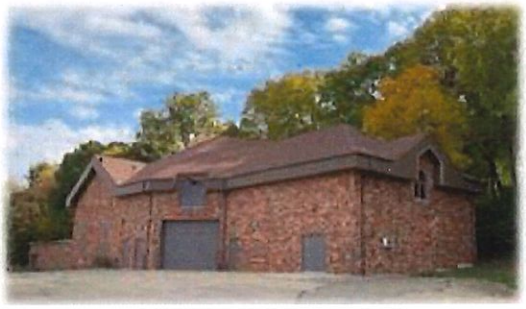
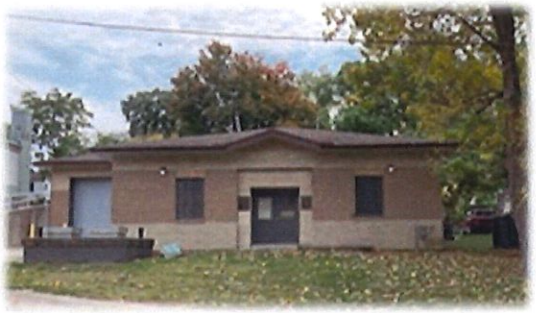
WATER PRODUCTION ANNUAL REPORT

2023





December 1, 2024

City of Oakwood
Prepared By: Scott Loper

Scott Loper, Water Plant Superintendent

TABLE OF CONTENTS

INDEX

TABLES

CHARTS

I. INTRODUCTION/BRIEF HISTORY

This report provides a summary of the operations of the city of Oakwood water system for the year 2023. It includes the following items:

- Water Pumpage Statistics
- Water Monitoring and Testing (OEPA Compliance)
- Water System Maintenance
- Budget Summary

Prior to 1954, the city of Oakwood purchased all of its water from outside sources, primarily the city of Dayton. At that time, the Ohio Department of Health regulated public water systems and the rules and regulations were fairly limited, thus the price of water was relatively low. In 1954 Oakwood drilled two wells at 120 Springhouse Road. This site became known as the "Springhouse Wellfield." This was the beginning of Oakwood's quest to become water independent.

From 1954 to 1965, Oakwood relied on two wells for its water supply. This method proved so successful that three additional wells were drilled at the Springhouse property to greater depths, enabling sustained, higher-volume pumping. As a result, the original two wells were decommissioned. The operation of Wells 1, 2, and 3 significantly increased water production and reduced Oakwood's dependence on Dayton's water supply. To ensure the water was safe for consumption, it was chlorinated to eliminate any potential bacterial contamination.

In 1978, Oakwood developed a second well field at the southern end of Firwood Drive, off Irving Avenue in Dayton, known as the Firwood Wellfield. Between 1978 and 1988, three production wells (#4, 5 & 6) were drilled at this site, demonstrating abundant groundwater resources. In 1985, Oakwood purchased land on the north side of Irving Avenue for a soccer field, and in 1986, Well number 7 was drilled adjacent to the field, establishing the Soccer Field Wellfield.

Prior to using water from the Firwood Wellfield, the Ohio EPA required the City to construct an Iron and Manganese Removal Plant due to elevated levels of iron and manganese in Well #5. The plant was constructed in 1980 at the 210 Shafor Boulevard Service Yard. This plant also housed the chlorination system for Wells #4, 5, 6 & 7.

In 1987, Oakwood began exploring the possibility of softening the city's water. Plans for a water softening plant at 210 Shafor Boulevard were completed in 1988, and construction was finished in 1989. A second plant at 120 Springhouse Road was planned in 1991 and built in 1992. Both plants use the ion exchange softening process, which is also common in home water softeners. This system removes hardness, primarily calcium and magnesium. Periodically, the softening units require backwashing and regeneration of the resin bed filters.

In 2004, Oakwood drilled Well #8 in the Firwood Wellfield to enhance the city's water independence.

The reports and tables in Sections III & IV provide monthly and yearly totals of the city of Oakwood's 2023 water pumpage. They include monthly and yearly totals for all wells, the Shafor plant, Springhouse plant and water purchased from outside sources (i.e., city of Dayton and Montgomery County). In 2023, Oakwood was able to provide 100 % of its own water for daily usage, even for fire responses.

II. WATER MONITORING AND TESTING (OEPA COMPLIANCE)

The following samples were collected at the entry points of the water system at the 120 Springhouse and the 210 Shafor Water Treatment Plants as required by the Ohio EPA:

- Nitrates, collected August 10, 2023
- Total Trihalomethanes (TTHM), collected August 9, 2023
- Total Haloacetic Acids (HAA5), collected August 9, 2023
- Synthetic organic compounds, collected August 10, 2023
- Samples for Lead and Copper were collected from 20 Oakwood properties between June 11 and September 16, 2023.

All samples tested as required by the Ohio EPA and under the 2023 Ohio EPA Chemical Monitoring schedule were in compliance with the Safe Drinking Water Act. Table 1 on page 5 lists the results of the lead and copper sampling program. Table 2 on pages 6 – 7 compares Oakwood's water with EPA standards. All results are from the most recent samples taken. Some samples are only required to be taken every three years. The monthly routine sampling consists of the following tests:

- ***10 bacteriological samples per month from Distribution System.***
- ***2 sodium samples per month from Distribution System.***
- ***1 sodium sample per month from each Plant.***
- ***1 iron and manganese sample per week from each Plant.***
- ***Hardness samples daily from each Plant and Distribution System.***
- ***Free and total chlorine samples daily from each Plant as well as from the Distribution System.***
- ***1 chloride and pH sample per month from each Plant (NPDES Stormwater Permit requirement).***
- ***1 Total Dissolved Solids sample per month from each Plant (NPDES Stormwater Permit requirement).***

General test results are as follows:

- **All 120 bacteriological samples tested negative for coliform bacteria.**
- **Raw water sodium averaged 105 mg/L at 210 Shafor, up from 100 mg/L in 2022; and 138 mg/L at 120 Springhouse, down from 153 mg/L in 2022.**
- **System water sodium averaged 293 mg/L, down from 338 mg/L in 2022.**
- **Iron at both plant effluents averaged <0.1 mg/L.**
- **Manganese at both plant effluents averaged <0.01 mg/L.**
- **System water hardness at 210 Shafor averaged 174 mg/L (10.2 GPG).**
- **System water hardness at 120 Springhouse averaged 165 mg/L (9.6 GPG).**

TABLE 1
OAKWOOD 2023 LEAD & COPPER TESTING RESULTS

EPA Copper Action Level (ug/L)		1,300
	SAMPLE NUMBER	**COPPER RESULTS (ug/L)**
1	LC228	28
2	LC234	43
3	LC201	62
4	LC221	69
5	LC223	76
6	LC231	76
7	LC230	81
8	LC210	99
9	LC226	100
10	LC222	110
11	LC209	140
12	LC225	150
13	LC232	150
14	LC218	160
15	LC235	160
16	LC233	200
17	LC213	200
18	LC203	220
19	LC205	270
20	LC236	340

EPA Lead Action Level (ug/L)		15.0
	SAMPLE NUMBER	**LEAD RESULTS (ug/L)**
1	LC201	<2
2	LC203	<2
3	LC205	<2
4	LC209	<2
5	LC210	<2
6	LC221	<2
7	LC222	<2
8	LC225	<2
9	LC226	<2
10	LC232	<2
11	LC234	<2
12	LC223	2.1
13	LC228	2.1
14	LC233	3.0
15	LC236	3.0
16	LC235	3.2
17	LC218	3.4
18	LC213	3.9
19	LC230	4.2
20	LC231	4.5

ND: Not-Detected

To be in compliance with the OEPA Lead & Copper Rule, sample results must be below the set action level for lead and copper, as listed in the table above, at the 90th percentile. Oakwood's 90th percentile is highlighted in light blue above.

TABLE 2
OAKWOOD 2023 WATER TESTING RESULTS

CONTAMINANT	OAKWOOD'S WATER		OEPA	DATE COLLECTED
	Shafor	Springhouse	MCL	
VOLATILE ORGANIC COMPOUNDS	ug/L	ug/L	ug/L	
Benzene	<0.5	<0.5	5.0	8/24/21
Carbon tetrachloride	<0.5	<0.5	5.0	8/24/21
1,1-Dichloroethane	<0.5	<0.5	7.0	8/24/21
1,2-Dichloroethane	<0.5	<0.5	5.0	8/24/21
cis-1,2-Dichloroethene	<0.5	<0.5	70.0	8/24/21
Dichloromethane	<0.5	<0.5	5.0	8/24/21
1,2-Dichloropropane	<0.5	<0.5	5.0	8/24/21
Ethylbenzene	<0.5	<0.5	700.0	8/24/21
Styrene	<0.5	<0.5	100.0	8/24/21
Toluene	<0.5	<0.5	1000.0	8/24/21
1,1,1-Trichloroethane	<0.5	<0.5	200.0	8/24/21
Tetrachloroethene	<0.5	<0.5	5.0	8/24/21
1,2,4-Trichlorobenzene	<0.5	<0.5	70.0	8/24/21
Trichloroethene	<0.5	<0.5	5.0	8/24/21
1,1,2-Trichloroethane	<0.5	<0.5	5.0	8/24/21
Vinyl chloride	<0.5	<0.5	2.0	8/24/21
Xylenes, Total	<0.5	<0.5	10000.0	8/24/21
Bromodichloromethane	<0.5	<0.5	TTHM*	8/24/22
Bromoform	<0.5	0.52	TTHM	8/24/22
Chloroform	<0.5	<0.5	TTHM	8/24/22
Dibromochloromethane	<0.5	0.79	TTHM	8/24/22
Bromobenzene	<0.5	<0.5	NR**	8/24/21
Bromochloromethane	<0.5	<0.5	NR	8/24/21
Bromomethane	<0.5	<0.5	NR	8/24/21
n-Butylbenzene	<0.5	<0.5	NR	8/24/21
sec-Butylbenzene	<0.5	<0.5	NR	8/24/21
tert-Butylbenzene	<0.5	<0.5	NR	8/24/21
Chlorobenzene	<0.5	<0.5	NR	8/24/21
Chloroethane	<0.5	<0.5	NR	8/24/21
Chloromethane	<0.5	<0.5	NR	8/24/21
2-Chlorotoluene	<0.5	<0.5	NR	8/24/21
4-Chlorotoluene	<0.5	<0.5	NR	8/24/21
Dibromomethane	<0.5	<0.5	NR	8/24/21
1,2-Dichlorobenzene	<0.5	<0.5	NR	8/24/21
1,3-Dichlorobenzene	<0.5	<0.5	NR	8/24/21
1,4-Dichlorobenzene	<0.5	<0.5	NR	8/24/21
Dichlorodifluoromethane	<0.5	<0.5	NR	8/24/21
1,1-Dichloroethene	<0.5	<0.5	NR	8/24/21
trans-1,2-Dichloroethene	<0.5	<0.5	NR	8/24/21
1,3-Dichloropropane	<0.5	<0.5	NR	8/24/21
2,2-Dichloropropane	<0.5	<0.5	NR	8/24/21
1,1-Dichloropropene	<0.5	<0.5	NR	8/24/21
1,3-Dichloropropene	<0.5	<0.5	NR	8/24/21
Hexachlorobutadiene	<0.5	<0.5	NR	8/24/21
Isopropylbenzene	<0.5	<0.5	NR	8/24/21
Naphthalene	<0.5	<0.5	NR	8/24/21

* TTHM: Trihalomethanes regulated separately as Disinfection Byproducts
** NR: Not Regulated

TABLE 2 (cont.)				
CONTAMINANT	OAKWOOD'S WATER		OEPA MCL	DATE COLLECTED
	Shafor	Springhouse		
SYNTHETIC ORGANIC CHEMICALS	ug/L	ug/L	ug/L	
Alachlor	<0.2	<0.2	2.0	8/10/23
Atrazine	<.03	<0.3	3.0	8/10/23
Simazine	<0.35	<0.35	4.0	8/10/23

CONTAMINANT	OAKWOOD'S WATER		OEPA MCL	DATE COLLECTED
	Shafor	Springhouse		
INORGANIC COMPOUNDS	ug/L	ug/L	ug/L	
Antimony, total	<4.0	<4.0	6.0	8/30/21
Barium, total	0.0793	0.0581	2.0	8/30/21
Beryllium, total	<1.0	<1.0	4.0	8/30/21
Cadmium, total	<1.0	0.780	5.0	8/30/21
Chromium, total	<10.0	<10.0	100.0	8/30/21
Cyanide, total	<5.0	<5.0	200.0	8/30/21
Fluoride,total	0.2	0.2	4.0	8/30/21
Mercury, total	<0.5	<0.5	2.0	8/30/21
Nickel, total	<20.0	<20.0		8/30/21
Selenium, total	<5.0	<5.0	50.0	8/30/21
Thallium, total	<1.5	<1.5	2.0	8/30/21

CONTAMINANT	OAKWOOD'S WATER		OEPA MCL	DATE COLLECTED
	Wonderly	Ridgeway		
TOTAL TRIHALOMETHANES	ug/L	ug/L	ug/L	
Chloroform	.61	1.4		8/25/22
Bromoform	1.7	5.2		8/25/22
Bromodichloromethane	1.5	4.7		8/25/22
Dibromochloromethane	2.4	6.8		8/25/22
Total TTHM's	6.2	18.1	80.0	

CONTAMINANT	OAKWOOD'S WATER		OEPA MCL	DATE COLLECTED
	Wonderly	Ridgeway		
FIVE HALOACETIC ACIDS	ug/L	ug/L	ug/L	
Dibromoacetic Acid	ND	2.8		9/25/22
Dichloroacetic Acid	<1.00	2.0		9/25/22
Monobromoacetic Acid	<1.00	<1.00		9/25/22
Monochloroacetic Acid	<1.00	<1.00		9/25/22
Trichloroacetic Acid	ND	2.3		9/25/22
Total HAA5's	ND	5.1	60.00	

CONTAMINANT	OAKWOOD'S WATER		OEPA MCL	DATE COLLECTED
	Shafor	Springhouse		
MISCELLANEOUS	mg/L	mg/L	mg/L	
Nitrate	1.3	1.3	10	8/10/23

CONTAMINANT	OAKWOOD'S WATER		OEPA MCL	DATE COLLECTED
	Shafor	Springhouse		
RADIOLOGICAL	pci/L	pci/L	pci/L	
Alpha, total	<3	<3	15	6/5/18
Radium-228	<1.0	<1.0	5	6/5/18

In 2023, the Oakwood water plants reduced the hardness of the raw water by 42.9%. Through the ion exchange process, this 42.9% reduction in water hardness resulted in a 147% increase in sodium content. Both of these percentages are within normal operating ranges.

III. WELL PUMPAGE REPORT AND CHARTS

The eight production wells produced 403,274,000 gallons of water in 2023, which is an average of 1,104,860 gallons per day. In 2023, the eight production wells produced 444,636,000 gallons of water. This represents a 9.3% decrease in raw water produced in 2023. The 2023 maximum day well production was on May 29th at 2,074,000 gallons. It is common that our highest usage occurs during the summer months when many property owners irrigate their lawns. The 2023 minimum day well production was on November 18th at 518,000 gallons. The minimum day production normally occurs in the fall or winter.

Out of the 403,274,000 gallons pumped in 2023, 50,128,000 gallons were used to either backwash the iron and manganese filters or regenerate the softening units at 210 Shafor and 120 Springhouse. This represents 12.4% of the total water pumped for the year, a 1.12% increase from 2022. The primary flow meters were replaced in 2020 and accurately report plant production.

Chart 1 below and Chart 2 on the next page show the 2023 water table draw down compared to 2020, 2021 and 2022.

CHART 1

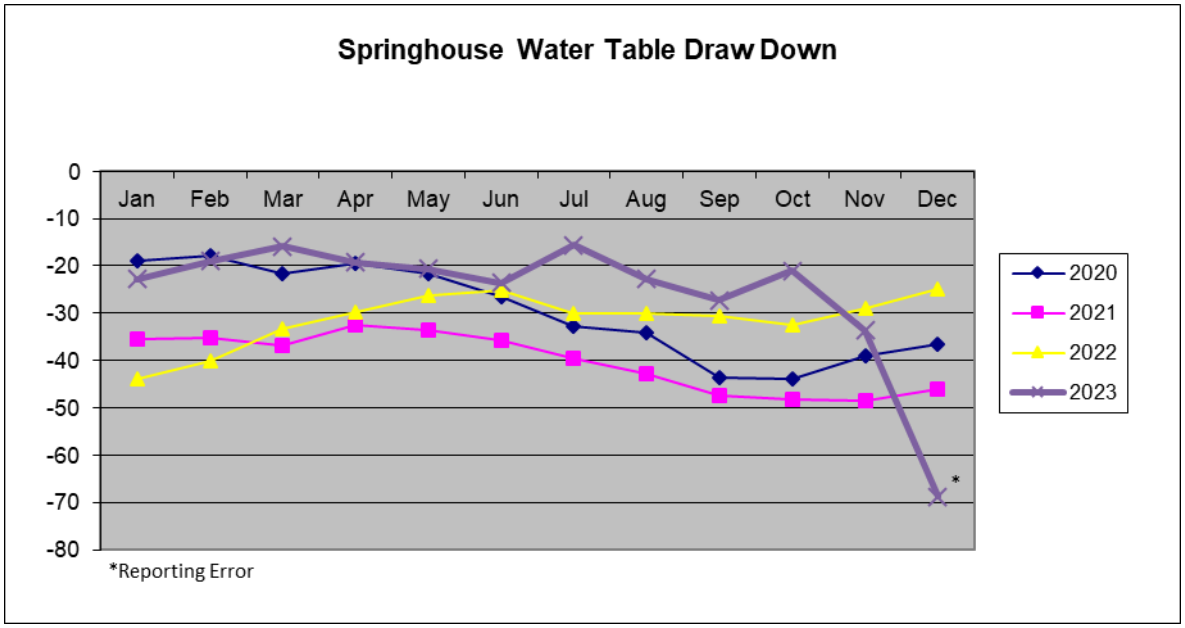
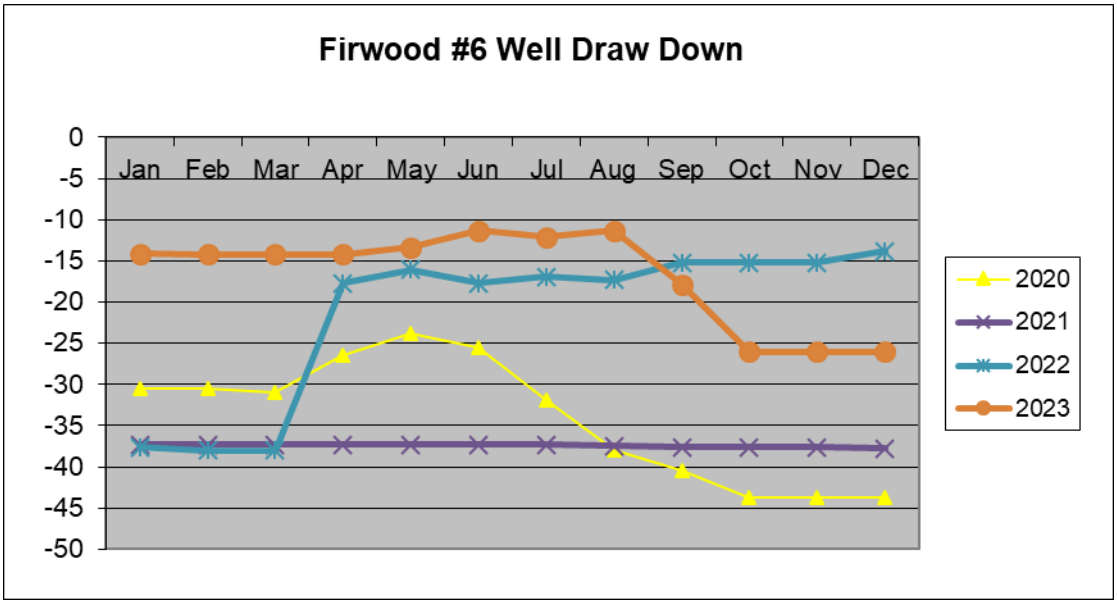


CHART 2



The aquifer water levels in the wells have been slightly stressed recently due to mild drought conditions with lower amounts of rain. During the summer and fall of 2020 we experienced a mild drought for several months resulting in the drop in the water table at the end of 2020, most pronounced at Springhouse. We measured monthly drawdowns at each well and noticed no significant changes.

Table 3 on the next page shows a comparison of total well production in gallons per well per month for 2022 and 2023.

IV. TOTAL PUMPAGE TO SYSTEM REPORT AND CHARTS

The City was able to produce water to meet 100% of the total demand of 353,146,000 gallons (968,000 avg/day). The maximum day system usage was on May 29th at 2,074,000 gallons and the minimum day system usage was on November 18th at 518,000 gallons. No fire events (i.e., extra demand) occurred in 2023 that required city of Dayton or Montgomery County water.

TABLE 3

CITY OF OAKWOOD WATER DEPARTMENT — **YEAR: 2023**

MONTHLY WELL PUMPAGE RECORD — **MONTH: December**

MONTH	WELL #1		WELL #2		WELL #3		WELL #4		WELL #5		WELL #6		WELL #7		WELL #8		MONTHLY TOTAL		ANNUAL TOTAL	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
JANUARY	21.350	14.302	0.000	0.009	0.000	0.000	0.000	7.944	1.407	3.245	1.315	2.116	2.604	0.000	12.053	0.000	38.729	27.616	38.729	27.616
FEBRUARY	17.340	10.590	0.000	0.000	0.000	0.000	11.013	13.261	5.546	0.012	0.162	0.000	0.064	0.000	0.000	0.000	34.125	23.863	72.854	51.479
MARCH	17.129	12.235	0.000	0.000	0.000	0.000	12.395	13.105	5.607	0.000	0.000	0.234	0.211	0.000	0.000	0.000	35.342	25.574	108.196	77.053
APRIL	17.957	16.463	0.000	0.007	0.000	0.000	11.604	3.881	4.532	2.508	2.899	4.051	0.057	0.020	0.000	0.000	37.049	26.930	145.245	103.983
MAY	17.933	18.434	0.000	0.088	0.000	0.000	12.999	6.822	4.232	1.901	3.259	4.860	0.118	0.046	0.000	3.822	38.541	35.973	183.786	139.956
JUNE	17.883	18.902	0.530	0.051	0.016	0.172	15.590	14.443	0.778	0.010	5.212	7.247	3.058	0.234	2.414	3.906	45.481	44.965	229.267	184.921
JULY	20.952	3.863	0.134	3.104	0.132	4.213	15.215	8.247	0.008	0.000	1.458	12.710	4.034	1.327	0.842	7.964	42.775	41.428	272.042	226.349
AUGUST	21.511	22.215	0.190	0.314	0.000	0.636	16.360	0.000	0.005	0.000	1.762	11.532	4.197	1.050	0.736	7.309	44.761	43.056	316.803	269.405
SEPTEMBER	20.034	20.797	0.133	0.002	0.167	0.003	4.795	0.000	0.000	0.013	6.932	9.711	4.585	1.304	0.997	11.881	37.643	43.711	354.446	313.116
OCTOBER	20.477	10.020	0.380	0.005	0.029	0.003	1.685	0.424	0.000	0.013	9.458	10.339	2.763	0.589	1.002	13.506	35.794	34.899	390.240	348.015
NOVEMBER	13.524	16.079	0.005	0.005	0.000	0.003	7.003	0.026	2.218	0.000	3.975	8.618	0.073	0.000	0.053	3.054	26.851	27.785	417.091	375.800
DECEMBER	13.761	14.967	0.000	0.000	0.000	0.000	9.748	10.145	4.036	0.000	0.000	0.104	0.000	2.258	0.000	0.000	27.545	27.474	444.636	403.274
ANNUAL	219.851	178.867	1.372	3.585	0.344	5.030	118.407	78.298	28.369	7.702	36.432	71.522	21.764	6.828	18.097	51.442	444.636	403.274	444.636	403.274
TOTALS	49.45%	44.35%	0.31%	0.89%	0.08%	1.25%	26.63%	19.42%	6.38%	1.91%	8.19%	17.74%	4.89%	1.69%	4.07%	12.76%	100.00%	100.00%		

AVG. DAY (2022 YTD):	1.218	M.G.D.				2022	Springhouse wells	221.567	MGD	49.83%		2023	Springhouse wells	187.482	MGD	46.49%				
AVG. DAY (2023 YTD):	1.105	M.G.D.					Firwood wells	223.069	MGD	50.17%			Firwood wells	215.792	MGD	53.51%				

Table 4 below shows a comparison of the water resources needed to meet the City's demands in 2022 and 2023.

TABLE 4
WATER RESOURCE RECORD

Location	2022 Gallons	2022%	2023 Gallons	2023%
Oakwood WTPs	394,192,000	99.97%	353,146,000	100 %
Dayton/Shroyer	134,000	0.03%	0	0%
Dayton/Springhouse	0	0%	0	0%
County/Fairmont	0	0%	0	0%
TOTALS:	394,326,000	100%	353,146,000	100%

There was a decrease in demand of 41,180,000 gallons of water in 2023 compared to 2022 (-10.4%). Table 5 on the next page shows the comparison in total gallons pumped to the system per month for 2022 and 2023.

V. MAINTENANCE

The following is a summary of the larger maintenance projects that took place in 2023.

January	Flow test all wells performed by Moody's
	Replace brine recycle valve and manhole gasket #3 filter – work by Artesian of Pioneer
	Replace level controller 120 Springhouse – work by Lower 48 Instruments
February	No issues
March	No issues
April	No issues
May	No issues
June	No issues
July	Replace pump #1 at Springhouse plant. Repair electrical controls, run new wires to pump #1.
	Repair water level monitor – work by Studebaker Electric
	Air issues with pump #4; pump taken off line
August	Replace brine pump at 210 Shafor Plant
	Replace manhole gasket on #3 filter 210 Shafor Plant
September	No issues
October	Replace chlorine injector. Issues with back feeding into tank – repair by city crew
November	Replace brine valve behind filters at 210 Shafor Plant – repair by city crew
	Replace auto dialer – work by Delta Controls
December	No issues

All preventive maintenance was performed on schedule and all day-to-day repairs were performed as needed. All parts inventories are up-to-date in case of emergencies.

TABLE 5

Oakwood, Ohio

CITY OF OAKWOOD WATER DEPARTMENT
MONTHLY PUMPAGE TO SYSTEM RECORD

YEAR: 2023
MONTH: December

MONTH	SPRINGHOUSE		FIRWOOD		DAYTON/SHROYER		FAIRMONT		DAYTON/SPRING.		MONTHLY TOTAL		ANNUAL TOTAL	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
JANUARY	18.590	13.594	14.672	11.191	0.000	0.000	0.000	0.000	0.000	0.000	33.262	24.785	33.262	24.785
FEBRUARY	15.051	9.996	14.534	11.074	0.000	0.000	0.000	0.000	0.000	0.000	29.585	21.070	62.847	45.855
MARCH	14.534	11.653	15.714	11.037	0.000	0.000	0.000	0.000	0.000	0.000	30.248	22.690	93.095	68.545
APRIL	15.114	15.693	16.552	8.994	0.000	0.000	0.000	0.000	0.000	0.000	31.666	24.687	124.761	93.232
MAY	15.462	17.667	18.174	14.689	0.000	0.000	0.000	0.000	0.000	0.000	33.636	32.356	158.397	125.588
JUNE	16.964	18.019	23.535	21.485	0.134	0.000	0.000	0.000	0.000	0.000	40.633	39.504	199.030	165.092
JULY	20.078	10.937	18.766	25.445	0.000	0.000	0.000	0.000	0.000	0.000	38.844	36.382	237.874	201.474
AUGUST	20.560	21.045	19.849	17.078	0.000	0.000	0.000	0.000	0.000	0.000	40.409	38.123	278.283	239.597
SEPTEMBER	19.457	18.334	14.858	19.166	0.000	0.000	0.000	0.000	0.000	0.000	34.315	37.500	312.598	277.097
OCTOBER	19.945	8.676	12.619	20.540	0.000	0.000	0.000	0.000	0.000	0.000	32.564	29.216	345.162	306.313
NOVEMBER	12.900	13.864	11.350	9.523	0.000	0.000	0.000	0.000	0.000	0.000	24.250	23.387	369.412	329.700
DECEMBER	13.139	12.919	11.775	10.527	0.000	0.000	0.000	0.000	0.000	0.000	24.914	23.446	394.326	353.146
ANNUAL	201.794	172.397	192.398	180.749	0.134	0.000	0.000	0.000	0.000	0.000	394.326	353.146	394.326	353.146
TOTALS	51.17%	48.82%	48.79%	51.18%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%		

2022 Summary		
	M.G.	
Oakwood:	394.192	99.97%
Dayton:	0.134	0.03%
County:	0.000	0.00%
TOTAL:	394.326	100%

2022 Avg. per day 1.080 MGD

2023 Summary		
	M.G.	
Oakwood:	353.146	100.00%
Dayton:	0.000	0.00%
County:	0.000	0.00%
TOTAL:	353.146	100%

2023 Avg. per day: 0.968 MGD

VI. BUDGET/FINANCES

The 2023 budget allocation for Oakwood Water Production was $690,197.72. In 2023, the Oakwood Water Production Unit spent $616,679.75 toward the production of the City's water. This computes to an average cost of $1,529.18 per million gallons pumped from the city's eight wells in 2023, up from $1,354.86 per million gallons in 2022. The cost per million gallons will fluctuate up or down depending on the total water demand and maintenance costs for the year. In 2023 the average water demand was lower than 2022. We continually strive to bring down the cost of water by optimizing our treatment process.

The water production unit budget consists of five main categories: personnel, utilities, chemicals, maintenance and miscellaneous. The following charts show what percentage of the budget goes to each of these categories and shows a comparison from the year before.

CHART 3

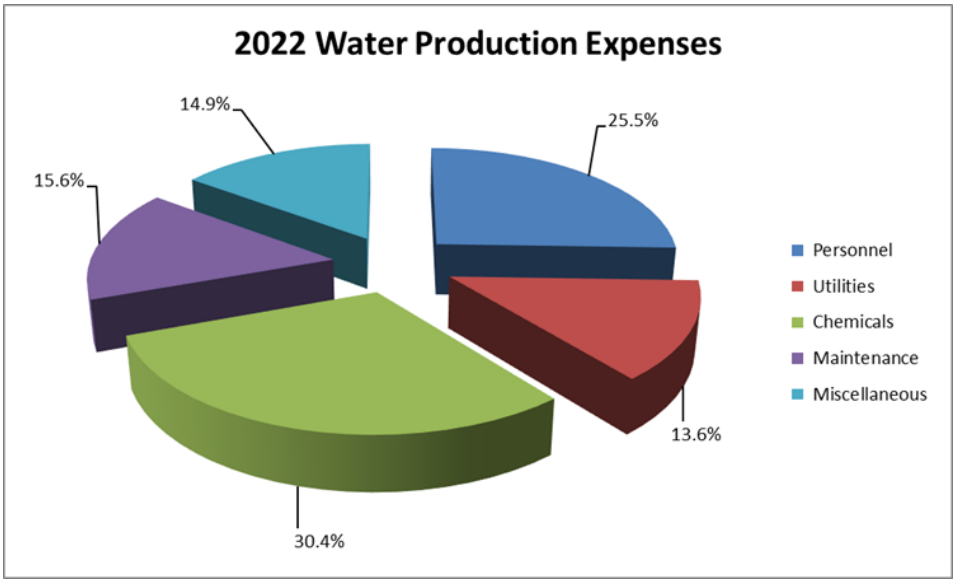
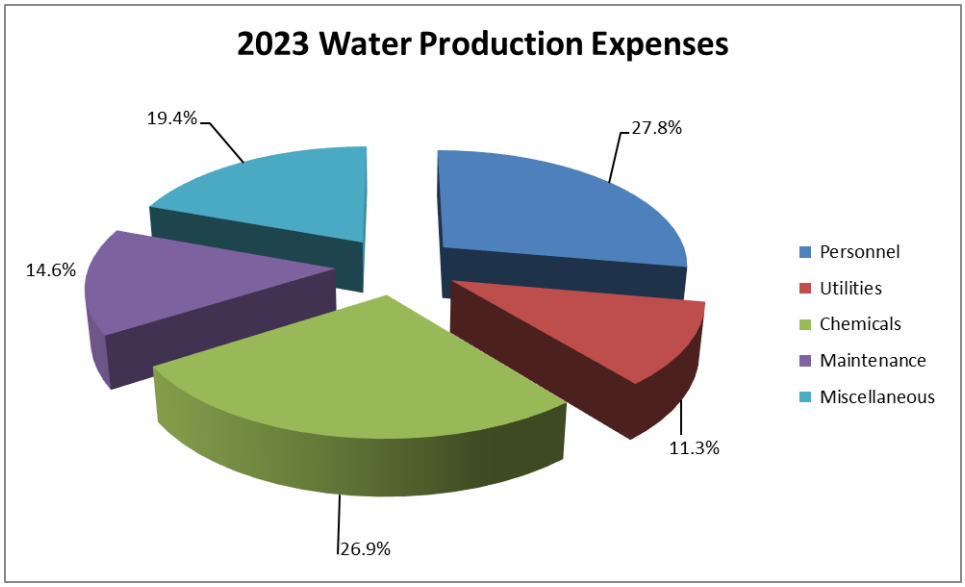


CHART 4



Personnel costs were $171,289.21 for the year representing an 11.4% increase from 2022. Utility costs were $69,812.59 which includes electric and natural gas representing a 15.1% decrease from 2022. Chemical costs were $166,175.28 representing a 9.3% decrease over 2022. A total of 900.01 tons of salt compared to 931.59 tons in 2022 and 3,790 gallons of sodium hypochlorite compared to 3,135 gallons in 2022 were used to treat the water.

Maintenance costs were $89,719.32 representing a 4.2% decrease compared to 2022.

VII. CONCLUSION

In reviewing our water system, 2023 was another successful year. All monthly and annual reports to the Ohio EPA and Ohio Department of Natural Resources were submitted on time. All lab testing was completed as required. We met or exceeded all Ohio and Federal EPA requirements and regulations. Our OEPA NPDES Surveys were conducted in February 2019 and no violations were found. The next survey will be conducted in 2024. We had a sanitary survey in 2021 for the treatment plants and distribution system and no violations were found. The next sanitary survey will be in 2024.

We continually look at ways to optimize our treatment process in order to maintain high water quality at the lowest cost. Some recent accomplishments include replacing faulty micro-switches, rebuilding process valves, adjusting treatment sequences, and more closely monitoring regeneration cycles on the softeners. We replaced the system controls at 210 Shafor and 120 Springhouse which allows us to better monitor and adjust the treatment process. In 2017 we continued to improve our water treatment plants by replacing the original softening media in the four filters at 210 Shafor Boulevard. All process valves on these four units were completely rebuilt to assure accurate operation. In November 2019 we replaced the original softening media in the three filters at 120 Springhouse Road. All process valves on these three units were completely rebuilt in 2020 and 2021.

In looking forward, we will continue to seek ways to operate the water plants in the most efficient manner producing the highest quality water possible.