ARVIN COMMUNITY SERVICES DISTRICT
ARVIN, CALIFORNIA

2010
URBAN WATER MANAGEMENT PLAN

Prepared by:

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Arvin Community Services District

Arvin, Kern County, California

2010 URBAN WATER MANAGEMENT PLAN

INDEX

Arvin Community Services District
2010 Urban Water Management Plan
March 2015

The following is Arvin Community Services District Initial Urban Water Management Plan ("UWMP"). This plan is written to conform to the 2010 UWMP Guidelines and will be updated in 2016 to reflect water production and demand data for the years 2010 – 2015. The 2015 UWMP Guidebook is being prepared at the time of this writing. New UWMP requirements and updated water production and conservation data will appear in the 2015 plan.

SECTION 1

PLAN PREPARATION

1.1 PUBLIC PARTICIPATION

Arvin Community Services District ("ACSD" or "District") prepared this first Urban Water Management Plan with input from the community at a public hearing held on March 18, 2015. This first plan reflects information current as of December 31, 2010. It will be updated in 2016. The plan was adopted by the District's Board of Directors on March 18, 2015.

1.2 AGENCY COORDINATION

ACSD sent copies of this plan to the City of Arvin, Arvin Edison Water Storage District ("AEWSD"), and the Kern County Water Agency ("KCWA").

ACSD encourages public participation in all of its planning efforts by having monthly Board of Director's meetings which are open to the public. All District policies are set by the Board at these semi-monthly meetings. The UWMP was available for review in the District's office before the public hearing in March. Water users were notified of the UWMP's availability for review by legal notice in the local newspaper. ACSD water users had access to the plan for review before it was approved and adopted.

AEWSD, which ACSD is located within, reviewed and provided comments to the administrative draft of this UWMP.

Table 1
Coordination with appropriate agencies

Agencies	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not involved / No information
KCWA		X			X		
AEWSD		X	X		X		
City of Arvin			X		X		
Kern County					X		

1.3 IMPLEMENTATION

This initial UWMP will be implemented on the day that it is adopted by the District's Board of Directors.

SECTION 2

SYSTEM DESCRIPTION

2.1 SUPPLIER SERVICE AREA

ACSD was created in 1957 for the purpose of providing domestic water to the citizens of the City of Arvin and to a lesser extent, to lands outside the City boundary. ACSD is regulated by the State Water Resources Control Board, Division of Drinking Water. Over 95% of the service area population is within the City of Arvin.

The current service area encompasses approximately 5 square miles within the City of Arvin, together with a few small residential tracts and individual services that are located in the County of Kern. The District is situated at the south end of the San Joaquin Valley, approximately 110 miles north of Los Angeles and 290 miles south of San Francisco. It is about 5 miles west of the foot of the southern end of the Sierra Nevada Mountain chain, which mountains are also known as the "Tehachapis".

The District experienced a rapid population growth in the first 8 years of the first decade of the 21st century. However this growth slowed over the last two years of the decade. Presently, new residential services are added to the system as subdivisions slowly build out.

The ground surface within the service area slopes gently downward from east to west (about 5 feet across the City) and about 50 feet downward from north to south. Ground surface elevations in the ACSD Service Area are about 400 feet MSL.

The climate is typical of the lower San Joaquin Valley. Summers are normally hot and very dry with temperatures often exceeding 100°F. Winters are cool with temperatures ranging from 40°F to 60°F, occasionally dropping below 32°F. Winter months commonly have night and morning fog.

Average annual rainfall ranges from 6 - 7 inches with most rainfall occurring between November and April. Predominant winds during the winter are less than 10 mph from the northwest. High winds occasionally occur through the year producing dust storms.

Climate Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Monthly Avg. Eto (in)	1.25	2.07	3.85	5.69	7.48	7.98	8.23	7.40	5.78	4.11	2.04	1.18	57.06
Avg. Rainfall (in)	1.06	1.18	1.11	0.67	.22	0.07	0.01	0.04	0.10	0.30	0.59	0.86	6.21
Avg. Temp. (° F)	47.9	52.8	57.2	62.9	70.4	77.7	83.8	82.1	76.9	67.3	55.6	48.0	-

The land uses within the District are primarily residential with commercial activities generally centered along the main street of the town. Agricultural commodity processing and packing plants located along the east side of the city. There are several parks located throughout the District, one high school, two junior high/middle schools, a vocational school, and two elementary schools.

The District has the following classes of service accounts (percentages are approximate):

1.) Single Family Residential (93%)
2.) Multi-Family Residential (2%)
3.) Commercial / Institutional (4%)
4.) Industrial (0.5%)
5.) Landscape Irrigation (0.5%)
6.) Other (less than 0.1%)

Population

The following Table 2 presents the Arvin census data from the State of California Department of Finance. The average rate of growth for Arvin over the ten year period from April 1, 2000 to April 1, 2010 was 4.07%. Using this growth rate, Table 2 contains the population projection for Arvin from 2010 through 2020.

Table 2

Historic Population and Population Projection for Arvin Community Services District						
YEAR	**POPULATION**	**Comment**		**YEAR**	**POPULATION PROJECTION**	**Comment**
2000	**12,956**	**4-1-2000**		**2010**	**19,270**	
2001	**13,315**			**2015**	**23,524**	
2002	**13,946**			**2020**	**28,717**	
2003	**14,781**			**2025**	**35,056**	
2004	**15,485**			**2030**	**42,795**	
2005	**16,095**			**2035**	**52,242**	
2006	**16,353**					
2007	**17,685**					
2008	**18,332**					
2009	**18,800**					
2010	**19,270**					
2010	**19,304**	**4-1-2010**				
Source: Department of Finance Data 2000-2010						
Calculated Rate of Annual Growth: 4.07%				**Projected Rate of Annual Growth: 4.07%**		

The District grew at a rapid pace from 2001 – 2008, an average of 4.67%, however, in the years from 2008 – 2010 the District's population increased at only 2.53%. The growth rate for the District for the ten year period 4-1-2000 to 4-1-2010 was 4.07%. This growth rate was used to project the population into the future.

SECTION 3

SYSTEM DEMANDS

3.1 WATER USE

ACSD Service Area

The number of connections within ACSD's service area has gradually increased over the past years. However, the growth in water deliveries has been at a slower pace, and this is illustrated by Table 3, which sets forth historic water production and water deliveries for 2001 – 2010. While the population increased at a rate of about 4.1%, the number of connections increased at a rate of about 3.1%.

Table 3

Historic Water Production and Water Deliveries			
Year	**Number of Connections**	**Water Production (Acre-Feet)**	**Water Deliveries (Acre-Feet)**
2001	2,624	2,578	2,144
2002	2,758	2,686	2,256
2003	2,829	2,848	2,304
2004	2,892	2,885	2,302
2005	2,996	2,748	2,282
2006	3,194	3,010	2,501
2007	3,390	3,176	2,381
2008	3,448	2,903	2,398
2009	3,497	3,188	2,501
2010	3,446	2,946	2,299

Water Demands - Water Demand Projections

Table 4

Water Deliveries — Actual, 2010 (Acre-Feet)

	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	3,328	1,774	0	0	0
Multi-family	75	166	0	0	0
Commercial*	135	232	0	0	0
Industrial	18	50	0	0	0
Institutional/Governmental*	*				
Landscape	18	68	0	0	0
Agriculture	0	0	0	0	0
Other	18	10	0	0	0
Total	3,446	2,299	0	0	2,299
Total Number of Accounts			3,446		

*Note: ACSD combines Commercial and Institutional uses in its reporting because the Institutional/Governmental uses are a minor number of its accounts.

Table 5

Water Deliveries — Projected, 2015 (Acre-Feet)

	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	3,719	2,558	0	0	2,558
Multi-family	84	239	0	0	239
Commercial/Institutional	151	335	0	0	335
Industrial	20	72	0	0	72
Landscape	20	98	0	0	98
Agriculture	0	0	0	0	0
Other	20	15	0	0	15
Total	4,014	3,316	0	0	3,316
Total Number of Accounts			4,014		

Notes: 1. See footnotes for Table 4, 2. Growth rate for connections at 3.1% (historic rate), 3. Target gpcd and population used for produced water projections.

Table 6
Water Deliveries — Projected, 2020 (Acre-Feet)

	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	4,332	2,868	0	0	2,868
Multi-family	98	268	0	0	268
Commercial/Institutional	176	375	0	0	375
Industrial	23	80	0	0	80
Landscape	23	109	0	0	109
Agriculture	0	0	0	0	0
Other	23	16	0	0	16
Total	4,676	3,718	0	0	3,718
Total Number of Accounts			4,676		

Notes: 1. See footnotes for Table 4.

Table 7
Water Deliveries — Projected 2025, 2030 (Acre-Feet)

	2025		2030	
	Metered		Metered	
Water use sectors	# of accounts	Volume	# of accounts	Volume
Single family	5,407	3,417	5,880	4,305
Multi-family	114	319	133	402
Commercial/Institutional	205	447	239	563
Industrial	27	96	32	121
Landscape	27	130	32	164
Agriculture	0	0	0	0
Other	27	20	32	25
Total	5,447	4,429	6,346	5,580

Notes: 1. See footnotes for Table 4, 2. Target gpcd reduced to 120 gpcd from 127 (2020 target).

Low Income Family water demands

The City of Arvin is classified as a disadvantaged low-income community. The City of Arvin's population has 37% of its families with children under 18 years of age below the poverty level. This was used as an indicator of water demands below poverty level. Table 8 reflects 37% of the residential water demands in the community.

Table 8
Low-income projected water demands (acre-feet)

Low Income Water Demands[1]	2015	2020	2025	2030
Single-family residential	947	1,061	1,264	1,593
Multi-family residential	88	99	118	149
Total	1,035	1,160	1,383	1,742

Water Sales to Other Agencies

No water sales have been made to other agencies and none are planned in the future.

Table 9
Sales to Other Water Agencies

Water Distributed	2005	2010	2015	2020	2025	2030
No Water Sales Made or Planned	0	0	0	0	0	0
Total	0	0	0	0	0	0

Additional Water Uses and Losses

There is a significant difference in the "Water Production" and the "Water Deliveries" in Table 3. The difference between the water produced and the water deliveries is thought to be due to two causes: 1. pipe breaks, and 2. differences in the accuracy of the pump station metering and the individual service meters. The following Table 10 reflects the impacts of the unaccounted for water. It is surmised that the "losses" are not truly water that is "lost" but that a significant amount of the unaccounted for water is due to metering differences. Table 10 reflects the assumption that the "losses" will be reduced from the current levels to about 12% in 2020 and about 3% by 2030. This will be achieved through meter testing and replacement of faulty meters, and through replacement of sections of District pipelines that exhibit a high frequency of pipeline failures. Any losses due to pipe breaks would eventually return the water to the useable groundwater aquifer.

Table 10
Additional Water Uses and Losses (Acre-Feet)

Water Use	2005	2010	2015	2020	2025	2030
Saline barriers	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0
Raw water	0	0	0	0	0	0
Recycled water	0	0	0	0	0	0
System losses	465	647	452	368	283	173
Other	0	0	0	0	0	0
Total	**465**	**647**	**452**	**368**	**283**	**173**

Table 11
Total Water Use (Acre-Feet)

Water Use	2005	2010	2015	2020	2025	2030
Total water deliveries	2,282	2,299	3,316	3,718	4,429	5,580
Sales to water agencies	0	0	0	0	0	0
Additional water uses and losses	465	647	452	368	283	173
Total	**2,748**	**2,946**	**3,768**	**4,085**	**4,712**	**5,752**

Projections to Wholesale Suppliers

The District does not contract with any wholesaler for water. It is entirely dependent on groundwater for its supply.

Table 12
Retail Agency Demand Projections Provided to Wholesale Suppliers

Wholesaler	Contracted Volume	2010	2015	2020	2025	2030
n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

Baselines and Targets

The following Table 15 develops the "Five" and "Ten" Year Average Per Capita Water Use Targets utilizing Option 1. 80% of baseline gpcd water use. Arvin's water production records from 2001 through 2010 were used for calculation of the Baselines and Targets.

Table 13
Base Period Ranges

Base	Parameter	Value	Units
10 to 15-year base period	2008 total water deliveries	2,903	acre-feet
	2008 total volume of delivered recycled water	0	acre-feet
	2008 recycled water as a percent of total deliveries	0	percent
	Number of years in base period	10	years
	Year beginning base period range	2001	////////////////////
	Year ending base period range	2010	////////////////////
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2006	////////////////////
	Year ending base period range	2010	////////////////////

Table 14
Base Daily Per-Capita Water Use – 10 Year Range

Calendar Year	Number of Connections	Population	Annual Water Production (af)	Annual Daily Water Use (gpcd))
2001	2,624	13,315	2,578	173
2002	2,758	13,946	2,686	172
2003	2,829	14,781	2,848	172
2004	2,892	15,485	2,885	166
2005	2,996	16,095	2,748	152
2006	3,194	16,353	3,010	164
2007	3,390	17,685	3,176	160
2008	3,448	18,332	2,903	141
2009	3,497	18,800	3,188	151
2010	3,446	19,270	2,946	136
			10 Year Average	**159**
Base Daily Ten-Year Per-Capita Water Use Target				**127**

Note: Base Daily Ten-Year Per-Capita Use Target = 80% of Average of Years 2001-2010

Table 15
Base Daily Per-Capita Water Use – 5 Year Range

Base Period Year		Distribution System Population	Daily Gross Water Use (gpd)	Annual Daily Per-Capita Water Use (gpcd)
Sequence Year	**Calendar Year**			
1	**2006**	16,353	2,687,257	164
2	**2007**	17,685	2,835,255	160
3	**2008**	18,332	2,591,821	157
4	**2009**	18,800	2,845,557	151
5	**2010**	19,270	2,629,461	136
			5 Year Average	151
Base Five-Year Daily Per Capita Water Use Target				**143**

Note: Base Daily Per-Capita Use Target = 95% of Average of Years 2006-2010

Table 16
Daily Per-Capita Water Use Targets

Ten Year Average Per-Capita Water Use	**159 gpcd**
2015 Daily Per-Capita Water Use Target	**143 gpcd**
2020 Daily Per-Capita Water Use Target	**127 gpcd**

Water Use Reduction Plan

The City of Arvin is classified as a disadvantaged low-income community. The cost of water is a factor that governs water use. The District is 100% metered. Each residence is billed monthly according to its water use. The residents are more aware of their water costs than in more affluent communities, where the monthly water bill is a smaller part of the monthly budget. Therefore the community is involved in policing itself and residents frequently report to the Board about water waste in the community.

The District encourages water conservation through the measures detailed in Section 5, Water Shortage Contingency Planning. Additionally the District patrols the community and contacts residents that are wasting water. See Section 6, Demand Management Measures.

SECTION 4

SYSTEM SUPPLIES

4.1 WATER SOURCES

4.1.1 Groundwater

The District is totally dependent on groundwater for its water supply. The District is located in the Kern County sub-basin of the Tulare Lake Basin, within the Kern River Hydrographic Unit.

The District's system is as follows:

- Six active water wells
- 0.5 million gallons of above-ground water storage with booster pumping plant

The total combined capacity of the wells is 5,300 gpm. The wells can produce at total of approximately 8,500 acre-feet per year. Actual water production is about 3,000 acre-feet per year.

ACSD is within the boundaries of AEWSD. ACSD landowners pay an annual groundwater benefit charge on their property tax bills to AEWSD because of the benefit that is derived from the importation of surface water by AEWSD. This has reduced groundwater pumping and stabilized groundwater levels. AEWSD has been importing surface water into its service area since 1966, which consequently reduced the demand for groundwater through direct deliveries to agricultural water users. In addition, AEWSD also imports surface water for direct recharge into the groundwater basin via groundwater recharge facilities for extraction at a later time. In addition to the stabilized groundwater levels, there is also a groundwater quality benefit since the bulk of the imported water originates in the Sierras and is imported via the Friant-Kern Canal. However, AEWSD also imports water supplies from the State Water Project (California Aqueduct) and the Kern River.

AESWD has contracts for and purchases surface water from the federal Central Valley Project ("CVP") Friant Division and operates groundwater recharge facilities covering nearly 1,800 acres, that benefit its entire approximately 132,000 acres, which includes ACSD. According to AEWSD's 2003 Groundwater Management Plan, AEWSD has been importing surface water into its service area since 1966. As of 2002, it had imported over 5,700,000 acre-feet of surface water, and has recharged approximately 1,608,000 acre-feet (net) of water to the groundwater basin through its 2002 Water Year (February 2003). Prior to AEWSD's project, groundwater levels were declining and groundwater overdraft was estimated at 126,000 acre-feet per year. Average static groundwater depths in 1966 were about 370 feet and without the AEWSD project, static water levels were

projected to increase to 595 feet by the year 2002. With AEWSD's project, the average groundwater levels had stabilized and recovered to about 330 feet by the end of 2002. AEWSD's water project has clearly benefitted lands within its boundaries, including ACSD, which has resulted in a reliable groundwater supply for the District. It should be noted that as a result of the San Joaquin River Settlement, AEWSD's supplies from the Friant Division of the CVP are being reduced, although the ultimate reduction after mitigation measures are implemented is not presently known. See maps in Appendix IV, AEWSD 2003 Groundwater Management Plan. (Text only is included in Appendix IV. Tables and Maps are not included herein – but are available on line.)

4.1.2 Surface Water

The District has no access to wholesale surface water. It is distant 30 miles from the nearest water treatment plant (ID4's Henry Garnett Water Purification Plant). It would not be feasible to connect to this plant, and further, the District has no contract for a state surface water supply from the Kern County Water Agency nor for a federal water supply from the Bureau of Reclamation for direct delivery to water users or groundwater recharge purposes.

Table 17
Water Supplies — Current and Projected

Water Supply Sources		2010	2015	2020	2025	2030
Water purchased from:	**Wholesaler supplied volume (yes/no)**	n/a	n/a	n/a	n/a	n/a
Wholesaler	none	0	0	0	0	0
Supplier-produced groundwater	yes	2,946	3,768	4,085	4,712	5,752
Supplier-produced surface water	none	0	0	0	0	0
Transfers in		0	0	0	0	0
Exchanges In		0	0	0	0	0
Recycled Water		0	0	0	0	0
Desalinated Water		0	0	0	0	0
Other		0	0	0	0	0
Total		**2,946**	**3,768**	**4,085**	**4,712**	**5,752**

Table 18

Wholesale Supplies — Existing and Planned Sources of Water (Acre-Feet per Year)

Wholesale sources	Contracted Volume	2015	2020	2025	2030
None	0	0	0	0	0

4.1.3 Present and Projected Groundwater Production

The following Tables 19 and 20 present the past and present groundwater production within the District together with projections through the year 2030.

Table 19

Groundwater — Volume Pumped (Acre-Feet)

Basin Name	Metered or Unmetered	2006	2007	2008	2009	2010
Kern County Sub-basin	**Metered**	3,010	3,176	2,903	3,188	2,946
Kern County Sub Basin	**Unmetered**	0	0	0	0	0
Total Groundwater Pumped		3,010	3,176	2,903	3,188	2,946
Groundwater as a Percent of Total Water Supply		100%	100%	100%	100%	100%

Note: Kern County Sub-basin of the Tulare Lake Basin

Table 20

Groundwater — Volume Projected to be Pumped (Acre-Feet)

Basin name(s)	2015	2020	2025	2030
Kern County Sub Basin	3,768	4,085	4,712	5,752
Total groundwater pumped	3,768	4,085	4,712	5,752
Percent of total water supply	100%	100%	100%	100%

Note: Kern County Sub-basin of the Tulare Lake Basin

4.2 TRANSFER OR EXCHANGE OPPORTUNITIES

The District has no opportunities to exchange or develop transfers of surface water either on a long or short term basis. The District is totally dependent on groundwater for its water supply and has

no contract for state or federal surface water for delivery to water users or groundwater recharge purposes.

4.3 DEVELOPMENT OF DESALINATED WATER

There are no viable sources of salt water within the District's service area and therefore no opportunities for the development of this source. The area is not underlain by perched water nor is it near a body of saline surface water.

4.4 WATER RECYCLING

Water from the City of Arvin's sewer treatment facility is recycled for irrigation of forage crops on lands west of the District. This use of the recycled water generated from the District's groundwater is used to replace water that would otherwise be pumped from the groundwater basin. Therefore the District benefits from the City of Arvin's recycled water, resulting in reduced depletion of the groundwater resource that would otherwise be used by irrigators, and therefore, the benefit is shared by both agriculture and domestic water users. The wastewater has not been considered a candidate for tertiary treatment and reapplication on lands within the District's service area or for human consumption.

4.5 FUTURE WATER PROJECTS

The District is not able to access surface water for meeting its water demands or recharge of groundwater. It must continue to rely on groundwater for its future water supplies. Future projects for the District involve replacing old existing wells with new wells that will not require treatment for arsenic or other constituents at this time. Arsenic is a contaminant that is above the maximum concentration limit of 10 ug/l in all of the District's older wells. ACSD is currently under a compliance order from the EPA to solve the problem. Because arsenic concerns, the District applied for a Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84) grant to help it achieve compliance with the order. The District is implementing a plan to drill new replacement wells in areas that exhibit acceptable water quality, including arsenic. If wells do not meet acceptable levels of arsenic the District will install centralized arsenic treatment.

Table 21
Future Water Supply Projects

Project	2010	2015	2020	2025	2030
Replace Old Existing Water Supply Wells	Receive Authorization & Funding for Feasibility Study	Receive Funding – and Drill Two New Replacement Wells	Procure Funding and Drill Three New Replacement Wells	Procure Funding and Install Arsenic Treatment and Distribution Pipelines – (if needed)	Add New Wells as Required by Community Growth

SECTION 5

WATER SUPPLY RELIABILITY
AND

WATER SHORTAGE CONTINGENCY PLANNING

5.1 WATER SUPPLY RELIABILITY

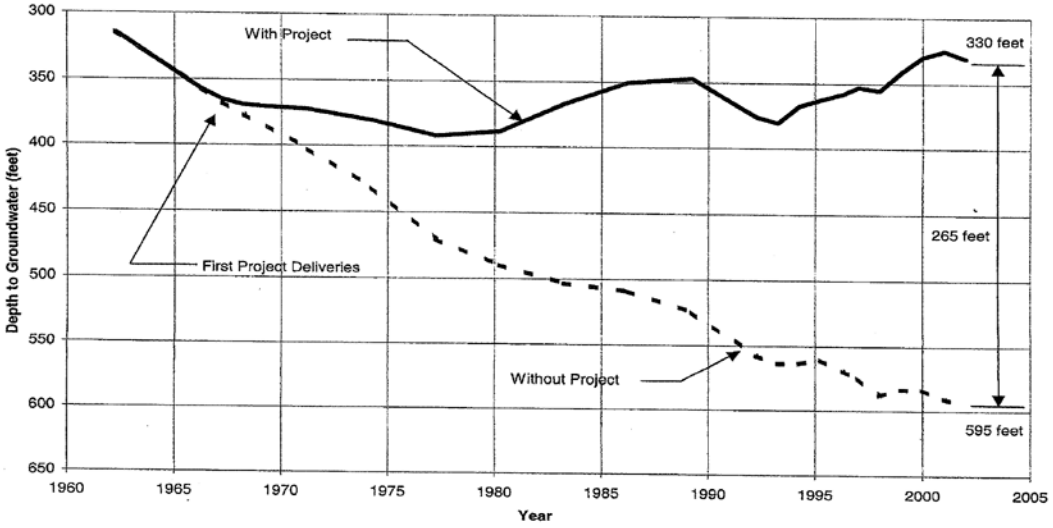
Groundwater provides a medium-to-good quality of water to the area. From the time of the creation of the District until the present, and well into the future, groundwater will be the only source of water for the District.

Section 4.1.1, above, discusses the AEWSD groundwater management program and the effects that AEWSD's successful program has had on stabilizing groundwater levels within the basin. Groundwater will continue to be a reliable source for the District well into the future because of the effectiveness of AEWSD's program. The following Figure 12, from AEWSD's 2003 Groundwater Management Plan, demonstrates the effectiveness of AEWSD's program. (For brevity in this UWMP, only a few figures and maps are included herein – the Tables and Maps from the Groundwater Management Plan are not included herein, but are available on line.)

Figure 12

Arvin-Edison Water Storage District

AVERAGE STATIC GROUNDWATER DEPTH IN DISTRICT



Groundwater as a supply is much different than surface water, in that the effects of a drought are not directly reflected in the reliability of the supply – but more likely – in the depth of the groundwater. Pumps must be set deep enough to provide reliable service in time of extended drought. In extreme cases, the effects of lowering groundwater levels can be that the groundwater drops below the depth of the well itself, and therefore renders the well inoperable. A single dry year usually has a minimal effect on groundwater levels in Kern County. However, multiple dry years do have an effect and this is due to several reasons: 1. Increased pumping of groundwater by those who have temporarily lost their surface water supplies, 2. Lower groundwater levels resulting from the absence of surface water for direct recharge, 3. Reduced groundwater recharge from excess surface water application to crops and landscaping, and 4. Reduced groundwater recharge due to the absence of rainfall, resulting in reduction or absence of stream and river flows.

Therefore it is necessary that municipal water purveyors that depend on groundwater to assure that adequate groundwater recharge occurs and that wells are sufficiently deep in order to provide water during times of extended drought (occasionally pumps must be lowered in the wells due to changes in groundwater levels.)

The District's existing wells are of varying depths. Well depths, together with the static water levels, are listed below.

Table 22
Current Well Information

Well Identifier	Well Depth (Feet Below Ground Surface)	Static Water Levels (Feet Below Ground Surface)
Well 1	730	No Measurement
Well 5	720	360
Well 6	820	380
Well 8	800	370
Well 10	1000	270
Well 11	1080	480

Note: It is anticipated that Well 1 will be replaced via a grant from the EPA.

Table 23
Basis of Water Year Data

Water Year Type	Base Year(s)
Average Water Year	2009
Single-Dry Water Year	1977
Multiple-Dry Water Years	1987-1992

Table 24
Supply Reliability — Historic Conditions

Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
		Year 1	Year 2	Year 3	Year 4
Groundwater	2,946 af	2,946 af	2,946 af	2,946 af	2,946 af
Percent of Average/Normal Year:	100%	100%	100%	100%	100%

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Table 25
Factors Resulting in Inconsistency of Supply

Water Supply Source	Limitation	Legal	Environ-mental	Quality	Climatic	Additional Information
Groundwater	None	None	None	Arsenic	Drought	n/a

There are two factors that could affect the sustainability of the groundwater supply for the District. These are groundwater quality and drought.

Groundwater Quality

The District's old wells contain arsenic at concentrations over the maximum concentration limit of 10 ug/l (which was changed in 2006 from a maximum concentration limit 50 ug/l). The District applied for and received a grant for studying groundwater conditions in the area around the District. The study involved selection of locations that are thought to have lower concentrations of arsenic, and construction of three test wells to verify that low domestic wells can be drilled that will meet the arsenic standard. In the event that new wells with acceptable water quality cannot be drilled, it is planned to install centralized arsenic treatment to solve the problem.

Drought

It has been previously noted that an extended drought can have an effect on groundwater pumping levels. The District has greatly benefitted from AEWSD's project, which has stabilized groundwater levels in the area. Therefore the District's exposure to effects of drought have been mitigated. However, that is not to say that groundwater levels will not drop due to an extended drought or other impacts reducing importation of surface water – but it is to say that groundwater levels will be much better than they would have been absent AEWSD's program, and the groundwater supply will be sustained – even through an extended period of drought.

Table 26
Water Quality – Current and Projected Water Supply Impacts

Source	Condition	2010	2015	2020	2025	2030
Groundwater	Arsenic	Old wells are impacted by arsenic	Two new replacement wells – Remaining old wells are impacted by arsenic	Three new replacement wells drilled	Install arsenic treatment and distribution pipelines as needed	New wells drilled as demand dictates

The planned program is to replace the old arsenic-impacted wells with new wells meeting the 2006 arsenic standard. Experience with the aquifer will determine if new wells can be drilled that will meet the standard, or if arsenic treatment will be required for these new wells. Financing will be a combination of grant and state revolving fund loans. The ratio of grant to load will depend on the capability of the District's residents to pay back loan funds through water tolls. If arsenic treatment is required, it will be financed and constructed sometime between 2017 and 2025, depending on availability of funding.

5.2 WATER SHORTAGE CONTINGENCY PLAN

5.2.1 The Plan

This Water Shortage Contingency Plan addresses the Arvin Community Services District's (District) policy to reduce water consumption in the community of Arvin during a drought emergency. The District is 100% metered.

The Arvin Community Services District has not experienced a severe water supply shortfall due to a drought in its 58 years of existence because the groundwater resource underlying the District has remained stable as a result of importation of surface water by AEWSD. The District has pumped 100% of its water demand in years of drought. An extended drought would cause the District to lower its pumps I its wells due to lowering water levels, but the supply would remain relatively stable.

The following is the District's plans to deal with a water shortage in the event of simultaneous dry years and for dealing with a catastrophic event such as the effects of an earthquake

5.2.2 Stages of Action

The Plan calls for four stages of action to take place in the event that the State of California declares a drought emergency requiring certain levels of water conservation. While the District's water supply will remain relatively constant because of the availability of ground water, the District is committed to the following water conservation action levels in order to preserve the groundwater resource for the community and its neighbors who also rely on groundwater. The District encourages water conservation as a general practice and views the following actions as steps to be taken in the event of an unusually series of dry years that requires water conservation activities to be implemented over and above the normal water conservation activities.

The District's appended Water Shortage Ordinance lists in detail the four stages of action that will be implemented in a drought emergency situation. Hereon is listed the four general categories of action and the water conservation goal of each stage. Each successive stage implements the conditions of the previous stage(s) so that the effect is accumulative as the Plan progresses through the stages.

Table 27
Stages of Action

Stage Level	Description	Action	Water Reduction Goal	Applicability
1	Drought Watch	Public Awareness / Education	Up to 10%	Voluntary
2	Drought Alert	Limits on Duration of Landscape Irrigation	Up to 25%	Mandatory
3	Drought Critical	Limits on Days of Landscaping Irrigation / Possible Water Allocation	Up to 40%	Mandatory
4	Drought Emergency	Cease Lawn Watering / Limit Watering of Trees and Ornamentals	Up to 50%	Mandatory

The plan includes fines for continued violation of the conservation measures, requires that all leaks be repaired in an expeditious manner, restricts filling or re-filling of ornamental ponds, restricts vehicle washing, implements penalties for excessive water use, and at the option of the District's Board of Directors, places a moratorium on new water services.

5.2.3 Estimated Minimum Available Water Supply for a Three-Year Period

As previously stated, the District overlies a groundwater basin that has remained relatively stable over the years due to AEWSD's project.

The following is a tabulation of water deliveries for the years 2007 – 2010.

Table 28
Historic Water Deliveries (acre-feet)

Source	2007	2008	2009	2010	Average
Groundwater	3,176	2,903	3,188	2,946	3,053

It should be noted that water deliveries are have remained relatively stable over the past few years, most likely due to the recession that began in 2008.

The three-year dry period selected for the drought conditions is the period 1987-1990.

Table 29
Supply Reliability Estimates (acre-feet)

Projected Demands	Single Dry Year	Multiple Dry Water Years			
2010	2010	2010	2011	2012	2013
2,946	2,946	2,946	3,110	3,275	3,439
% of Average Year	100%	100%	100%	100%	100%

Table 30
Projected 2010 Water Deliveries with Drought Reductions (acre-feet)

Projected 2010 Deliveries with % Reductions Indicated				
Projected 2010 Deliveries No Reduction	**With 10% Reduction**	**With 25% Reduction**	**With 40% Reduction**	**With 50% Reduction**
2,946	**2,946**	**2,651**	**1,768**	**1,473**

5.2.4 Action to Be Undertaken For A Catastrophic Interruption of Water Supplies

The following actions are planned to be implemented in the event of a catastrophic event. The District has prepared an emergency action plan which includes telephone numbers of key personnel, number for emergency responders, a plan for assessing system status and reactivating the system as quickly as possible, and a plan prioritizing the actions that need to be taken during and shortly after an emergency.

- Assess the status of water system / Reactivate as quickly as possible
  - Issue a "Boil Water" notice
  - Isolate broken mains / repair system pipe breaks
  - Assess the condition of water production facilities / repair as necessary / reactivate as quickly as possible / provide water for fire protection / implement emergency system disinfection
  - Utilize District's portable power generators as necessary
- Provide bottled water as necessary
- Communicate with the community through local radio, newspaper, District employees
- Issue emergency water uses restrictions

5.2.5 Assessment of the Impacts of Implementation of the Water Shortage Contingency Plan

A tabulation of the impacts of implementation of the Water Shortage Contingency Plan follows.

Table 31
Impacts on Revenue with Implementation of Water Shortage Contingency Plan
Revenue Impacts Based on Water Delivery Reductions

Stage	Planned Reduction	Normal Revenue	Reduced Revenue	Financial Impacts
1	10%	$1,740,555	$1,618,699	-$121,856
2	25%	$1,740,555	$1,435,916	-$304,639
3	Up to 40%	$1,740,555	$1,253,133	-$487,422
4	Up to 50%	$1,740,555	$1,131,277	-$609,278

Discussion

The District will work to reduce power costs by encouraging water use in off peak periods of the day, and power costs will reduce due to reduced water deliveries. The District will look for opportunities for cost savings by deferring certain maintenance items that can be temporarily deferred with little impact on District operations. District's operations will be streamlined to the extent that it can be while maintaining the integrity of the system. The District will seek sources of emergency funding that may become available to help finance operation of the District.

When all cost saving measures are implemented and all sources of financial assistance are exhausted, and if the need for revenue is greater than the funds generated by the reduced water sales, consideration will be given to temporarily adjusting the District's rate structure to develop the needed financial resources for maintaining reliable water service.

SECTION 6

DEMAND MANAGEMENT MEASURES

6.1 WATER DEMAND MANAGEMENT MEASURES

The District encourages the conservation of the community's water resources through programs that educate the citizens about water waste and encourage water users to use the water resource wisely. In times of statewide water supply shortages, the District implements it's Water Shortage Contingency Plan and requires that all water users comply. Demand Management Measures are discussed in Section 6.2.

6.2 DEMAND MANAGEMENT MEASURES PROGRAM

Table 32
Demand Management Measures

	Demand Management Measure	Implemented	Not Implemented	Planned Implementation Date
1	Water survey programs for SFR& MFR customers.	x		
2	Residential plumbing retrofit.		x	
3	System water audits, leak detection and repair.		x	
4	Metering with commodity rates for all new connections and retrofit existing connections.	x		
5	Large landscape conservation programs and incentives.	x		
6	High-efficiency washing machine rebate programs.		x	
7	Public information programs.	x		
8	School education programs.			2015

9	Conservation programs for commercial, industrial and institutional accounts.			2015
10	Wholesale agency programs.		x	
11	Conservation pricing.	x		
12	Water conservation coordinator.	x		
13	Water waste prohibition.	x		
14	Residential ultra-low-flush toilet replacement programs.		x	

Demand Management Measures

1. Water Survey Programs for SFR and MFR Customers

This program consists of occasional visits to selected apartment complexes and single family residences to observe water use and review water conservation measures with the manager or resident. Water savings measures are discussed together with the impacts of savings on the customer's bill. New apartment complexes are encouraged to implement low water demand landscaping as not only a demand-reduction measure but also as a cost-reduction measure. Low water use landscaping was implemented on the most-recent apartment complex that was built in Arvin.

2. Residential Plumbing Retrofit Program

The District does not have a plumbing retrofit program. It does offer low-flow water conservation kits for its customers. However, the cost of plumbing retrofits would be borne by all customers, but benefit few. It is not considered to be a fair policy to have all customers pay for plumbing retrofits for a few customers. A theoretical cost/benefit analysis follows.

Estimated cost of a residential plumbing retrofit	$5,000.00
Recovery of costs over 10 years at 3% interest	$586.00/year
Water saved by plumbing retrofits at 100 gpd for a year	36,500 gallons
District operating savings at $0.002/gal	$73.00/year

The cost of the program far outweighs the benefit. Therefore plumbing retrofit programs are not considered a feasible alternative.

3. System Water Audits, Leak Detection and Repair

The District is 100% metered and therefore water use records are available for review on a monthly basis. All accounts are reviewed on a monthly basis and usage is evaluated according to average water deliveries for the subject account and compared to normal water usage in similar demand sectors in the district. If the account shows an anomaly, then the service meter is read a second time to verify the reading. If excess water use is discovered the customer will be notified, a district employee will visit the site, determine if there is leakage in the customer's system and assist in the repair if necessary.
The District has a significant amount of un-accounted for water, some of which is due to system leaks. Older pipelines are being replaced as the funding comes available. It is felt that metering differences account for the majority of the difference because residential meters are old and slow down with age. A meter replacement program will be initiated in the upcoming years to gradually replace the old defective meters with new, more accurate meters.

4. Metering with Commodity Rates

The District is 100% metered. Bills are based on an administrative base rate and a commodity rate, and therefore the billings increase as the amount of water used increases.

5. Large landscape conservation programs and incentives.

The City Ordinances contain landscaping requirements that were prepared with input from the District. The Landscaping Ordinance is appended. The incentives for low water demand landscaping are a large reduction if water availability charges for new MFR construction, and a corresponding reduction in the monthly water bill.

6. High efficiency washing machine rebate programs.

Rebate programs for financing high efficiency washing machine replacements has not been considered to be feasible of fair for all District customers, since the cost of high efficiency washing machines would be borne by all customers, but would only benefit a limited number.

A cost/benefit analysis follows.

Cost of a high efficiency washing machine, installed	$1,750.00
Recovery of cost over five years at 3% interest	$382.20/year
Water saved over 1 year at 10 gpw x 1 wpd x 365 d	3,650 gallons
District operating savings at $0.002/gallon x 3650 gallons	$7.30/year

Again, the cost far outweighs the benefit. Therefore the washing machine rebate program is not a feasible alternative.

7. Public Information Programs

The District promotes water conservation efforts by distributing flyers with the customer's billings, and with door hangers, displays in the District office.

8. School Education Programs

The District currently does not have a school education program, but plans to implement a program in the future.

9. Conservation programs for commercial, industrial and institutional accounts

The District does not have a conservation program for these accounts, however, it does encourage recycling of water where possible in the vegetable processing plants that it serves. Metered rates discourage water waste at these facilities. The District plans to include information encouraging water conservation in the billings for these water use sectors.

10. Wholesale Agency Programs

The District is not a wholesale agency and does not purchase water from a wholesale agency.

11. Conservation Pricing

The District plans to evaluate its billing structure in the future and consider different rates based on the amount of water used by its customers. It currently has not implemented tiered rates.

12. Water Conservation Coordinator

The District's General Manager is currently the water conservation coordinator. The District is not yet large enough to justify creation of a separate water conservation coordinator position at this time. However, the District Manager assures that water conservation measures are implemented and that monthly water use reviews are conducted and that leaks and high water use accounts are promptly addressed.

13. Water Waste Prohibition

The Water Shortage Contingency Plan and District's Water Shortage Ordinance assures that water waste is addressed and customers are educated about conservation. The program has a provision for implementation of fines if needed.

14. Residential Ultra-Low Flush Toilet Replacement Programs

Water savings kits, such as low flow shower heads and water conservation kits for toilets are planned to be available at the District office in 2015. However, since the cost of water-saving toilets would be borne by all of the customers in the District, the cost would be borne by all rate payers but the savings would not be shared by all. A cost/benefit analysis follows:

Cost of a residential low-flow toilet, installed	$750.00
Recovery of cost over five years at 3% interest	$163.80/year
Water saved over 1 year at 0.5 gpf x 10 fpd x 365 d	1,825 gallons
District operating savings at $0.002/gallon x 1825 gallons	$3.65/year

The program has an undesirable cost/benefit ratio. Therefore the toilet retrofit program is not a feasible alternative.

APPENDICES

PROOF OF PUBLICATION – ARVIN TILLER

DISTRICT SERVICE AREA MAP

MINUTES OF THE SPECIAL MEETING OF THE BOARD OF DIRECTORS, March 18, 2015

PROOF OF PUBLICATION

(2015.5 C.C.P.)
(GENERAL FORM)

STATE OF CALIFORNIA
County of Kern } ss.

I, the undersigned, am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a part of or interested in the above entitled matter. I am the chief clerk/publisher of *The Arvin Tiller*, a newspaper of general circulation, printed and published weekly, in the City of Arvin, County of Kern, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court order number 37403, of the County of Kern; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and in any supplement thereof on the following dates, to-wit: March 4, 2015

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

David Alvarez
(Signature)

Executed on 3-4-15
at Arvin, California

PUBLIC NOTICE

Public Hearing Notice

Public hearing will be held on March 18th, 2015 at 309 Campus Dr., Arvin CA 93203 regarding the Initial Urban Water Management Plan for Arvin Community Services District. For additional information or a copy of the draft plan, please contact Fernando Pantoja at 661-854-2127.

Publish *Arvin Tiller* March 4, 2015

The *ARVIN TILLER*
PO Box 1600
Shafter, CA 93263

Phone (661) 746-4942

PROOF OF PUBLICATION

(2015.5 C.C.P.)
(GENERAL FORM)

STATE OF CALIFORNIA
County of Kern } ss.

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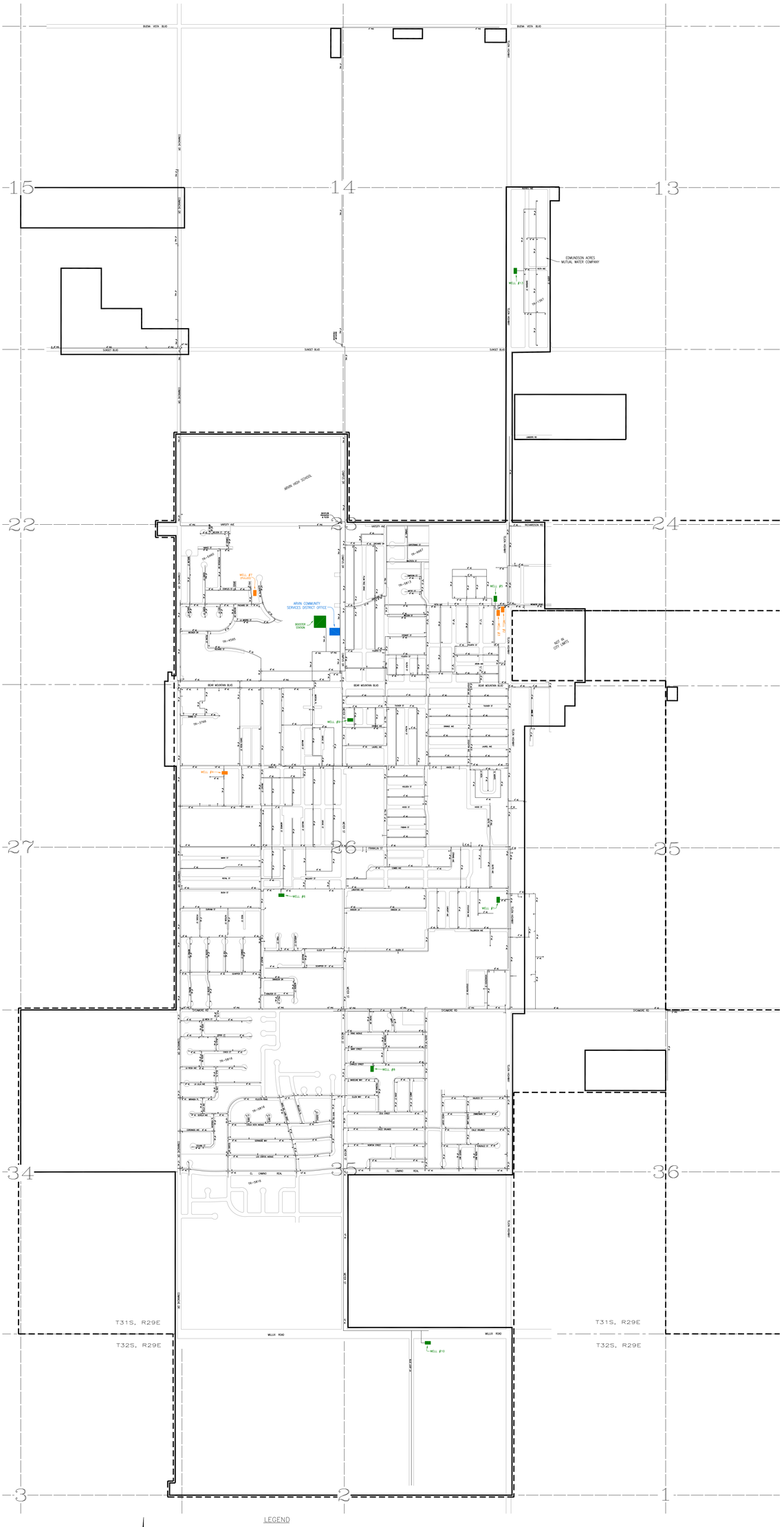

GRAPHIC SCALE

0 200 400 800

(IN FEET)

1 inch = 400 ft.

LEGEND

- ACTIVE WELLSITE/PUMP STATION
- ABANDONED / PULLED WELLSITE OR PUMP STATION
- WATER DISTRIBUTION PIPE (SIZE AS NOTED)
- GATE VALVE
- FIRE HYDRANT
- SERVICE AREA BOUNDARY
- ARVIN CITY LIMITS

DISTRIBUTION MAP
ARVIN COMMUNITY SERVICES DISTRICT
ARVIN, CALIFORNIA
SERVICE AREA MAP

CURRENT SERVICING AREA (8/10/12)

DEE JASPAR & ASSOCIATES, INC.
CIVIL • ENGINEERS
BAKERSFIELD, CALIFORNIA 93308
FAX (661) 393-2780

S:\Arvin Community Services District\General\Service Area Maps\Drawings\ACSD SA DISTRIBUTION MAP.dwg, 8/13/2013 9:43:51 PM, PDT

MINUTES OF THE SPECIAL MEETING OF
THE BOARD OF DIRECTORS
ARVIN COMMUNITY SERVICES DISTIST
March 18, 2015

The Board of Directors of the Arvin Community Services District duly met at a Special Board Meeting held on March 18, 2015 at the hour of 6:00 p.m. at 309 Campus Drive, Arvin, CA 93203.

The meeting was called to order by Board President Reyna at 6:00 p.m.

Directors Present: De Anda, Gallardo Alvarez, Reyna.

Directors Absent: Moreno.

Others Present: Fernando Pantoja – General Manager, Alan Peake - District Counsel, Dee Jaspar District Engineer, and Public.

Pledge of allegiance: The Pledge was led by Board President Reyna.

Director Moreno was present at 6:04 p.m.

1. Introduction of Arvin's New City Manager:

Alfonso Noyola introduced himself as Arvin's New City Manager. Mr. Noyola notified the Board that he has been the City Manager for two month and is looking forward to working with the community.

2. Public Hearing with Board to review and possibly adopt the Arvin Community Services District's Initial Urban Water Management Plan:

Board President Reyna opened up the for Public Hearing for the Arvin Community Services District Initial Urban Water Management Plan ("UWMP").
Legal Counsel notified the Board that every Urban Water Supplier that served more than 3,000 connections are required to adopt a UWMP. The UWMP must provide certain information to efficiently manage its water supply, looking for goals and to plan for the future.
The District Engineer presented the UWMP to the Board and summarized the plan to the Board. Mr. Jaspar notified that the plan was for 2010 and that the UWMP needs to be done every 5 years with the 2015 UWMP needing to be completed by June of 2016.
Board President Reyna closed the Public Hearing after no comments were made for the Arvin Community Services District Initial Urban Water Management Plan.

A motion was made by Director Alvarez, seconded by Director De Anda, to adopt the Arvin Community Services District's Initial Urban Water Management Plan subject to minor revisions from third parties with the approval of the Districts Engineer and the Manager was carried by the

following votes:

AYES: De Anda, Gallardo, Moreno, Alvarez, Reyna.
NOES: None.
ABSTAIN: None.
ABSENT: None.

3. Board to discuss and to set a budget for items to be provided at the 37th Annual Arvin Wildflower Festival on April 24-26th, 2015 and accept any donations related there to:

The General Manager provided information of items that could be given out to at the Festival and was seeking direction from the Board.
After a brief discussion, direction was given to the Board for the Manager to get more detail quotes on posters, magnets, pens and if a quote can be obtained on water conservation items.

4. Adjournment:

There being no further business to come before the Board during Open Session, motion to adjourn the meeting was made at 7:07 p.m. by a motion from Director Moreno, seconded by Director Alvarez, and was carried by the following votes:

AYES: De Anda, Gallardo, Moreno, Alvarez, Reyna.
NOES: None.
ABSTAIN: None.
ABSENT: None.

Submitted by:

Fernando Pantoja
General Manager