


Alliance Water Resources, Inc. Operations Update

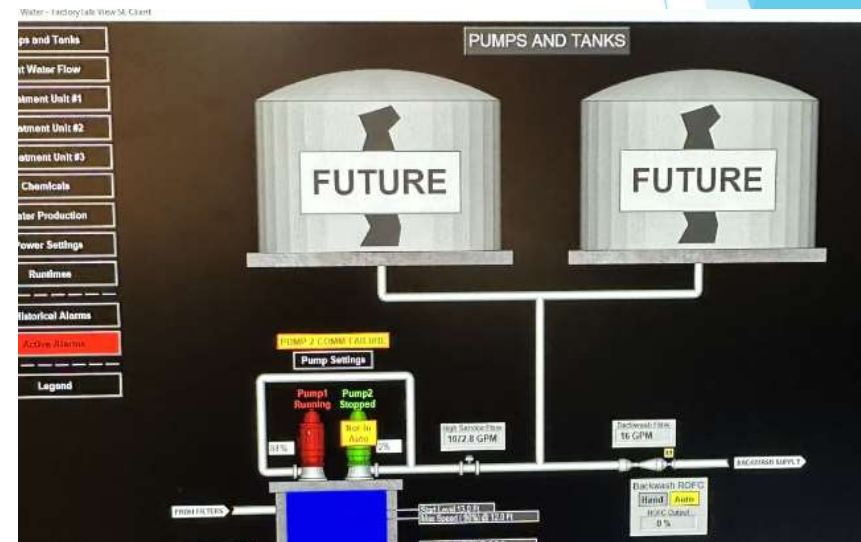
Martin County Water District

October 12, 2023

- 
- ▶ Current Issues and Updates
 - ▶ Water Loss Progress
 - ▶ Project Updates
 - ▶ Discussion/Questions

Backwash Efficiency Improvements

- ▶ Previous BW Standard Operating Procedure required taking an entire clarifier offline
- ▶ Disadvantages
 - ▶ Plant production temporarily reduced
 - ▶ Sedimentation basin refill
 - ▶ Risk loss of sludge blanket
 - ▶ 11 additional steps required by WTP Operator



Backwash Efficiency Improvements

Martin County Water District

Water Treatment Plant

Standard Operating Procedures

Backwashing/Filter Washing, V. 2

New Procedure 22 Steps

Purpose- Backwashing is used to clean filters and filter media. This ensures the water being produced and sent to our customers is of the highest quality.

Backwashing should be performed one filter at a time, with the goal of backwashing one filter per day. The unit should never be taken offline during a backwash, as one filter will continue without interruption.

Backwash Instructions

- 1.) Choose filter to be backwashed. Ideally, each filter reaches 200 hours of runtime before turbidity or head-loss reach a level that requires backwashing.
- 2.) Close the filter-influent mud valve above the filter to be washed. If needed, raise the filter-influent mud valve for the other filter on the unit you're backwashing to allow adequate flow to the filter. (Eg., if the mud valve for filter 5 is closed to prepare for backwash, the filter 6 mud valve may need to be opened more).
- 3.) Physically observe water levels on top of the filters to be backwashed as they drop. Once water levels are below the divide of the filter section and drain section, the drain valve may be opened.

(Filter #3 drain valve will need to be opened manually in the pit located in front of Unit #2- valves are marked with identifiers)

*While filter levels can be viewed on the computer, visually check them as they drop since readings may be inaccurate.

Martin County Water District

Water Treatment Plant

Standard Operating Procedures

Backwashing/Filter Washing

Old Procedure 33 Steps

Purpose- Backwashing is used to clean filters and filter media. This ensures the water being produced and sent to our customers is of the highest quality.

Backwash Instructions and Taking Units Offline

- 1.) Choose unit to be backwashed (Unit #2 @ 50 hours, Unit #3 @ 100 hours)
- 2.) Note flow settings for Raw Water Valve, and Flash Mix Valve 1 & 2
- 3.) Begin cutting Raw Water Valve flow in 15% increments until flow reaches half (15% on Raw Water Valve)
- 4.) Observe Raw Water Flow and Flash Mix Flow on Treatment Unit screen until flows stabilize
- 5.) Once flows have stabilized, cut flow to Flash Mix 1 or Flash Mix 2, depending on which unit will be backwashed, to 0%. BE SURE RAW WATER FLOW HAS DROPPED AND STABILIZED BEFORE SHUTTING OFF FLASH MIX TO EITHER UNIT
- 6.) Turn off pre-chlorine to the unit to be backwashed. (Downstairs in chemical room, will be labeled)
- 7.) Physically observe water levels on top of the filters to be backwashed as they drop. Once water levels are below the divide of the filter section and drain section, drain valves may be opened. (Filter #3 drain valve will need to be opened manually in the pit located in front of Unit #2- valves are marked with identifiers) *While filter levels can be viewed on the computer, visually check them as they drop since readings may be inaccurate.
- 8.) Continue to monitor filter levels as they drop and adjust flow through filters accordingly to

Backwash Efficiency Improvements

- ▶ Updated BW Standard Operating Procedure allows for uninterrupted water production
- ▶ Advantages
 - ▶ No unit downtime, minimal effect on production
 - ▶ Less steps = less likelihood of mistake
 - ▶ Adequate decant pit space

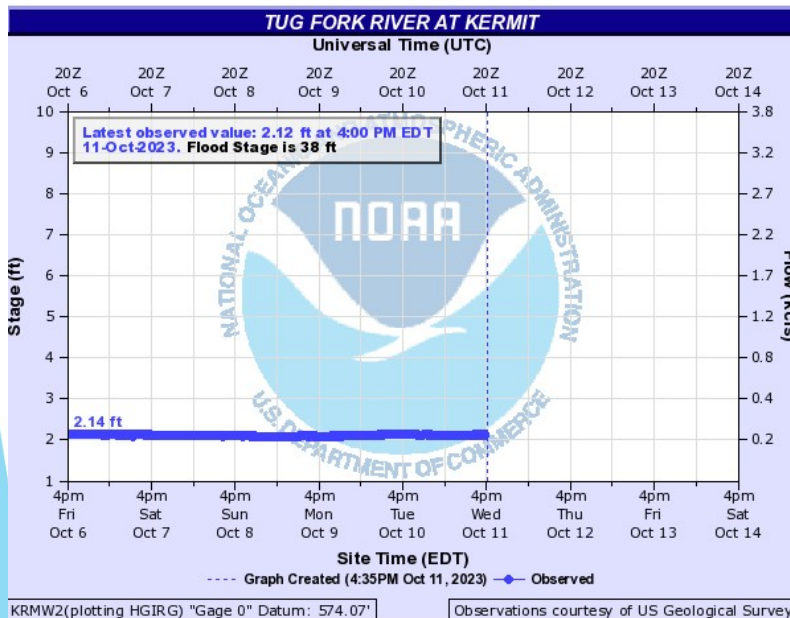
Tug Fork & Curtis Crum Reservoir River Issues

- ▶ District's 1.7 MGD electric pump was reinstalled in May and quickly suffered a VFD failure
- ▶ In 2023, two electric-powered and three diesel-powered high-head pumps have been rented to supply water to Curtis Crum Reservoir
- ▶ VFD for 1.7 MGD electric-powered pump has arrived and is pending installation



Tug Fork & Curtis Crum Reservoir River Issues

- ▶ Tug Fork River at Kermit NOAA gauge reached its lowest level since 7/20/1999 (2.08')
- ▶ WTP was relying on 1 of 3 intake screens to supply water to District



Tug Fork & Curtis Crum Reservoir River Issues

- ▶ Current diesel-powered rental pump has been supplying the reservoir with 2.75 MGD since Oct. 2nd
- ▶ Raw water influent to WTP has increased by nearly 0.1 MGD since second intake screen became partially submerged
- ▶ Water loss progress allowed service to continue to all District customers with no interruption

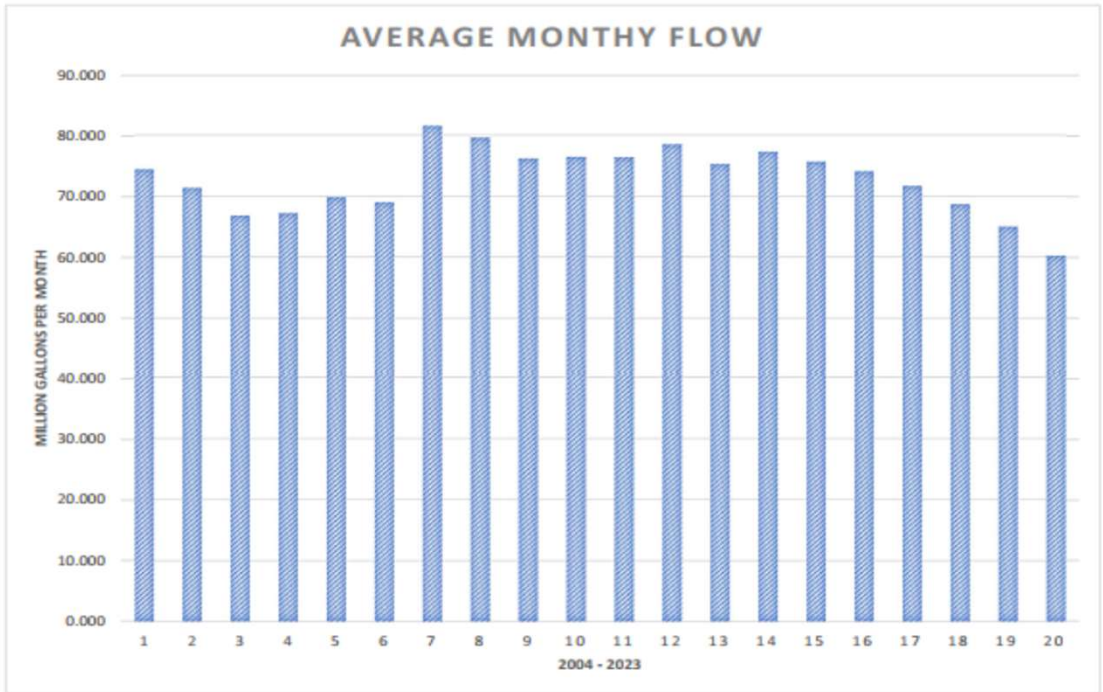


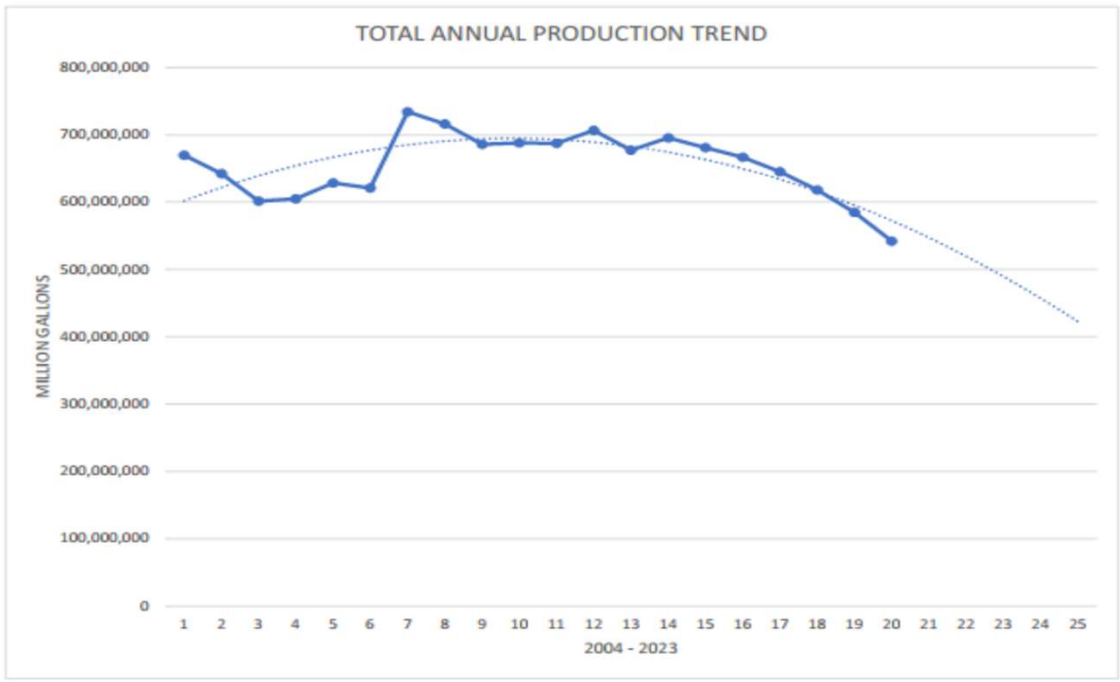
Master Meter Replacement

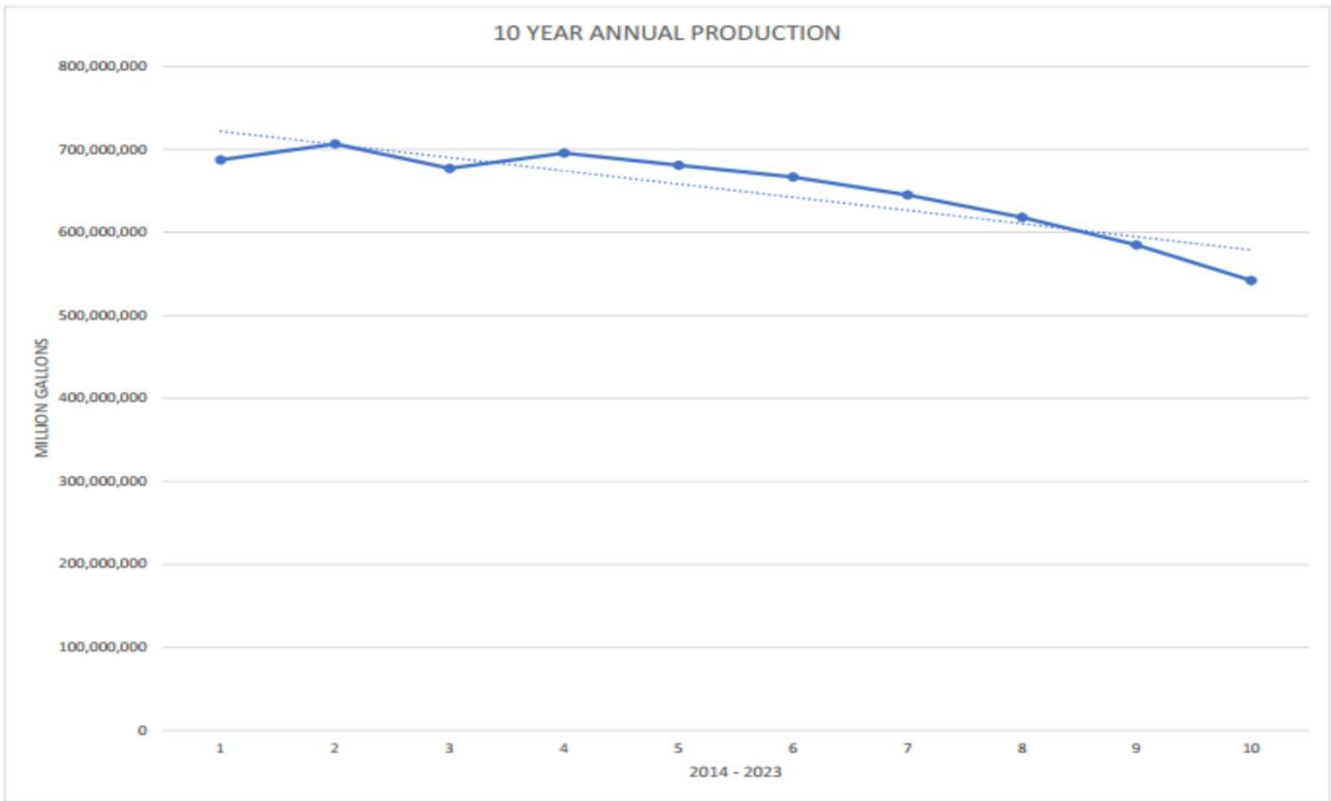
- ▶ Crucial for understanding and identifying consumption and water loss trends
- ▶ 2032 master meter replacement eliminated major hydraulic issue and helped better understand water loss in pressure zone
- ▶ Long Branch master meter replacement helped identify loss on dead-end section of distribution system
- ▶ 40 East master meter replacement brought better understanding of loss in subsequent pressure zones

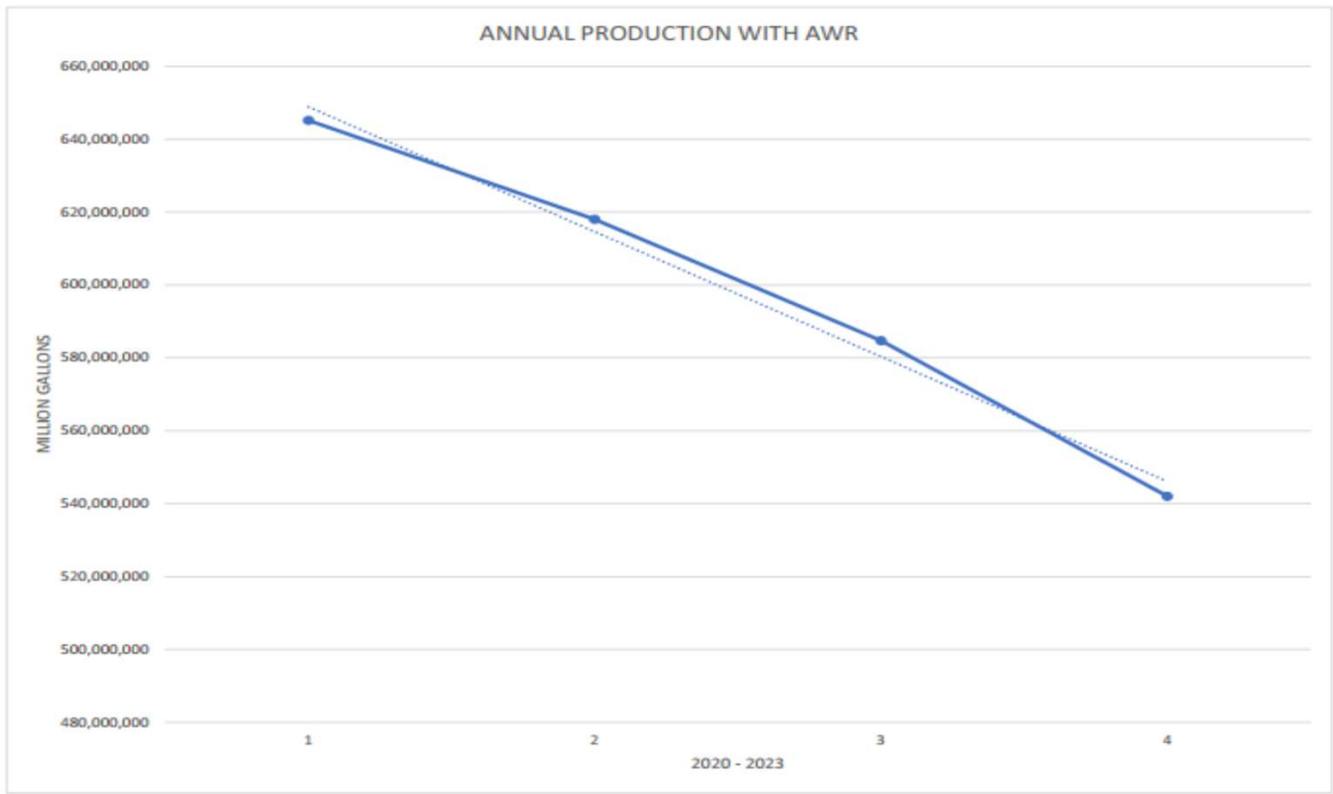


	MIN GPD	MAX GPD	MIN MONTHLY FLOW	MAX MONTHLY FLOW	TOTAL ANNUAL FLOW	AVG
2004	1.46	1.990	51,719,700	60,280,000	669,548,800	74.394
2005	0.819	1.948	51,171,000	58,099,000	642,168,000	71.352
2006	1.418	1.849	47,563,000	52,013,000	601,335,000	66.815
2007	1.218	1.958	48,511,000	53,017,000	604,962,000	67.218
2008	1.415	1.865	49,653,000	54,539,000	628,504,000	69.834
2009	0.687	1.902	47,448,000	55,241,000	620,896,500	68.989
2010	1.275	2.217	51,126,000	67,429,000	734,334,000	81.593
2011	1.327	2.117	55,588,000	69,282,000	716,222,000	79.580
2012	0.416	2.039	53,011,000	61,876,000	685,765,000	76.196
2013	1.178	2.012	53,988,000	59,649,000	688,024,000	76.447
2014	1.183	2.075	53,363,000	61,153,000	687,412,000	76.379
2015	1.251	2.238	55,721,000	62,189,000	706,633,000	78.515
2016	1.485	2.065	54,195,000	61,026,000	677,164,000	75.240
2017	1.534	2.155	52,618,000	62,634,000	695,581,000	77.287
2018	0.998	2.027	52,875,000	61,406,000	680,970,000	75.663
2019	1.393	2.007	51,959,000	59,636,000	666,648,000	74.072
2020	1.376	1.908	49,852,000	55,159,000	645,180,000	71.687
2021	0.703	1.922	48,544,000	57,957,000	618,015,000	68.668
2022	0.894	1.801	47,331,000	54,843,000	584,756,000	64.973
2023	1.189	1.738	41,710,000	50,762,000	542,038,000	60.226









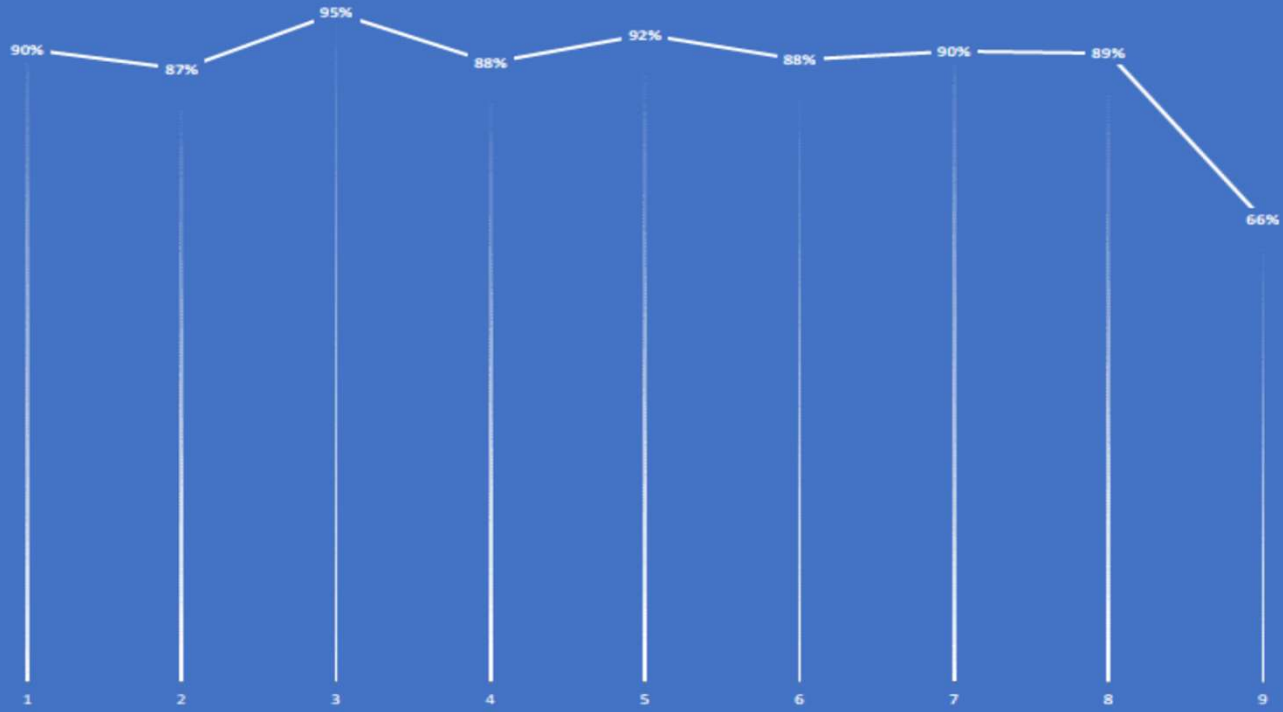
DM1 (INEZ)	MONTHLY PRODUCTION	WEEKLY PRODUCTION	DAILY PRODUCTION	CONSUMPTION	MONTHLY GALLONS LOST	WATER LOSS
2022						
January	25,966,249	6,491,562	927,366	2,332,110	23,634,139	91%
February	24,895,448	6,223,862	889,123	2,338,910	22,556,538	91%
March	30,689,073	6,137,815	876,831	2,711,060	27,978,013	91%
April	16,522,321	4,130,580	590,083	2,245,150	14,277,171	86%
May	14,662,265	3,665,566	523,652	2,424,790	12,237,475	83%
June	22,845,509	4,569,102	652,729	2,334,860	20,510,649	90%
July	4,661,225	1,165,306	166,472	2,460,390	2,200,835	47%
August	33,948,762	8,487,191	1,212,456	2,496,590	31,452,172	93%
September	25,402,696	6,350,674	907,239	2,674,510	22,728,186	89%
October	21,842,604	5,460,651	780,093	1,887,770	19,954,834	91%
November	25,561,239	5,112,248	730,321	2,157,400	23,403,839	92%
December	5,654,229	1,413,557	201,937	2,316,650	3,337,579	59%
2023						
January	32,847,510	8,211,878	1,173,125	3,347,040	29,500,470	90%
February	15,083,045	3,770,761	538,680	1,963,240	13,119,805	87%
March	33,664,010	6,732,802	961,829	1,696,320	31,967,690	95%
April	22,856,303	5,714,951	816,293	2,763,950	20,092,253	88%
May	27,966,073	6,991,219	829,430	2,353,550	26,676,495	92%
June	10,558,846	2,513,961	820,726	2,691,270	20,289,060	88%
July	21,966,073	5,498,219	848,369	2,489,850	21,264,481	90%
August	27,966,073	6,991,219	998,603	3,018,720	24,942,155	89%
September	10,558,846	2,513,961	359,137	3,461,520	6,594,326	66%
October		-	-		-	#DIV/0!
November		-	-		-	#DIV/0!
December		-	-		-	#DIV/0!
Average 2023	23,317,361	5,277,745	753,964	2,310,740	20,196,639	86%

NEW METER INSTALLED AT 40 EAST BOOSTER STATION

GPM LOSS
152.65

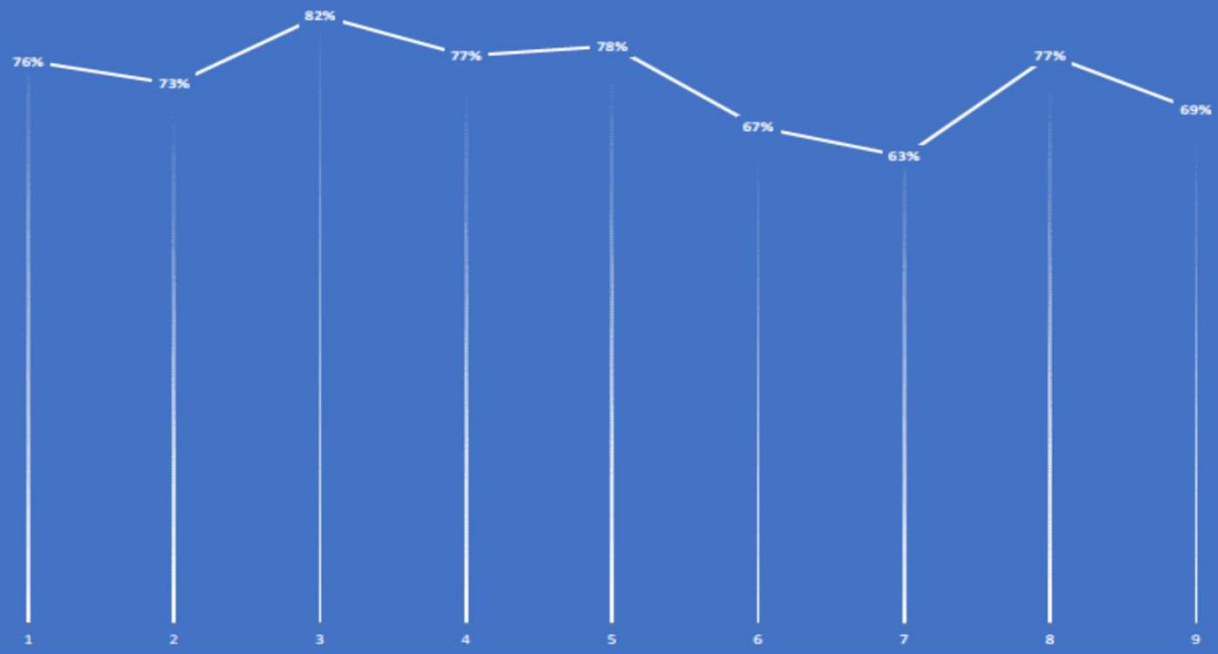
Notes

INEZ WATER LOSS



DM2 (COLDWATER)	MONTHLY PRODUCTION	WEEKLY PRODUCTION	DAILY PRODUCTION	CONSUMPTION	MONTHLY GALLONS LOST	WATER LOSS	GPM LOSS
2022							
January	3,558,430	889,608	127,087	992,660	2,565,770	72%	59.39
February	3,213,320	803,330	114,761	747,550	2,465,770	77%	57.08
March	3,664,280	732,856	104,694	822,490	2,841,790	78%	65.78
April	2,967,560	741,890	105,984	1,023,960	1,943,600	65%	44.99
May	2,901,580	725,395	103,628	887,920	2,013,660	69%	46.61
June	3,742,894	748,579	106,940	941,090	2,801,804	75%	64.86
July	2,370,880	592,720	84,674	1,108,200	1,262,680	53%	29.23
August	5,929,100	1,482,275	211,754	950,660	4,978,440	84%	115.24
September	3,041,970	760,493	108,642	1,291,420	1,750,550	58%	40.52
October	3,012,390	753,098	107,585	835,850	2,176,540	72%	50.38
November	2,937,610	587,522	83,932	880,700	2,056,910	70%	47.61
December	2,892,650	723,163	103,309	976,170	1,916,480	66%	44.36
2023							
January	3,532,950	883,238	126,177	853,670	2,679,280	76%	62.02
February	3,131,540	782,885	111,841	853,670	2,277,870	73%	52.73
March	3,515,880	703,176	100,454	633,840	2,882,040	82%	66.71
April	3,173,370	793,343	113,335	743,503	2,429,867	77%	56.25
May	3,887,050	777,410	111,059	860,340	3,026,710	78%	70.06
June	2,903,880	725,970	103,710	961,280	1,942,600	67%	44.97
July	2,967,850	741,963	105,995	1,099,120	1,868,730	63%	43.26
August	4,202,380	1,050,595	150,085	983,940	3,218,440	77%	74.50
September	3,480,420	870,105	124,301	1,072,440	2,407,980	69%	55.74
October		-	-		-	#DIV/0!	
November		-	-		-	#DIV/0!	
December		-	-		-	#DIV/0!	
Average 2023	3,421,702	814,298	116,328 Notes	895,756	2,540,692	0.734023053	58.47

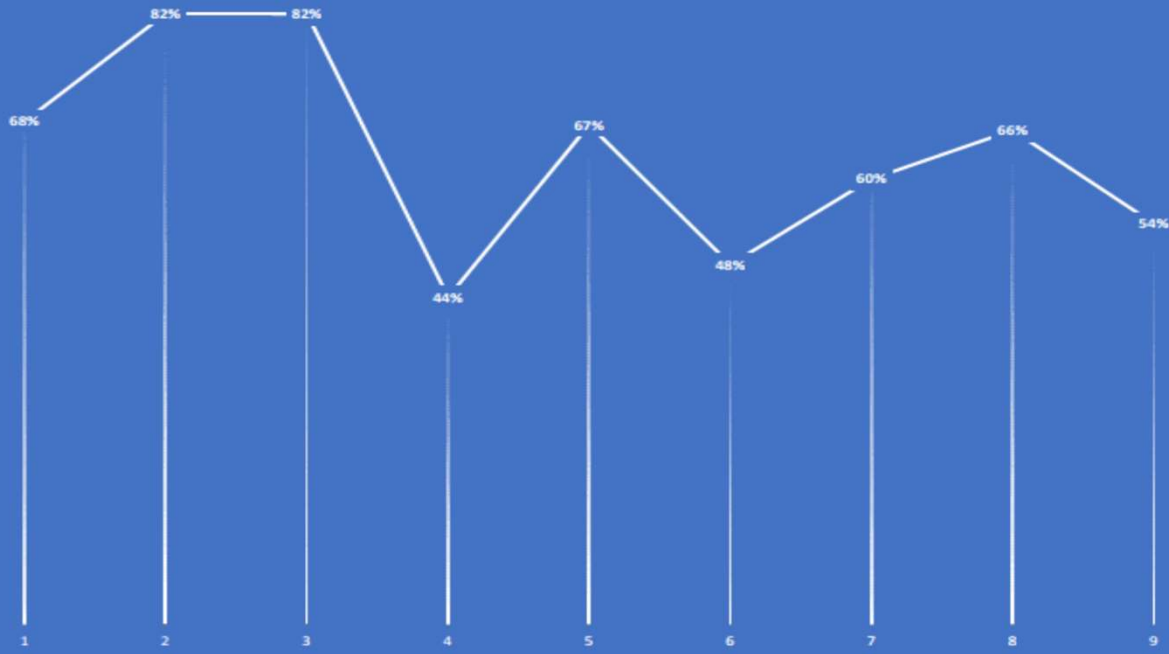
COLDWATER WATER LOSS



DM4 (Turkey Creek)	MONTHLY PRODUCTION	WEEKLY PRODUCTION	DAILY PRODUCTION	CONSUMPTION	MONTHLY GALLONS LOST	WATER LOSS	GPM LOSS
2022							
January	3,181,171	795,293	113,613	864,540	2,316,631	73%	53.63
February	3,040,382	760,096	108,585	897,510	2,142,872	70%	49.60
March	3,481,597	696,319	99,474	616,740	2,864,857	82%	66.32
April	3,483,669	870,917	124,417	665,270	2,818,399	81%	65.24
May	3,055,865	763,966	109,138	825,370	2,230,495	73%	51.63
June	5,040,627	1,008,125	144,018	731,380	4,309,247	85%	99.75
July	3,377,925	844,481	120,640	991,430	2,386,495	71%	55.24
August	6,093,688	1,523,422	217,632	691,520	5,402,168	89%	125.05
September	3,307,924	826,981	118,140	712,590	2,595,334	78%	60.08
October	3,218,456	804,614	114,945	508,920	2,709,536	84%	62.72
November	3,226,741	645,348	92,193	751,590	2,475,151	77%	57.30
December	3,542,191	885,548	126,507	665,170	2,877,021	81%	66.60
Average 2022	3,670,853	868,759	124,108	743,503	2,927,351	79%	67.76
2023							
January	2,950,560	737,640	105,377	957,530	1,993,030	68%	46.13
February	3,048,035	762,009	108,858	547,450	2,500,585	82%	57.88
March	3,400,406	680,081	97,154	613,010	2,787,396	82%	64.52
April	1,325,893	331,473	47,353	743,503	582,390	44%	13.48
May	2,041,159	408,232	58,319	672,440	1,368,719	67%	31.68
June	1,488,400	372,100	53,157	769,230	719,170	48%	16.65
July	1,714,389	428,597	61,228	689,330	1,025,059	60%	23.73
August	2,046,265	511,566	73,081	689,060	1,357,205	66%	31.42
September	1,620,874	405,219	57,888	748,940	871,934	54%	20.18
October	-	-	-	-	-	#DIV/0!	
November	-	-	-	-	-	#DIV/0!	
December	-	-	-	-	-	#DIV/0!	
Average 2023	2,181,776	515,213	73,602	714,499	1,467,276	63%	33.96

Notes

TURKEY WATER LOSS



DMS (40 EAST)	MONTHLY PRODUCTION	WEEKLY PRODUCTION	DAILY PRODUCTION	CONSUMPTION	MONTHLY GALLONS LOST	WATER LOSS	GPM LOSS
2022							
January	(326,000)	(81,500)	(11,643)	137,680	(463,680)	142%	
February	(1,673,400)	(418,350)	(59,764)	79,950	(1,753,350)	105%	
March	(4,521,600)	(904,320)	(129,189)	246,670	(4,768,270)	105%	
April	(1,942,800)	(485,700)	(69,386)	195,550	(2,138,350)	110%	
May	3,904,071	976,018	139,431	169,370	3,734,701	96%	
June	4,520,050	904,010	129,144	168,040	4,352,010	96%	
July	(828,780)	(207,195)	(29,599)	190,980	(1,019,760)	123%	
August	3,787,630	946,908	135,273	147,480	3,640,150	96%	
September	(2,407,060)	(601,765)	(85,966)	208,330	(2,615,390)	109%	
October	(1,115,920)	(278,980)	(39,854)	206,530	(1,322,450)	119%	
November	(2,841,050)	(568,210)	(81,173)	138,460	(2,979,510)	105%	
December	(5,216,800)	(1,304,200)	(186,314)	161,430	(5,378,230)	103%	
2023							
January	(6,036,400)	(1,509,100)	(215,586)	185,280	(6,221,680)	103%	
February	(97,000)	(24,250)	(3,464)	131,010	(228,010)	235%	
March	(1,460,700)	(292,140)	(41,734)	100,150	(1,560,850)	107%	
April	(53,600)	(13,400)	(1,914)	189,130	(242,730)	453%	
May				146,160	(1,074,360)	116%	
June				200,070	(1,752,470)	113%	
July	(9,444,500)	(2,361,125)	(337,304)	154,860	(9,599,360)	102%	
August	(42,000)	(10,500)	(1,500)	196,650	(238,650)	568%	
September	3,054,099	763,525	109,075	157,090	2,897,009	95%	67.06
October		-	-		-	#DIV/0!	
November		-	-		-	#DIV/0!	
December		-	-		-	#DIV/0!	
Average 2023	3,054,099	763,525	109,075	157,090	2,897,009	95%	67.06

Notes

DM21 (OLD ROUTE 3)	MONTHLY PRODUCTION	WEEKLY PRODUCTION	DAILY PRODUCTION	CONSUMPTION	MONTHLY GALLONS LOST	WATER LOSS	GPM LOSS
2022							
January	4,168,883	1,042,221	148,889	848,120	3,320,763	80%	76.9
February	3,957,392	989,348	141,335	773,100	3,184,292	80%	73.7
March	4,072,174	814,435	116,348	625,240	3,446,934	85%	79.8
April	2,841,821	710,455	101,494	763,240	2,078,581	73%	48.1
May	2,274,713	568,678	81,240	823,510	1,451,203	64%	33.6
June	3,947,193	789,439	112,777	761,100	3,186,093	81%	73.8
July	2,283,381	570,845	81,549	792,630	1,490,751	65%	34.5
August	5,561,563	1,390,391	198,627	744,500	4,817,063	87%	111.5
September	3,552,270	888,068	126,867	1,069,760	2,482,510	70%	57.5
October	3,133,580	783,395	111,914	505,470	2,628,110	84%	60.8
November	3,194,452	638,890	91,270	622,170	2,572,282	81%	59.5
December	3,254,686	813,672	116,239	703,570	2,551,116	78%	59.1
2023							
January	3,457,715	864,429	123,490	989,570	2,468,145	71%	57.1
February	3,847,733	961,933	137,419	532,760	3,314,973	86%	76.7
March	5,029,887	1,005,977	143,711	548,130	4,481,757	89%	103.7
April	3,744,443	936,111	133,730	683,560	3,060,883	82%	70.9
May	3,779,004	755,801	107,972	616,190	3,162,814	84%	73.2
June	2,046,936	511,734	73,105	756,900	1,290,036	63%	29.9
July	2,305,515	576,379	82,340	822,230	1,483,285	64%	34.3
August	2,562,463	640,616	91,517	685,240	1,877,223	73%	43.5
September	2,081,456	520,364	74,338	788,580	1,292,876	62%	29.9
October	-	-	-	-	-	#DIV/0!	
November	-	-	-	-	-	#DIV/0!	
December	-	-	-	-	-	#DIV/0!	
Average 2023	3,206,128	752,594	107,513	713,684	2,492,444	75%	57.7

Notes

OLD ROUTE 3 WATER LOSS



Water System Improvements Project Status Update

Martin County Water District

October 12, 2023



Projects Under Construction

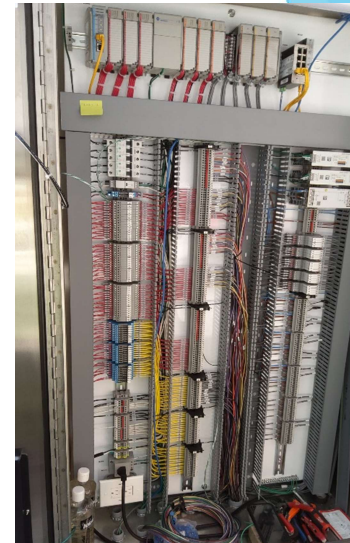
WTP/RWI Improvements

► Work Last Quarter:

- Completed testing of the Generator under no & full load conditions.
- Completed sealing and welding for Treatment Unit 1.
- Installed Unit 1 Tube Settlers.

► Upcoming Work:

- 10/09-10/16 Complete Unit 1 Chlorination.
- 10/16-10/20 Complete Unit 1 Start-Up.
Tie In HVAC Controls to PLC.
- 10/23-10/27 Run Unit 1 for One Week.
- 10/30-11/03 Drain & Clean Unit 2.
- 11/06-11/10 Drain & Clean Unit 3.
- 11/13-12/01 Sandblast Unit 3.
- 12/04-12/08 Recoat, Repaint & Replace Unit 3 Drive Units.
Install Unit 3 Tube Settlers
- 12/11-12/15 Complete Unit 3 Start-Up.



Project to Utilize Remaining ARC Funds

Kentucky 292 South Pumping Station & 292 South Tank Telemetry

► Need for the Project:

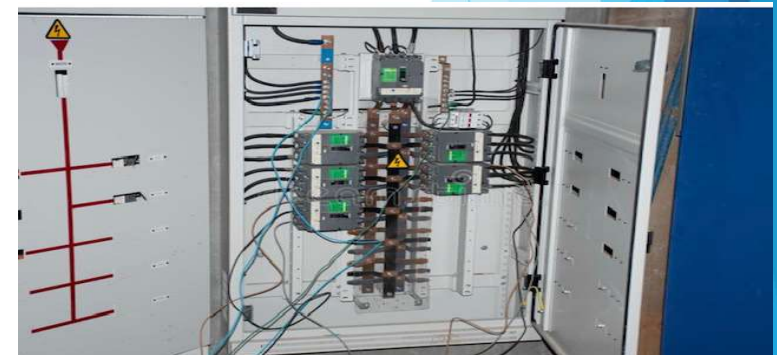
- ARC project has \$85,832 in unspent funds.
- Neither the Pumping Station nor Water Storage Tank it pumps to have operating telemetry.

► Major Items of Work:

- A solar powered tank site PLC-RTU with panel, coax & antenna
- A pump station PLC-RTU with panel, coax & antenna
- Level sensor for monitoring tank level
- Mechanical/Electrical Improvements to the Pumping Station

► Project Status:

- Project is out for Bidding.



Designed Projects

Mainline, Service Line, Meter Replacement In the Warfield Area

▶ Project will Replace the following in the Warfield Area:

- Existing Mainline
- Existing Meters & Service Line
- Existing Valves & Hydrants

▶ Status:

- Permits and Approvals (DOW, KYTC, Floodplain Management, Corps of Engineers, AML, etc.) required for construction were previously obtained.
- \$1.5M in Additional Project Funding through the Corps of Engineers is now available. Project is ready for rebid. Plans and specifications have been sent to the Corps of Engineers with a request to readvertise the project.



Projects in Design

USP Big Sandy, Eastern Kentucky Business Park & Big Sandy Airport Water Improvements

▶ Components Remaining in Project from Original Scope

- Upgrade of the Existing Davella Pump Station. Construct Master Meter & Booster Chlorination.

▶ Proposed Revised Scope Components:

- Relocate the proposed Pump Station so that it replaces the existing Otto Brown Station. This station is beyond its useful life and subject to confined space constraints.
- Replace existing waterline in the vicinity of the Otto Brown Station that is subject to leaks.
- Provide Modifications to the Middle Fork Tank rather than construct a new tank.

▶ Project Status:

- All water lines have been designed. Pump Station designs are being finalized. Plans and Specifications are being sent for Environmental Review this month.



High School Pump Station/Tank Piping Modifications

▶ Construct Valve Vault and Check Valve

- Install Valve Vault and Check Valve to allow District to feed additional service areas with the High School Water Storage Tank.

▶ Project Status

- Design will be reviewed by the District and Constructed when Funding is Available.

FEMA Backup Generator Project

▶ Project includes the following:

- One Generator to operate 750-HP VFD Controlled RWI Pump
- Two Generators to operate 60-HP VFD Controlled Pumping Stations

▶ Project Status:

- The project has been approved by FEMA with a budget of \$1,320,000.
- Project design is continuing.



KYTC Utility Projects Awaiting Funding

KYTC Projects

▶ Hunters Lane Utility Relocation:

- Relocation of existing waterline to facilitate construction of a new bridge for the KYTC Bridging Kentucky Program

▶ KY 908 Guardrail:

- Relocation of existing 14” waterline along Route 908 to facilitate installation of new guardrail.

▶ Sester Branch Utility Relocation:

- Relocation of existing waterline to facilitate construction of a new bridge. Documents have been reviewed by KYTC.

▶ Kentucky 40 at Buck Creek :

- Relocation of existing waterline to facilitate construction of new bridges/culverts. Met onsite with KYTC on September 20th. Scope of work being finalized with KYTC.

▶ Kentucky 292 :

- Relocation of existing waterline to facilitate construction of new bridges/culverts. Met onsite with KYTC on September 20th. Scope of work being finalized with KYTC.



Projects in Planning

Opinions of Probable Project Cost Prepared

- ▶ 40 East Water Improvement Project
- ▶ Coldwater Water Improvement Project
- ▶ Old Route 3 Water Improvement Project
- ▶ Water Treatment Plant to Turkey Tank Water Improvement Project
- ▶ Meter Replacement Project
- ▶ Turkey Water Storage Tank Rehabilitation/Painting
- ▶ Spicy Mountain Booster Pump Station and Water Line Extension Project
- ▶ Inez Water Line & Valve Replacement
- ▶ Distribution Building & Pipe Yard
- ▶ 292 Booster Station & Water Line Replacement
- ▶ Big Elk Water Line Replacement & Booster Station Rehabilitation



Opinions of Probable Project Cost Prepared

- ▶ Buffalo Horn Water Line Replacement & Booster Station Rehabilitation
- ▶ 645 Water Line Replacement & Booster Station Rehabilitation
- ▶ Wolf Creek/Pigeon Roost Water Line Replacement
- ▶ Meathouse Water Line Replacement & Booster Pump Station Rehabilitation
- ▶ Meter Replacement Project
- ▶ Hode Water Line Replacement
- ▶ Cassell Branch Water Line Replacement & Booster Pump Station Rehabilitation
- ▶ Creek Crossing Replacement
- ▶ Valve Insertion
- ▶ Water Plant High Service Pump Replacement
- ▶ Big Lick Water Line Replacement & Booster Pump Station Rehabilitation
- ▶ Peter Cave Water Line Replacement & Booster Pump Station Rehabilitation





Questions?