with an interest in managing water and related resources within the Lower Colorado River Basin. The partnership is pursuing an ecosystem-based approach to developing the LCRMSCP for interim and long-term compliance with applicable endangered species and environmental laws. The District is a participant in this program.

G. Cultural Resources

The District encompasses 54,551 acres of land within its external boundaries. The Fort Mohave Indian Reservation has 23,064 acres of land within the boundaries of the District.

H. Climate

The average annual temperature for the District is above Arizona and the national average. The average precipitation is below Arizona and the national average. The average annual humidity is below Arizona and the national average. The average wind speed is above Arizona and the national average. The climate in the District is hot, dry, and windy.

Table 1.1*

Month	Temperature Average Daily Maximum	Temperature Average Daily Minimum	Precipitation Average (Inches)
January	64.0	42.1	0.63
February	69.7	45.6	0.55
March	76.4	50.1	0.48
April	84.8	57.6	0.23
May	94.3	66.9	0.08
June	104.1	76.1	0.03
July	108.9	83.6	0.32
August	106.8	81.8	0.61
September	100.9	74.1	0.42
October	88.1	61.6	0.29
November	73.5	49.7	0.35
December	63.8	42.2	0.44
Annual	86.3	60.9	4.44

*Source of information from the Western Regional Climate Center, wrcc@dri.edu. Data for the Needles FAA Airport, California. Compiled for the period 1/01/1941 to 06/09/2016.

I. Water Supplies

A summary of the water supplies available within the District service area is detailed in the following tables.

Water Sources
Table 1.2

Water Source	2000 Acre-Feet	2005 Acre-Feet	2013 Acre-Feet	2018 Acre-Feet
Reclamation Water Contract	41,000	41,000	41,000	41,000
Local Surface Water	0	0	0	0
Groundwater	0	0	0	0
Bella Vista/ MCWA Contract	0	0	380	0
MCWA Contract 2009	0	0	1000	1,250
Reclaimed Water	69*	151 *	206**	255 **
Other Water	0	0	0	0
Total	41,069	41,151	42,586	42,505

*Information provided by EPCOR
** Information provided by Bella Vista
All other information provided from District records

District Contract Detail
Table 1.3*

Water Source	Acre-Feet per Year	Contract No.	Notes
Reclamation Water Contract	41,000	14-06-W-204	The District has 8 PPR contracts.
Other MCWA Subcontract 2014-1	365	Bella Vista 2014-05	Expires 12/31/2019
MCWA Contract 2009	1,250	09-101 Amendment 1	None

*Source of information from District records.

There are no ground water basins, ground water recharge areas, or conjunctive use programs currently in place within the District's boundaries. All water is considered Colorado River water with the exception of a limited amount of reclaimed water. Reclaimed water use within the District has been steadily growing since 2000. However, the lack of M & I development, and thus influent to the wastewater treatment plants,

has limited the amount of reclaimed water available for re-use. The ability to deliver effluent to the potential customers has been difficult due to the associated infrastructure costs. The District continues to explore options that would reduce the infrastructure costs associated with these supplies to make this supply a more affordable alternative to potential customers.

The District itself does not own, operate, or maintain any wells. All wells within the District's boundaries are owned, operated, and maintained by non-District entities. These entities include utility companies, farmers, golf courses, and individually owned wells within the District. The owners of these facilities have their own operating and maintenance guidelines that they follow to ensure that their facilities are operating appropriately and not causing undo waste of a limited resource. The operations and maintenance of these facilities as well as the costs associated with the operation, maintenance, and capital improvements to these facilities are the responsibility of their respective owners.

A summary of the wells located within the District and owned by utility companies, amenity users, and agricultural users are included in the table below. The District also has approximately 1,547 individual exempt wells within the District's boundaries. This information obtained from ADWR is included as Appendix B.

Well Information
Table 1.4*

Name	MVIDD Well Site #	ADWR No.	(T, R & S)	Pumping Averages (gpm)
Camp Mohave (EPCOR)	Camp	55-559559	19N 22W 22	150
Lake Cimarron Primary (EPCOR)	Lake Cimarron	55-604160	18N 22W 23	190
Lake Cimarron Secondary (EPCOR)	Lake Cimarron	55-604161	18N 22W 23	225
King Street (EPCOR)	King Street	55-603947	18N 22W 21	300
Unit 17 Primary (EPCOR)	Unit 17	55-208170	18N 22W 27	500
Unit 17 Secondary (EPCOR)	Unit 17 Secondary	55-603949	18N 22W 27	300
Center Street (EPCOR)	Center	55-603946	18N 22W 21	100
Meadowlark (EPCOR)	Meadowlark	55-603948	18N 22W 21	300
Commercial Well (EPCOR)		55-603950	18N 22W 27	150
Unit 1 (EPCOR)	Unit 1	55-603951	18N 22W 35	250
Riding Club Well (EPCOR)	Riding Club Well	55-603952	18N 22W 35	200
Well 1 (Utilities, Inc.)	UI Well 1	55-527191	19N 22W 35	500
Well 2 (Utilities, Inc.)	UI Well 2	55-600335	19N 22W 26	500
Well 3 (Utilities, Inc.)	UI Well 3	55-600336	19N 22W 14	320
Well 4 (Utilities, Inc.)	UI Well 4	55-600337	19N 22W 23	250
Well 6 (Utilities, Inc.)	UI Well 6	55-806426	19N 22W 36	450

Well 7 (Utilities, Inc.)	UI Well 7	55-532342	19N 22W 35	450
Well 8 (Utilities, Inc.)	UI Well 8	55-565030	19N 22W 23	450
Well 9 (Utilities, Inc.)	UI Well 9	55-215355	19N 22W 14	450
Well 10 (Utilities, Inc.)	UI Well 10	55-215356	18N 22W 01	1000
Curcio (FMTUA)	Curcio	55-532195	17N 22W 23	325
St. George (FMTUA)	St. George	55-600333	17N 22W 15	140
Unit 7 (Lagoon Estates)	Unit 7	55-536722	17N 22W 01	1600
Unit 4 (Lagoon Estates)	Unit 4	55-618835	17N 22W 01	360
Unit 2 (Lagoon Estates)	Unit 2	55-618836	17N 22W 35	250
Unit 2 (Lagoon Estates)	Unit 2B	55-618837	17N 22W 35	250
Vanderslice	5	55-626083	17N 22W 13	2330
WPI II-COL	2	55-617490	17N 22W 13	2540
H. Kai	4	55-604351	17N 22W 13	3735
Vanderslice	3	55-626084	17N 22W 13	1360
H. Kai	8	55-604353	17N 22W 09	3816
WPI-Hancock Farm AZ	7	55-626969	17N 21W 07	3420
Becknell	9	55-908667	17N 21W 07	3285
Tropicana Ranch	10	55-605579	17N 21W 07	2300
WPI-CAD Farm AZ	43	55-918957	17N 22W 01	1500
WPI-CAD Farm AZ	44	55-918958	17N 22W 01	3500
Green Acres Mohave, LLC	12	55-086484	17N 22W 03	4295
Green Acres Mohave, LLC	11	55-086485	17N 22W 03	4345
Sherrill Ventures	14	55-627537	17N 22W 03	3750
Sherrill Ventures	13	55-627538	17N 22W 03	3750
WPI-R3 Farm AZ	6B	55-627535	17N 22W 11	4000
Sherrill Ventures	6A	55-627534	17N 22W 11	4000

Green Acres Mohave, LLC	15	55-086486	18N 21W 31	2875
WPI-TAC Farm AZ	19	55-604158	18N 22W 27	2500
WPI-TAC Farm AZ	45	55-920407	18N 22W 27	2000
J. Kai	16	55-809993	18N 22W 27	2500
WPI-Jerome Farm AZ	37	55-626965	18N 22W 13	3780
WPI- 919 Farm AZ	25B	55-222859	18N 22W 13	1965
WPI- 919 Farm AZ	25A	55-617628	18N 22W 13	2000
WPI- 919 Farm AZ	23	55-617630	18N 22W 25	1400
WPI- 919 Farm AZ	21	55-220500	18N 22W 25	1455
WPI- 919 Farm AZ	17	55-535885	18N 22W 25	3650
WPI- 919 Farm AZ	18	55-545571	18N 22W 25	3800
J. Kai	24	55-222707	18N 22W 23	3000
J. Perkins	40	55-617625	18N 22W 25	3030
Maverick Farms	39	55-503658	18N 22W 25	1500
WPI- 919 Farm AZ	22	55-220598	18N 22W 25	1800
WPI- Hulet Farm	33	55-915803	18N 22W 23	3430
WPI- Hulet Farm	32	55-801701	18N 22W 23	1650
Maverick Farms	38	55-621593	18N 22W 35	1000
Los Lagos	26	55-533096	18N 22W 01	1890
Marina Coves	1	55-204646	17N 22W 23	1000
Bella Vista	27	55-528553	18N 22W 01	1260
Bella Vista	28	55-920856	18N 22W 01	400
El Rio Golf		55-903680	18N 22W 11	2000
Willow Springs Golf	41	55-604159	18N 22W 27	50
Willow Valley Golf	42	55-581451	18N 22W 27	400
Evans	SU3	55-507325	9N 23W 18	650
Kelley	36	55-586605	17N 22W 09	199
Kelley	34	55-916516	17N 22W 09	116
Kelley	35	55-223050	17N 22W 09	125
Park	SU1	55-916738	18N 22W 35	285

*Source of information from five utility companies and individual well owners.

J. Water Uses

The District allows for uses of water not only for agricultural irrigation, but also for M & I purposes. M & I uses include amenity (golf courses and water amenities), commercial entities, industrial, residential subdivisions, and individual domestic users. The table below details the water usage by category and shows the largest crops produced in the District.

Water Uses 2018*
Table 1.5

	Type of Use	Acres	Percent of Water Used
Agricultural			77%
	Alfalfa	3528	
	Bermuda	524	
	Cotton	122	
	Other	20	
	Fallow	1389	
Sub-Total		5583	77%
M & I Amenity			
	Amenity		05%
	Other M & I		18%
Sub-Total			23%
Total			100%

* Source of information from District records.

The District climate includes high temperatures, windy conditions, and high TDS in the water supply. Due to the high winds and high temperatures, sprinklers have had varied success in the District. The challenges associated with using drip irrigation is the inability to leach salts that accumulate near the soil surface and root zone. Finally, conversion to sprinklers and/or drip irrigation is relatively expensive given the crops that are grown in the District. Thus, agricultural irrigation methods have been largely limited to flood irrigation. Farmers in the area have found this to be the most practical, reliable way to irrigate crops.

Water Uses 2000 to 2018*
Table 1.6

Water Uses	2000 Acre-Feet	2005 Acre-Feet	2013 Acre-Feet	2018 Acre-Feet	Forecasted 2019 Acre-Feet
Agricultural	32,815	25,808	18,877	31,356	32,142
Amenity	1,526	1,733	2,937	1,907	1,974
Other M & I	3,121	4,716	3,753	4,092	5,360
Recharge	0	0	0	0	0
Total	37,462	32,257	25,567	37,355	39,746

*Source of information from District records.

2013 was an abnormally low year for water use due to a number of farms in the District that were for sale. These farms were acquired and brought back into production beginning in 2013 and 2014. As of this report, most of the farmland in the District is now in production.

K. Storage

The District does not own, operate, or maintain any storage facilities itself. There are no tail-water recovery systems, recharge areas, or regulating reservoirs within the District. All storage facilities within the District's boundaries are owned and operated by non-District entities. The operations and maintenance of these facilities as well as the costs associated with the operation, maintenance, and capital improvements to these facilities are the responsibility of the landowners.

A summary of the storage facilities located within the District and owned by utility companies and amenity users are included in the table below.

Storage Facilities*
Table 1.7

Name	Type	(T, R, & S)	Capacity
Camp Mohave (EPCOR)	Reservoir	19N 22W 22	250,000
Lake Cimarron (EPCOR)	Reservoir	18N 22W 23	196,000
King Street (EPCOR)	Reservoir	18N 22W 27	163,000
King Street (EPCOR)	Reservoir	18N 22W 27	47,000
King Street (EPCOR)	Reservoir	18N 22W 21	96,000
El Rodeo 1 (Utilities, Inc.)	Reservoir	19N 21W 30	500,000
El Rodeo 2 (Utilities, Inc.)	Reservoir	19N 21W 30	500,000
El Rodeo 3 (Utilities, Inc.)	Reservoir	19N 21W 30	500,000
El Rodeo 4 (Utilities, Inc.)	Reservoir	19N 21W 30	500,000
Arroyo Vista 1 (Utilities, Inc.)	Reservoir	19N 21W 07	372,000
Arroyo Vista 2 (Utilities, Inc.)	Reservoir	19N 21W 07	372,000
FMTUA	Curcio	17N 22W 23	50,000
Bella Vista	Lake System	18N 22W 01	92,324,000
Marina Coves	Lake System	17N 22W 23	40,000,000

* Information provided by the five utility companies, Bella Vista and Marina Coves.

L. Distribution Facilities

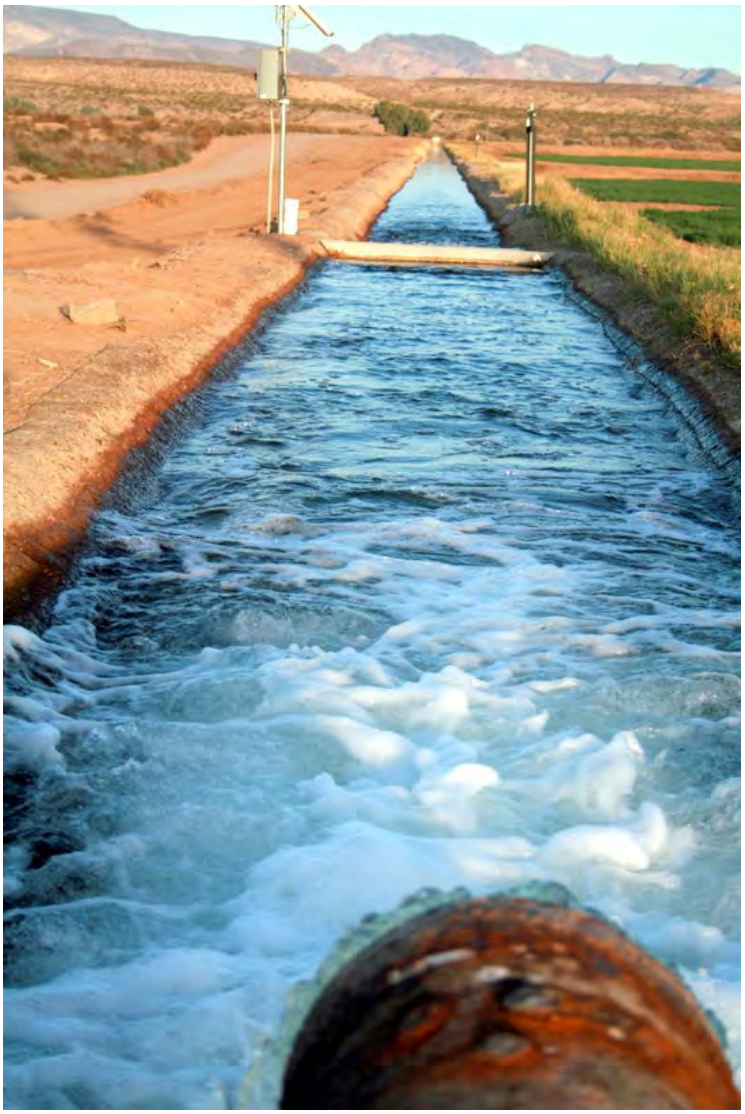
The District itself does not own, operate, or maintain any distribution facilities. All distribution facilities within the District's boundaries are owned and operated by non-District entities. The operations and maintenance of these facilities as well as the costs associated with the operation, maintenance, and capital improvements to these facilities are the responsibility of the landowners. These landowners have developed their own maintenance schedules to ensure that their facilities are operating appropriately and properly managing the available water supplies. Distribution facilities within the district include pipes, valves, and accessory facilities owned and operated by utility companies located within the District. They also include ditches, gates, and accessory facilities owned and operated by agricultural landowners within the District.

M. Drainage Facilities

The District does not own, operate, or maintain any drainage facilities. There are no drainage facilities (surface or sub-surface) that are located within the District's boundaries. Therefore, the District does not measure or sample water draining from the District. The District recognizes that there are return flows from the District to the Colorado River, but does not receive any credit for those flows. The District's diversion and beneficial use of Colorado River water is monitored by the Bureau of Reclamation and consumptive use is projected each year.

N. Water Measurement and Accounting Procedures

The District is responsible for the overall water measurement and accounting procedures associated with the service area. However, the 5 utility companies located within the District's boundaries are also under the jurisdiction of the Arizona Corporation Commission. The accounting procedures of each utility company are the responsibility of the individual utility company. The utility companies' meter and bill their customers in accordance with their own policies and procedures. The District, in accordance with the Bureau of Reclamation (BOR) master contract, monitors water usage on a monthly basis, including usage by the utility companies. This information is provided to the BOR on a monthly basis.



The water users including, agricultural, amenity, industrial and utility providers submit reports specifying the amount of water pumped from their respective wells during the previous month to the District on a monthly basis. The District also calculates the amount of water used by non-metered, exempt wells within the District. All this data is then compiled into a single report that is transmitted to the BOR on a monthly basis.

The District also monitors the amount of water allocated within its service area. This water inventory shows the following allocations by classification.

Water Allocations*
Table 1.8

Type	Percent
Agricultural	**77.31%**
Amenity	**4.68%**
Commercial	**2.26%**
Individual	**1.14%**
Municipal	**0.14%**
Subdivisions	**14.33%**

*Source of information from District water inventory as of November 30, 2018.

The amenity classification above includes 3 golf courses and 2 amenity lakes. The District Policy 2009-02 passed on May 5, 2009, stipulates the District shall only allocate water to lands for permitted beneficial use and therefore believes that effluent should be the source of water for amenity users. The 3 golf courses and 2 amenity lakes currently have a water entitlement contract with the District through December 31, 2026. The District will no longer permit additional golf courses or amenity lakes to be developed using fresh water.

The District currently has 1,594 direct customers. This total includes 36 agricultural customers, 5 amenity customers, 5 utility companies (the 5 utility companies provide service to 12,273 customers), 1 customer classified as industrial, and approximately 1,547 exempt-well customers. The 36 agricultural customers have a water measurement system that has been approved by the Bureau of Reclamation and we are in the process of improving with a more reliable metering system. The 5 amenity

customers are metered with MAG meters and the 5 utility customers meter their wells and customers themselves. The 1 industrial customer and the approximately 1,547 exempt-well customers are not metered. The 1 industrial customer estimates their usage by the amount of time the well operates. The approximately 1,547 exempt-well customers' water usage is calculated by staff. The staff prepared a number of potential alternatives to calculating the exempt-well usage. The final analysis approved by the board was 375 gallons per day per household. This number coincides with ADWR guidelines for single-family residences water allocation.

Customers*
Table 1.9

Entity	Type	Number	Accuracy (percent)	Reading	Calibration	Maintenance
EPCOR- CM	5/8 x 3/4	57	100	Monthly	Upon request	Replace every 15 yrs.
EPCOR-CM	1	11	100	Monthly	Upon request	Replace every 15 yrs.
EPCOR-CM	1.5	2	100	Monthly	Upon request	Replace every 15 yrs.
EPCOR-CM	2	12	100	Monthly	Upon request	Replace every 15 yrs.
EPCOR-RVR	5/8	128	100	Monthly	Upon request	Replace every 15 yrs.
EPCOR-RVR	1	5	100	Monthly	Upon request	Replace every 15 yrs.
EPCOR–Unit 17 WV	¾	5	100	Monthly	Upon request	Replace every 15 yrs.
EPCOR-Unit 17 WV	5/8	1447	100	Monthly	Upon request	Upon request/ Every 10 yrs.
EPCOR–Unit 17 WV	1	9	100	Monthly	Upon request	Upon request/ Every 10 yrs.
EPCOR-Unit 17 WV	1 ½	3	100	Monthly	Upon request	Upon request/ Every 5 yrs.
EPCOR-Unit 17 WV	2	4	100	Monthly	Upon request	Upon request/ Every 5 yrs.
EPCOR-Unit 17 WV	¾	4	100	Monthly	Upon request	Upon request/ Every 5 yrs.
EPCOR-Unit 17 WV	4	1	100	Monthly	Upon request	Upon request/ Every 5 yrs.
EPCOR-Unit 17 WV	6	3	100	Monthly	Upon request	Upon request/ Every 5 yrs.
EPCOR-Cimarron	¾	1	100	Monthly	Upon request	
EPCOR-Cimarron	5/8	142	100	Monthly	Upon request	
EPCOR-Cimarron	2	3	100	Monthly	Upon request	
Sunrise Vista	¾ x 5/8	664	100	Monthly	Upon request	Upon request/ Every 10 yrs.

Sunrise Vista	1	3	100	Monthly	Upon request	Upon request/ Every 10 yrs.
Sunrise Vista	2	1	100	Monthly	Upon request	Upon Request / Every 10 yrs.
Utilities, Inc.	¾ x 5/8	6848	100	Monthly	Upon request	Upon request/ Every 20 yrs.
Utilities, Inc.	1	230	100	Monthly	Upon request	Upon request/ Every 20 yrs.
Utilities, Inc.	1.5	0	100	Monthly	Upon request	Upon request/ Every 20 yrs.
Utilities, Inc.	2	62	100	Monthly	Upon request	Upon request/ Every 10 yrs.
Utilities, Inc.	4 compound	2	100	Monthly	Upon request	Upon request/ Every 7 yrs.
Utilities, Inc.	6 compound	4	100	Monthly	Upon request	Upon request/ Every 5 yrs.
Lagoon Estates	3/4 x 5/8	362	100	Monthly	Upon request	Upon request/ Every 1.0 million gal.
Lagoon Estates	1	2	100	Monthly	Upon request	Upon request/ Every 1.0 million gal.
Lagoon Estates	2	11	100	Monthly	Upon request	Upon request/ Every 1.0 million gal.
Lagoon Estates	8	1	100	Monthly	Upon request	Upon request
FMTUA	¾ x 5/8	2,129	100	Monthly	Upon request	Upon request
FMTUA	¾ x ¾	0	100	Monthly	Upon request	Upon request
FMTUA	1	96	100	Monthly	Upon request	Upon request
FMTUA	1 ½	7	100	Monthly	Upon request	Upon request
FMTUA	2	0	100	Monthly	Upon request	Upon request
FMTUA	3	6	100	Monthly	Upon request	Upon request
FMTUA	4	6	100	Monthly	Upon request	Upon request
FMTUA	6	2	100	Monthly	Upon request	Upon request
MVIDD	Hour Meters	34	varies	Monthly	Upon request	Upon request

*Customer data provided by the five utility companies and District for the year ending 2018.

O. Water Pricing and Billing Practices

The District reviews and may adjust fees on an annual basis. This is completed as part of the budget process in the second quarter of the calendar year. The District may adjust fees other than annually, if necessary.

The District's fees **do not** include costs associated with the operation and maintenance of water production, storage, distribution, drainage, or recharge facilities. These facilities are owned, operated, and maintained by the landowners within the District. Costs such as electrical, chemicals, well and ditch maintenance, storage facility maintenance, distribution system maintenance, and capital improvement costs are born directly by the landowners and users within the District. The District pays none of these costs and as such they are **not** included in the rates and fees charged by the District.

Mohave Valley Irrigation and Drainage District Comprehensive Fee Schedule

Application Fees

Application Fee Non- Agricultural (Residential, Commercial) (Plus Allocation Fee)	$200.00	
New Agricultural, Amenity or Industrial Application (Plus per acre foot fee (1))	$1,000.00	
Contract Transfer (Plus per acre foot fee (2))	$750.00	
Interim ABU Water (Plus per acre foot fee (3))	$1,000.00	

Allocation Fees

Residential Lot		
Preliminary Allocation	$500.00	per lot
Final Allocation	$214.00	per lot
Apartment / Town Home		
Preliminary Allocation	$600.00	per unit
Final Allocation	$300.00	per unit
RV Park Space		
Preliminary Allocation	$300.00	per space

Final Allocation	$150.00	per space
RV Park Commercial		
Preliminary Allocation	$1,200.00	per acre foot
Final Allocation	$900.00	per acre foot
Commercial		
Preliminary Allocation	$1,200.00	per acre foot
Final Allocation	$900.00	per acre foot
Six (6) Month Temporary Allocation	$50.00	per acre foot
(1) New Contract Fee	$20.00	per acre foot
(2) Contract Transfer Fee	$15.00	per acre foot
(3) Interim Water Agricultural Entitlement Fee	$8.00	per acre foot per year
(3) Interim Water ABU Entitlement Fee	$100.00	per acre foot per year

Tax District Levy

$1.50 per acre per year

Allocation Administration Fees

Agricultural Water Entitlement Fee	$4.00	per acre foot per year
PPR Administration Fee	$1.00	per acre foot per year
Agricultural Water Supplement Fee	$8.00	per acre foot per year
Interim Water Amenity Entitlement Fee	$50.00	per acre foot per year
Industrial Water Entitlement Fee	$50.00	per acre foot per year
Supplemental Interim Water Entitlement Fee	$50.00	Per acre foot per year
Water Utility administration Fee	$4.00	per acre foot per year
Intergov Agreement Administrative Fee	$1,900.00	Plus $1 per acre foot per year
Water Allocation Extension Administration Fee	$250.00	Per extension
NSF Check Fee	$35.00	
Late Payment Fee	10%	of the amount unpaid
Late Reporting Fee	$100.00	For each month reported late
Water Order Deviation Penalty Fee	10%	of the amount above or below 10% of the amount ordered

Effective July 1, 2018

Mohave Valley Irrigation and Drainage District
Payment Rules

1) All application fees are due and payable with the application.
2) All fees are non-refundable.
3) Final allocations for residential and commercial subdivisions, will be approved upon final plat approval by the Mohave County Board of Supervisors.
4) Final Allocations for commercial and industrial developments, will be approved upon final site plan approval by the Mohave County Board of Supervisors.
5) All water entitlement contract holders shall be assessed the Water Entitlement Fee.
6) PPR holders must pay an administrative fee for the administration of the PPR water.
7) The PPR Administration Fee is charged on the proportionate share of the PPR Water.
8) PPR Administration Fees are payable in arrears.
9) PPR Administration Fees will be billed on or before January 31 for the preceding calendar year.
10) PPR Administration Fees are due by March 31.
11) Agricultural Water Entitlement Fees shall be paid on the entire amount of water allocation under contract.
12) Agricultural Water Entitlement fees are payable in arrears.
13) Agricultural Water Entitlement fees will be billed on or before January 31 for the preceding calendar year.
14) Agricultural Water Entitlement fees are due by March 31.
15) A 10% late fee will be assessed on all late payments. This fee will be assessed monthly until the bill is paid in full.
16) No application will be accepted from parties who have an outstanding balance owed to the district.
17) If a check is returned to the District as NSF, the party will be required to provide the District with a cashier's check as a replacement.
18) Allocation fees for a phased development may at the sole discretion of the District be transferred from one phase of a project to another within the same project. (Fees may not be transferred to a different project)
19) The District may make "Interim Water ABU" available for use on an annual basis. This Interim Water ABU may be contracted for on an annual basis until December 31, 2025. These annual contracts are not renewable. A

contract holder who wishes to extend their water use will be required to sign a new contract each year at the expiration of the expiring contract.

20) Interim Water ABU orders must be submitted on or before May 15 of the year preceding the anticipated use. For example: water needed for the calendar year 2018 should be ordered by May 15, 2017. Orders placed after the due date will be placed at the bottom of the priority list and may not receive water as ordered.
21) Interim Water ABU is the lowest priority water within the District. Therefore, it will be the first water reduced should the District be required to reduce the amount of water it has available.
22) The Interim Water ABU users are billed in advance.
23) Interim Water ABU Entitlement Fees will be billed on or before January 1 for the calendar year of use.
24) Interim Water ABU Fees are charged and payable on the entire amount of water ordered. No credit is given for unused amounts. The user is charged for the amount of water reserved for their use.
25) Interim Water ABU used in excess of the amount ordered will be billed the Interim Water ABU Entitlement Rate plus the Supplemental Interim Water Entitlement Fee.
26) Interim Water ABU Entitlement fees are due by March 31.
27) Interim Water ABU is a temporary alternative source of water and is not intended to replace or become a permanent source of supply.
28) Interim Water Amenity orders must be submitted on or before May 15 of the year preceding the anticipated use. For Example: water needed for the calendar year 2018 should be ordered by May 15, 2017. Orders placed after the due date will be placed at the bottom of the priority list and may not receive water as ordered.
29) All Interim Water Amenity water users are billed in advance.
30) Interim Water Amenity Entitlement fees will be billed on or before January 31 for the calendar year of use.
31) Interim Water Amenity Fees are charged and payable on the entire amount of water under contract. No credit is given for unused amounts. The user is charged for the amount of water reserved for their use.
32) Interim Water Amenity water used in excess of the amount under contract will be billed the Interim Water Amenity Entitlement Rate plus the Supplemental Interim Water Entitlement Fee.
33) Interim Water Amenity Entitlement Fees are due by March 31.
34) Industrial Water orders must be submitted on or before May 15 of the year preceding the anticipated use. For example: water needed for the calendar year 2018 should be ordered by May 15, 2017. Orders placed after the due date will be placed at the bottom of the priority list and may not receive water as ordered.
35) Industrial Water Entitlement Fees shall be paid on the entire amount of water allocation under contract.
36) Industrial Water Entitlement fees are payable in advance.
37) Industrial Water Entitlement fees will be billed on or before January 1 for the calendar year of use.

38) Industrial Water used in excess of the amount under contract will be billed the Industrial Water Entitlement Rate plus the Supplemental Interim Water Entitlement Fee.
39) Industrial Water Entitlement fees are due by March 31.
40) A 10% late fee will be assessed on all late payments. This fee will be assessed monthly until the bill is paid in full.
41) Utility Companies shall be billed in arrears.
42) Utility Companies providing service within the District will be charged an administrative reporting fee for administration of the entitlements they deliver.
43) Amenity users that are parties to an Intergovernmental agreement shall be charged an administrative fee due and payable in advance.
44) Entities requesting a water allocation extension shall pay an extension fee prior to the extension being granted.
45) Contract holders shall provide the District with a water order on or before May 15 of the year preceding the anticipated use. For example: water needed for the calendar year 2018 should be ordered by May 15, 2017.
46) If a water order is not received from a water contract holder by May 15, the contract holder will be deemed to have ordered their full contract amount.
47) A water deviation fee shall be assessed on all orders that are more than 10% different than the amount ordered. For example: if 1,000 AF of water is ordered. There would be a penalty charged on amounts above 1,100 AF or below 900 AF of water actually used.
48) All water users are required to provide monthly water use reports in a form acceptable to the District.
49) All water users are required to provide the monthly water use information by the 10th of the month following its use. If the 10th falls on a holiday or weekend the information is due the day before the holiday or weekend. This information is required to be in the District office by the 10th or it is considered late.
50) A Late Reporting Fee will be charged to users that do not provide their monthly water usage information by the 10th (information is required to be in the District office by the 10th or it is considered late) of the month following its use.

Effective July 1, 2018

The District reviews and updates its fee schedule on an annual basis as part of its budget process.

P. Water Shortage Allocation Policies

Since the District was formed in 1963, it has never had an instance where it was unable to provide the amount of water requested from a contract holder. Thus, there was a high probability that the District would be able to continue to deliver water as ordered. However, with the increased probability of reduced snowpack/runoff in the Colorado River Basin, this may become a problem in the future. Given the increased probability of an initial water shortage declaration on the Colorado River, the District believes it is now necessary to establish a policy for water shortage sharing within the District.

The District is currently working on a Water Shortage Resolution. The Resolution is anticipated to state that if the District's water supply is curtailed, then the first water users that will be impacted are those holding Interim Water Contracts. If the District must reduce water deliveries further, then Agricultural and Amenity Water Contracts will be impacted. The Agricultural and Amenity Water Contracts will share proportionately in any reduction required thru December 31, 2026. After December 31, 2026 the Amenity Contracts expire. The amenity users will then fall within the Interim Water Contracts category and/or begin using a new supply such as effluent. In either case, these amenity users' water allocation will be reduced to zero before any agricultural user reduction post 2026. The District is still working on the final details of the proposed resolution.

Q. Operations and Maintenance Program

The District does not own, operate, or maintain any wells, storage facilities, distribution facilities, drainage facilities, tail-water recovery systems, recharge areas, or regulating reservoirs. All the aforementioned facilities that are present within the boundaries of the District are owned and operated by others. These include utility companies, farmers, golf courses, and individuals. The operations and maintenance of these facilities as well as the costs associated with the operation, maintenance, and capital improvements to these facilities are the responsibility of their respective owners. These owners have developed their own maintenance schedules to ensure that their facilities are operating appropriately and not causing undo waste of a limited resource.

The District does inspect meter installations and irrigation ditches to confirm compliance with District Policies. The District recently adopted Resolution 2019-01 to promote efficiency in irrigation and water conservation. The policy requires installation of water flow meters on all points of agricultural diversions. The District recognizes the importance for the most accurate water reporting within its boundaries.

District Policies

a. Water Allocation Policy – The District has water allocation policies for residential and commercial subdivisions, commercial and industrial projects, agricultural and individual parcels. The policies include the water allocation guidelines for timelines and amounts. See Appendix C for Resolution Number 2014-04.

b. Water Order – The agricultural, amenity, and industrial users in the District are required to provide their water orders for the succeeding year to the District by May 15 of the current year. District staff calculates the water needs for the utility customers as well as the exempt-well users. The water orders are then consolidated to create a water order. The water order is then sent to the BOR.

c. Water Shut-Off Requests – The District does not own or operate any wells, storage, or distribution facilities. The individual users own, operate, and maintain their own facilities. Since these facilities are owned and operated by the users, and they determine the timing of the operation of the facilities, there are no water shut-offs by the District.

d. Return Flow Policy – The District does not have a policy regarding return flows. The District does not receive credit for return flows.

e. Water Transfers – The District has a Water Transfer Policy in place, which allows for the transfer of water from one user to another within the District. This transfer could be used in the case of a new owner acquiring a parcel of land with an existing water entitlement. It could also allow for a user that desires to transfer all or a portion of the water entitlement to another landowner within the District. In July of 2018, the District passed Resolution 2018-04 to make water available outside District boundaries for a defined program period through a rotational land fallowing program approved by the District, the State of Arizona and the United States Department of the Interior. See Appendix D for Resolution Number 07-05 and 2018-04.

Step 2 – Inventory Water Resources

A. Water Budget Tables

a. District Water Supplies - The water resources for the District include surface water, reclaimed water, and a small amount of precipitation as detailed in the table below.

Monthly District Water Supply Data for 2018
Table 2.0

Month	Surface Water (Colorado River) (acre-feet) *	Ground Water	Reclaimed Water ** (acre-feet)	Precipitation ***	Total (acre-feet)
January	2,284	0	22	0.41	661
February	2,711	0	20	0.20	1,767
March	3,070	0	16	0.23	2,695
April	3,326	0	20	0.00	3,935
May	3,673	0	20	0.00	4,048
June	4,052	0	20	0.00	4,423
July	4,194	0	23	0.93	4,554
August	4,244	0	23	0.17	5,648
September	3,989	0	20	0.00	3,756
October	3,130	0	22	0.29	2,504
November	2,713	0	22	0.04	2,597
December	2,361	0	21	0.41	767
Total	39,746	0	255	2.97	37,355

*This is the amount of water ordered from the BOR for the calendar year 2019
** Reclaimed water used from EPCOR reported by Bella Vista for 2018.
***Precipitation is not included in the total water supplies for the District. Data for 2018 from Needles, Ca Airport (KEED) https://www.wunderground.com/history/airportfrompws/KEED/2018/1/1/CustomHistory.html?dayend=31&monthend=12&yearend=2018&req_city=&req_state=&req_statename=&reqdb.zip=&reqdb.magic=&reqdb.wmo=

The table above shows that over 99% of the water supply for the District comes from its Colorado River water contracts. A minimal amount of water comes from reclaimed water.

b. District Water Uses – The District does not own, operate, or maintain any wells, distribution or storage facilities. The users own and operate their own facilities. The District has no water uses for canal seepage, evaporation, spills, or riparian uses in canals since the District does not own or operate any of these facilities. There are agricultural and M & I water uses within the District. There are a number of developments and commercial projects within the District's boundaries. Many of these developments are only partially completed. However, in accordance with ADWR Water Adequacy Policy once the property has a final plat, the water allocated to the development cannot be re-allocated for another use unless the final plat is abandoned. The District does have the ability to use the unused water on an interim basis until it is needed by the development. There are approximately 9,000 vacant lots within MVIDD with a permanent water entitlement, totaling 3,060-acre feet of water that is reserved for the District's long-term population growth. This is enough water to accommodate an additional 22,500 more people. *See The Future of Water Management presentation in Appendix F.

Monthly District Water Usage Data for 2018
Table 2.1

Month	Agricultural (acre-feet) *	M & I (acre-feet) *	Ground Water Recharge	Water Exchange or Transfer	Reclaimed Water (acre-feet) **	Total (acre-feet)
January	303	358	0	0	22	661
February	1,395	373	0	0	20	1,767
March	2,284	410	0	0	22	2,695
April	3,479	455	0	0	20	3,935
May	3,500	547	0	0	20	4,048
June	3,849	574	0	0	20	4,423
July	3,941	613	0	0	23	4,554
August	5,011	638	0	0	23	5,648
September	3,134	622	0	0	20	3,756
October	2,010	495	0	0	22	2,504
November	2,148	449	0	0	22	2,597
December	373	394	0	0	21	767
Total	31,427	5,928	0	0	255	37,355

*Actual water pumped and reported to the BOR in 2018.
**Reclaimed water used from EPCOR reported by Bella Vista.

B. Quality of Water Sources

There is no water quality testing covering the entire District completed on a regular basis, except for those areas that the 5 utility companies serve within the District. The five utility companies are required by the Arizona Department of Environmental Quality (ADEQ) to sample their water systems on a regular basis and to report the results of the sampling to their customers annually.

Copies of the 2013 through 2018 Consumer Confidence Reports (C.C.R.) from the utility companies (Utilities, Inc., EPCOR, Sunrise Vista, Lagoon Estates, and FMTUA) are attached for reference in Appendix E.

The water quality reports from the various utility companies indicate that water quality issues are primarily point-source pollution caused by seepage from septic systems and naturally occurring arsenic.

C. Water Uses within the District

The District allows M & I development within the District's external boundaries. Many irrigation districts restrict water uses within their district boundaries to agricultural uses only.

Water Uses, Major Crops and Acreage For 2018
Table 2.2

Customer Type	Number of Customers	Crop	Acres	Water Used (acre-feet)
Agricultural	36	Alfalfa / Hay	3528	31,356
		Cotton	122	
		Vegetables	9	
		Hay/Bermuda	530	
M & I (Utilities, Inc.)	7,144			2,438
M & I (Sunrise Vista)	668			215
M & I (EPCOR) CM & RVR	215			**EPCOR Total
M & I (EPCOR) WV & Cimarron	1,617			**324
M & I (Lagoon Estates)	379			95
M & I (FMTUA)	2,246			307
Other M & I (Exempt Wells)	1,547			641
Amenity	5			1,907
Other	3			71
Ground Water Recharge	0			0
Total	13,860			37,355

*Source for M & I use provided by the five utility companies. Other M & I include exempt wells within District.

D. Quantity and Quality of Drainage from the District

The District does not have a policy regarding return flows. The District does not receive credit for return flows.

Step 3 – Water Management Problems, Opportunities, and Conservation Goals

A. Describe the District's Water Management Problems and Challenges

1) While the District manages the water entitlements within its boundaries, it has had some difficulty with the coordination of that process with Mohave County. Mohave County does not include the District in their planning and permitting processes for individual lots located outside of subdivisions. The District is working to improve communications with Mohave County Development Services so that it may be notified when proposed projects are under review. This would enable the District to ensure that the proposed project has a Colorado River water entitlement for its proposed diversion.

2) The District continues to have no control over the drilling of wells within its boundaries. However, ADWR is now notifying the District when an Intent to Drill is submitted. It is estimated that there are over 1,547 exempt wells located within the District. As time goes on, this number could increase. The District continues to request that the landowners register their wells.

   The District passed resolution 93-02, which requires prior approval of wells drilled within the District, but this resolution has not been recognized by ADWR. The District also passed resolution 2009-10 which requires the registration of wells with the District. This has also not been recognized by ADWR.

3) The District's water entitlement is nearly fully allocated. In addition to the remaining water set aside for new M&I projects, the District has water allocated to platted but unbuilt subdivisions, totaling approximately 9,000 lots. Homes built on these lots will provide housing for approximately 22,500 new people. Beyond these supplies that are dedicated to accommodate possible population growth, the District plans to accommodate long-term growth through the market based transfer of water from Agricultural to Urban uses. *See The Future of Water Management Presentation in Appendix F.

4) The District passed resolution 2018-04 so that the District may undertake to develop a Rotational Land Fallowing Program designed to make water available outside District boundaries for a defined program period, but not in perpetuity. The District's Board of Directors believe that such a

Rotational Land Fallowing Program would, if properly structured and implemented, provide significant benefits to the agricultural landowners within the District while avoiding adverse impacts.

B. Describe the District's Water Management Goals

1) To continue to work with Mohave County Planning and Zoning as well as Development Services to allow any District's concerns to be addressed before the county approves a project for individual lots located outside of subdivisions within the District's boundaries.

2) To continue to work with ADWR to be notified when a new well is being drilled or modified in our District boundaries. This would help ensure that wells drilled in the state have a legal right to the water that they are pumping and the District can account for the water usage.

3) To continue to work with ADWR and the Bureau of Reclamation on the District's participation in the EC ICS Lower Basin Drought Contingency Plan, which enables the District's agricultural landowners to store water in Lake Mead and earn a storage credit that may be delivered at a later date or preserved in storage for system-wide benefit.

4) To work with the Agricultural water entitlement holders to replace old discharge pipes and install District approved flow meters for more accurate reporting of water use on farms.

Step 4 – Existing Water Conservation Measures
A. List of the Practices and Expected Results That Were Identified and Implemented Previously

Practice	Expected Results
Complete an updated water inventory	This would result in more accurate accounting of the District's allocated water. This inventory will be based on the parcel list provided by Mohave County Assessor's office. This will take 6-12 months to complete.
Continue to work with Mohave County P & Z on development projects in our District boundaries.	This would allow the District to advise the Planning and Zoning departments of any issues in regards to water allocations approved for or not yet applied for. This would more accurately account for allocated water.
Water Conservation Programs	With participation in rotational fallow programs, the District's agricultural landowners will be able to store water in Lake Mead. Drought Contingency Plan for EC ICS.
Continually develop more accurate means of water measurement	Through the replacement of old discharge pipes on each diversion site, better water measurement deliveries can be tracked. 50/50 Grant Opportunity with the BOR.
Compensated Water Conservation on Farms	Farmers could possibly participate in voluntary, compensated water conservation such as rotational fallowing programs. The economic incentives associated with these programs are likely to drive water conservation.

B. Description of the Actual Program Design and Results of Practices That Were Implemented

Program Design	Results
River Water Pump Station: The water metering program that District was planning on implementing for the River Water Pump Station.	The District applied for a grant for the preliminary engineering of a River Water Pump Station, however, due to a lack of interest of the land owner where the site location would be, this project did not move forward.
Well Inventory: The District did develop a well inventory in the anticipated implementation schedule previously set.	The District created a well inventory for all of the AG, Utility, and Amenity wells located in the District. On a yearly basis only the AG wells were flow tested and monitored by the District. This well inventory helps the District maintain a more accurate flow rate of the water used for farming and helps in the accurate report of the water use. The AG water use accounts for 77% of the current water allocation in the District.

Step 5 – Fundamental Water Conservation Measures

A. Water Measurement and Accounting System Design to Measure and Account for the Water Conveyed through the District Distribution System to Water Users

Describe the District's Current Measurement and Accounting System– The District itself does not own, operate, or maintain any wells. All wells within the District's boundaries are owned and operated by non-District entities. These entities provide their own personnel to operate and maintain their facilities.

The District itself does not own, operate, or maintain any distribution facilities. All distribution facilities within the District's boundaries are owned and operated by non-District entities. These entities provide their own personnel to operate and maintain their facilities. These owners have developed their own maintenance schedules to ensure that their facilities are operating appropriately. Distribution facilities within the district include pipes, valves, and accessory facilities owned and operated by utility companies located within the District. They also include ditches, gates, and accessory facilities owned and operated by agricultural entities within the District.

The District is responsible for the overall water measurement and accounting procedures associated with the service area. However, the 5 utility companies located within the District's boundaries are also under the jurisdiction of the Arizona Corporation Commission. The accounting procedures of each utility company are the responsibility of the individual utility company. The utility companies' meter and bill their customers in accordance with their own policies and procedures. The District in accordance with the Bureau of Reclamation (BOR) Master Contract monitors water usage on a monthly basis, including usage by the utility companies. This information is provided to the BOR on a monthly basis.

The water users including, agricultural, amenity, industrial and utility providers submit reports specifying the amount of water pumped from their respective wells during the previous month to the District on a monthly basis. The District also calculates the amount of water used by non-metered, exempt wells within the District. All this data is then compiled into a single report that is transmitted to the BOR on a monthly basis.

The District, through a cost sharing grant with the BOR, undertook an hour meter installation program and the purchase of new flow testing equipment in 2015 for the agricultural users within the District. This program required that all agricultural users install hour meter devices on their wells and District staff tested the water flow and TDS on a yearly basis. This program was intended to increase the accuracy of the water accounting and flow rates within the District. This program was approved by the BOR and has improved the District's water accounting accuracy.

However, there have been some issues with older discharge pipes and the ability to get an accurate, reliable reading on some of the agricultural wells. The District is therefore seeking a cost sharing grant with the BOR for a Discharge Pipe replacement program and passed Resolution 2019-01 requiring all AG entitlement users to install new water flow meters on all AG wells in the District. In addition, the District is willing to assist in this requirement by reimbursing up to a 50% cost share for installation of new District approved flow meters. Our goal is to promote efficiency in irrigation, water conservation and for water reporting accuracy for all irrigation water contract entitlement holders within the District.

B. A Water Pricing Structure That Encourages Efficiency Improvements by Water Users

Describe the District's Current Pricing Structure and How it Promotes Efficiency –

The District is responsible for the overall water measurement and accounting procedures associated with the service area. However, the 5 utility companies located within the District's boundaries are also under the jurisdiction of the Arizona Corporation Commission (ACC). The accounting procedures of each utility company are the responsibility of the individual utility company. The rates charged by the utility companies are set by the ACC. The ACC considers water conservation objectives as one of the criteria used in setting rates. Utility companies' meter and bill their customers in accordance with their own policies and procedures. Thus, the District has no control over the rates and fees charged by the utility companies.

The District does have control over the fees charged by it to users within the District. The District has taxing authority. The District taxes lands within the District at a rate of $1.50 per acre in 2018. Each amenity user has an entitlement that specifies the rate they are charged on a per acre-foot of water basis. This price of $75.00 per acre-foot of water per year begins in 2020. The amenity users are charged for the full amount of water they order in a given year, not to exceed their contract amount. Additional fees are imposed at the rate of $125.00 an acre foot for deviating over their contract. Agricultural users pay per acre-foot of water included in their entitlement and not based on fluctuations in actual use. This Allocation Administration Fee charged to agricultural customers is designed to cover costs associated with operating the District.

The District is encouraging water use efficiency from farmers by promoting Land Fallowing Programs such as the EC ICS Lower Basin Drought Contingency Plan and/or other such conservation programs approved by the District, the State of Arizona and the United States Department of the Interior per District resolution 2018-04 approved in July of 2018.

C. An Information and Education Program for Users Designed to Promote Increased Efficiency of Water Use

Describe the District's Current Information and Education Program - The District does not currently have an education program in place. However, the various utility companies are involved in education outreach to their respective customers (including schools) as well as provide information on their websites. The District plans on developing an educational pamphlet designed to work with local realtors, Mohave County, ADWR and the general public to understand the importance of checking with the District to verify if an allocation has been approved for their parcel of land. This education pamphlet would help promote community awareness on the need to have a legal right to divert and use water within the District.

The agricultural customers are professionals in their field and have been improving their conservation efforts. These efforts include lining ditches, placing metering devices on their wells, and laser-leveling fields. These users keep in contact with National Resources Conservation Service (NRCS) as well as others for their needs.

D. Water Conservation Coordinator

The General Manager for MVIDD will serve as the Water Conservation Coordinator.

Name:	Kerri Hatz
Title:	General Manager
Phone:	(928) 768-3325
Fax:	(928) 768-5239
Email:	office@mvidd.net

Step 6 – Additional Water Conservation Measures
A. Agricultural Water Conservation Measures

1 – On-Farm Program Incentives – The District currently has no on-farm incentive programs in place, but is actively pursuing the development of a fallowing program that could help create incentives for conserving water (see below).

2 – Drought / Water Shortage Contingency Plan – The District recently joined efforts with the Bureau of Reclamation and ADWR to support and possibly participate in the Lower Basin Drought Contingency Operations Intentionally Created Surplus program (LB DCP). This is designed to help sustain the entire Colorado River System. The District continues to look at different ideas for an approved fallowing program.

3 – Water Transfers – The District has a Water Transfer Policy in place, which allows for the transfer of water from one user to another within the District. This transfer could be used in the case of a new owner acquiring a parcel of land with an existing water entitlement. It could also allow for a user that desires to transfer all or a portion of the water entitlement to another landowner within the District. In July of 2018, the District passed Resolution 2018-04 to make water available outside District boundaries for a defined program period through a rotational land fallowing program approved by the District, the State of Arizona and the United States Department of the Interior. See Appendix D for Resolution Number 07-05 and 2018-04. Finally, the District recently joined efforts with the Bureau of Reclamation and ADWR to participate in the Lower Basin Drought Contingency Operations Intentionally Created Surplus program (LB DCP). The conserved water will be stored in Lake Mead for a variety of future uses and/or pledged to help sustain the entire Colorado River System.

4 – Conjunctive Use - There are no ground water basins, ground water recharge areas, or conjunctive use programs currently in place within the District's boundaries. All water within the District is considered Colorado River water with the exception of a limited amount of reclaimed water.

5 – Land Management – There are some parcels of land lying within the District whose soil and topography make them unsuitable for farming. These parcels have been excluded from receiving an agricultural entitlement from the District.

6 – Operational Practices and Procedures – The District does not own, operate, or maintain any production (wells), storage, distribution, drainage, or recharge facilities. All the aforementioned facilities located within the District are owned, operated, and maintained by non-district entities. These owners have developed their own maintenance schedules to ensure that their facilities are operating appropriately. The District does inspect meter installations and irrigation ditches to confirm compliance with District Policies. The District recently passed Resolution 2019-01 to require all AG wells to install Water Flow Meters and have approved a 50% cost share for the installation of new District approved meters.

7 – Distribution System Scheduling - The District itself does not own, operate, or maintain any distribution facilities. All distribution facilities within the District's boundaries are owed, operated, and maintained by non-District entities. These entities provide their own personnel to operate and maintain their facilities. Distribution facilities within the district include pipes, valves, and accessory facilities owned and operated by utility companies located within the District. They also include ditches, gates, and accessory facilities owned and operated by agricultural entities within the District. The owners of the facilities schedule their own operation of their facilities. The District does not do any distribution system scheduling.

8 – On-farm Irrigation Scheduling - The District does not own, operate, or maintain any wells itself. All wells within the District's boundaries are owed, operated, and maintained by non-District entities. These entities provide their own personnel to operate and maintain their facilities. The owners of the facilities schedule their own operation of their facilities. Thus, the District does not do any irrigation scheduling.

9 – Pump Efficiency Evaluations – The District itself does not own, operate, or maintain any wells. All wells within the District's boundaries are owed, operated, and maintained by non-District entities. These entities provide their own personnel to operate and maintain their facilities. The District does not currently have a program to evaluate private wells within the District to determine their energy and water efficiency.

10 – Distribution Control – The District itself does not own, operate, or maintain any distribution facilities. All distribution facilities within the District's boundaries are owned, operated, and maintained by non-District entities. These entities provide their own personnel to operate and maintain their facilities. Distribution facilities within the district include pipes, valves, and accessory facilities owned and operated by

utility companies located within the District. They also include ditches, gates, and accessory facilities owned and operated by agricultural entities within the District. The District does not have the ability to modify any of the distribution facilities owned by others.

11 – Re-use Systems – The District itself does not own, operate, or maintain any re-use facilities. All re-use facilities within the District's boundaries are owned and operated by non-District entities. These entities provide their own personnel to operate and maintain their facilities. Re-use facilities within the district include pipes, valves, and accessory facilities owned and operated by utility companies located within the District. There is currently only 1 re-use user within the District.

12 – Reduction of Conveyance Losses – The District does not own, operate, or maintain any conveyance facilities, but recognizes the need to reduce losses through these facilities. The District passed Board Resolution 2008-09 on November 5, 2008. This resolution required the lining of all irrigation ditches within the District. It reads in part, "All irrigation ditches located within the boundaries of the District must be lined and maintained to the minimum standards established by the District at the expense of the Water User." All the current agricultural ditches are lined with the exception of a small canal on Bureau of Land Management property that is currently being farmed. The total acreage being farmed on this land is 93 acres with 6,000 lineal feet of canal being used.

13 – Construction, Lining or Covering of Regulatory Reservoirs – The District itself does not own, operate, or maintain any storage facilities. There are no regulating reservoirs within the District. All storage facilities within the District's boundaries are owned and operated by non-District entities. These entities provide their own personnel to operate and maintain their facilities.

14 – Laser Land Leveling – All the agricultural land within the District has been laser-leveled. Much of the land is leveled annually.

Step 7 – Selected Measures and Projected Results

1 – Continue to develop a crop efficiency program. Farmers in the area have been evaluating and experimenting with different crops with lower water use, such as hemp, teff, etc. The District will work with the farmers to better understand the consumptive use savings associated with growing these crops instead of the crops typically grown in the District. This proposed program is part of the District's approved ICS Exhibit.

2 – The District is always trying to develop a more accurate water metering program to account for water used within the District. The District recently passed Resolution 2019-01 to require all AG wells to install Water Flow Meters and have approved a 50% cost share for the installation of new District approved flow meters.

3 – Continue to update the Agricultural well inventory with yearly inspections and flow metering tests at each point of diversion. This will allow the District to track and more accurately account for the water used for AG water use within the District.

4 – Continue to assess the water needs for the District. The District allocates permanent water entitlements for residential and commercial property and currently there are approximately 9,000 vacant lots within the District that have permanent water entitlements. The homes that may ultimately be built on these lots will provide housing for approximately 22,500 more people in the District. The District plans to accommodate long-term growth beyond these already dedicated supplies through the transfer of water from Agricultural to Urban uses.

5 - Work with local realtors, Mohave County, ADWR and the general public to understand the importance of checking with the District to verify if an allocation has been approved for their parcel of land. This would help ensure that their parcel has a legal right to the water they are using. This would help to eliminate the water being used and not accounted for by the District increasing the accuracy of our water reporting.

6 – Update the District's water inventory based on all the parcels accounted for by Mohave County Assessor's office that are located within the District's accounting area. This will take six to twelve months to complete.

Step 8 – Environmental Review

The District does not own, operate, or maintain any wells, distribution, or storage facilities. The users own and operate their own facilities. The District has no water uses for canal seepage, evaporation, spills, or riparian uses in canals since the District does not own or operate any of these facilities. There are agricultural and M & I water uses within the District. There are a number of developments and commercial projects within the District's boundaries. The facilities owned and operated by the users have not created any new habitat or created any environmental compliance issues that the District is aware of.

The water quality reports from the various utility companies along with the study conducted by ADEQ indicate that water quality issues are primarily point source pollution caused by seepage from septic systems and naturally occurring arsenic.

Step 9 – Implementation Schedule and Budget for Each Selected Measure

1 – Develop a crop efficiency program as part of the District's proposed EC ICS Program, which is expected to be in place by January 2020. Farmers in the area have been evaluating and experimenting with different crops that use less water such as hemp, teff, etc. The District will work with farmers to evaluate the consumptive use savings associated with planting these new types of crops versus those traditionally grown in the District. The budgeted cost of this program should be a minimal incremental cost to the District as part of its EC ICS program.

2 - Develop an improved water-metering program. The District is always trying to develop a more accurate water metering program. The District recently passed Resolution 2019-01 to require all AG wells to install Water Flow Meters and have approved a 50% cost share for the installation of new District approved flow meters. This program will take approximately eight months to complete. The total cost of the program is estimated at $125,000.

3 – Continue to update the Agricultural well inventory with yearly inspections and flow metering test results at each point of diversion. This will allow the District to track and more accurately account for the water used for AG water use within the District. This project is being updated on a yearly basis. The budgeted cost of this program should be minimal.

4 – Continue to assess the water needs for the District. The District allocates permanent water entitlements for residential and commercial property and currently there are approximately 9,000 vacant lots within the District that have permanent water entitlements. The homes that may ultimately be built on these lots will provide housing for approximately 22,500 more people in the District. As the area continues to grow, the District plans to accommodate long-term growth through the transfer of water from Agricultural to Urban uses. The budgeted cost of this program cannot be estimated at this time.

5 – Develop an educational pamphlet designed to work with local realtors, Mohave County, ADWR and the general public to understand the importance of checking with the District to verify if an allocation has been approved for their parcel of land. This education pamphlet would help promote community awareness that their parcel has to have a legal right to the water they are using. This would help to eliminate the water being used and not accounted for by the District increasing the accuracy of our water reporting. The budgeted cost of this should be minimal.

6 - Update the District's current water inventory based on all the parcels accounted for and provided by Mohave County Assessor's office. This will ensure all parcels have been captured in the water inventory. This will take six to twelve months to complete. The budgeted cost of this program should be minimal.

References

Bureau of Reclamation (BOR)

Mohave Valley Irrigation and Drainage District (MVIDD or District), Corporate Records

Interstate Compact Defining the Boundary between the States of Arizona and California

Minutes of the Mohave County Board of Supervisors December 23, 1963

U.S. Supreme Court Reports, Bryant v. Yellen

Mohave County Board of Supervisors Resolution No. 248

Arizona Department of Water Resources

Mohave County Assessor's Office

United States Geological Survey (USGS)

USDA Natural Resource Conservation Service, Soil Maps

www.Desertmuseum.org

Arizona Game and Fish Department

Western Regional Climate Center wrc@dri.edu

www.Ag.Arizona.edu

www.USA.Com

Bella Vista Homeowners Association

Bermuda Water Company, Inc. (Utilities, Inc.)

EPCOR Water

Lagoon Estates Water Company

Fort Mojave Tribal Utility Authority

Sunrise Vistas Utilities

Technical Consultants, Inc.

Arizona Department of Environmental Quality (ADEQ)

www.Wateruseitwisely.com

Western Resource Advocates

Arizona Municipal Water Users Association

Central Arizona Project

City of Bullhead City

Wellton-Mohawk Irrigation and Drainage District

Appendices –

Appendix A –	Soil Maps
Appendix B -	ADWR Exempt Well Listing
Appendix C -	Board Resolutions Water Allocations
Appendix D -	Board Resolution Water Transfer
Appendix E -	Water Quality Data - 5 utility companies' annual Consumer Confidence Reports for 2013 through 2018
Appendix F -	The Future of Water Management Presentation presented to the public on January 04, 2018.