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WATER CONSERVATION PLAN
FOR THE
Canadian River Municipal Water Authority

Section I. WHOLESALE SERVICE AREA POPULATION AND CUSTOMER DATA

A. Population & Service Area Data

The Canadian River Municipal Water Authority (CRMWA) was created by the Texas State Legislature to provide a source of municipal and industrial water for its eleven member cities, which are Amarillo, Borger, Brownfield, Lamesa, Levelland, Lubbock, O'Donnell, Pampa, Plainview, Slaton, and Tahoka. The CRMWA is located in the Texas Panhandle and South Plains, a region of approximately 12,000 square miles with an estimated population of 657,000 people (Census Bureau estimate for 2017). Of this area, the CRMWA provides water to approximately 547,000 people via a 400+ mile aqueduct system. Figure 1 illustrates the CRMWA's service area and aqueduct system.

Figure 1 – The CRMWA's Aqueduct System and Service Area

1. Population served for previous five years (taken from US Census Bureau website –):

Year	Population
2017	546,659
2016	543,590
2015	539,615
2014	536,102
2013	531,123

*Estimated Population

2. Projected population for member cities in the following decades (taken from Texas Water Development Board website):

Year	Population
2020	567,807
2030	626,125
2040	684,172
2050	743,554
2060	804,625

B. Customer Data

1. Based on 2018 Water Allocations & Deliveries:

Wholesale Customer	Allocated Amount (acre-feet)	Delivered Amount (acre-feet)
Lubbock	32,981.62	24,257.97
Amarillo	36,152.69	30,083.44
Plainview	3,284.99	2,431.77
Pampa	3,2043.00	2,421.52
Borger	4,938.61	3,556.69
Levelland	2,483.10	1,764.43
Lamesa	1,939.31	1,125.26
Brownfield	1,956.22	1,460.14
Slaton	1,402.64	1,040.01
Tahoka	409.40	308.67
O'Donnell	247.42	126.29
Total	89,000.00	66,762

Section II. Water Use Data for Service Area

A. Water Delivery

In 2018, the CRMWA delivered 66,762 acre-feet of raw water. The priority in blending surface water and groundwater is to maximize usage from Lake Meredith while meeting state drinking water standards for water quality.

B. Water Accounting Data

1. Total amount of water (acre-feet) diverted at points of diversion(s) or produced from groundwater resources for previous five years for all water uses:

Year	**2014**	**2015**	**2016**	**2017**	**2018**
January	4,000	4,212	2,744	4,141	4,716
February	3,996	4,094	3,050	3,787	3,216
March	5,018	5,664	2,044	4,847	5,192
April	4,842	5,352	4,110	5,228	7,295
May	5,109	4,804	7,014	7,658	6,801
June	6,105	6,629	4,680	6,866	6,483
July	5,270	6,075	6,894	7,883	8,860
August	5,988	7,829	8,153	5,105	6,810
September	6,554	6,551	5,430	7,265	7,320
October	4,451	5,501	7,183	4,608	4,464
November	4,861	5,618	4,551	4,457	3,533
December	5,453	4,437	4,091	5,078	2,012
Total	**61,647**	**66,766**	**59,944**	**66,855**	**60,702**

2. Wholesale population served and total amount of water (acre-feet) diverted or produced from groundwater resources for **municipal use** for previous five years:

Year	Total Population Served	Total Annual Water Diverted for Municipal Use (acre-feet)
2013	531,123	63,786
2014	536,102	61,647
2015	539,615	66,766
2016	543,590	59,944
2017	546,659	66,855

Section III. Water Supply System Data

A. Water Supply Sources

1. Current water supplies available to the CRMWA and amounts authorized (acre-feet per year):

	Source	Amount Authorized
Surface Water	Lake Meredith	151,200
Groundwater	CRMWA Wellfield	69,000

CRMWA is authorized to deliver up to 151,200 acre-feet/year of lake water and has a system capacity of 69,000 acre-feet/year of groundwater. Studies performed in 1993 show Lake Meredith to have an estimated annual firm yield of 76,000 acre-feet, but more recent studies have shown the yield to be considerably less. Additionally, water quality may be the limiting factor in how much surface water can be blended with groundwater. Due to actual delivery capacity and limited demands of the member cities during winter use periods, CRMWA can only deliver approximately 105,000 acre-feet per year to its member cities, if Lake Meredith is at a sufficient depth and there are no limitations due to water quality.

Section IV. Conservation Goals

In order to conserve the total available water supply, CRMWA would make every effort to supply its Member Cities with as much surface water (renewable resource) as reasonably possible in order to conserve their groundwater reserves (essentially non-renewable). This, coupled with the Cities' Conservation Plans, will insure continued water availability to CRMWA Member Cities.

Section V: Quantified 5 & 10-Year Targets

The CRMWA is under a contractual obligation to supply its eleven member cities with their percentage of the CRMWA's total annual available supply. The CRMWA does not have the authority to regulate their usage with the exception of drought situations where the supply has been reduced proportionately. Additionally, each member city retains its own independent water supply from that of the CRMWA with varying supplies and demands. Each member city is responsible for creating and enforcing its own individual conservation plan where such targets and goals are identified. The CRMWA fully supports such targets and goals established by its' member cities.

A goal for maximum acceptable unaccounted-for water system wide is 5% or less. The CRMWA has had unaccounted water losses as high as 7% in the past. Through a regular program of meter calibration and careful watch of meter comparisons, the CRMWA has been able to lower this loss percentage for the past three years. The CRMWA will make every effort to achieve this goal in the current and future calendar years.

Section VI: Measurement of Diverted Water

To quantify the amount of water diverted from Lake Meredith (the CRMWA's current surface water source) and from the John C. Williams Wellfield (the groundwater source), weekly readings are taken from multiple locations throughout the aqueduct system. Larger meters are typically venturi-tube flow measurement devices, but sonic meters are also used in some locations. Smaller meters are typically propeller, turbine, or magnetic. The CRMWA reads all meters on the last Monday of each month. All large meters are read each Monday.

Section VII: Record Management

Weekly readings are entered into meter reading books that are kept for each calendar year. These readings are entered into an Excel worksheet and compared with previous month readings to get monthly and annual to date usage. These totals are saved to the network. All computer data recorded on the network are saved to an off-site archive on a regular basis.

Section VIII: Leak and Loss Control and Repair

The Excel worksheet referenced above includes a sheet called Loss Analysis. This section compares each main meter with all delivery meters downstream. Percentage and gallon loss or gain is calculated at multiple locations in this manner.

The Northern System is monitored 24 hours by personnel in the headquarters control room. CRMWA and Lubbock Treatment Plant personnel monitor the Southern System 24 hours. Any unusual tank level changes are reported immediately and appropriate action is taken.

Leaks that are found through the above methods or reported are repaired immediately by the CRMWA crews, unless the leak is small and the interruption of deliveries during peak demand periods dictates delay.

Section IX: Contract Provisions

The following provisions will be included in every wholesale water supply contract entered into or renewed after official adoption of this plan, including any contract extension:

1. Wholesale customer must develop and implement a water conservation plan or water conservation measures using the applicable elements of Chapter 288 of the Texas Administrative Code.

2. If wholesale customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have

water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of Chapter 288 of the Texas Administrative Code.

Section X: Regional Planning Group Coordination

The service area of the CRMWA is located within the Region A and Region O regional water planning areas, and the CRMWA has provided a copy of this water conservation plan to the Region A and Region O regional water planning organizations.

Section XI: Plan Adoption, Implementation and Enforcement

The CRMWA plans to adopt this plan on January 9, 2019 at its quarterly Board of Directors meeting. This plan will be supplied to each of the CRMWA's Member Cities, TCEQ, TWDB, Region A & O Water Planning Groups, and will be available on the CRMWA website (crmwa.com).

The CRMWA will limit each City to its allocated share by controlling quantities with supply valves. If a City exceeds its allocated share, service may be discontinued.

Section XII: Future Supply

The CRMWA is currently considering expansion of its capability to deliver water from its groundwater source of supply that will enhance its' water supply quantity. Due to limited aqueduct capacity from the groundwater source, CRMWA can only supply its member cites about half as much water as could be supplied from its surface water source. Even though the groundwater will add additional volume, the CRMWA will strive to conserve its' groundwater (essentially non-renewable) resources by using surface water (renewable) resources whenever it is available.

The Lake Meredith Salinity Control Project will enhance the water quality available from Lake Meredith. This will further the usefulness of Lake Meredith water and could allow fuller use of the surface water resource thereby conserving groundwater supplies.