2022 ANNUAL REPORT

Wastewater Treatment Plant

City of Manchester

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Manchester IA, 52057

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2022 WWTP Annual Report

Superintendent: Perry Peterson, Hire Date - 2/6/1989
Grade 3 Wastewater, Grade 3 Water Treatment, Grade 2 Water Distribution

2 CEU's needed for **Wastewater** by 3/31/23:

On-line Nutrient Removal Class 8/19/21-9/16/21 -1.2 CEU's

IAWEA Region 1 Meeting, Manchester 10/27/21 - .5 CEU's
IAWEA Region 1 Meeting, Manchester 10/26/22 - .5 CEU's
IAMU Annual Meeting, Des Moines 12/6/22 - 1.2 CEU's

2 CEU's needed for **Water Treatment/Distribution** by 3/31/23:

AWWA Region 1 Annual Meeting, Manchester 3/2/22 - .6 CEU's
IRWA Annual Fall Meeting, Dubuque 10/4/22 - .9 CEU's
AWWA Region 1 Annual Meeting Manchester 3/23 - .6 CEU's

Other duties: Certified Pool Operator, Project Inspector, Handles all Iowa One Calls, DNR Region 1 IAWEA Operator's Meeting Board Member.

Operator: Matt Wieser, Hire Date - 7/6/21

0 CEU's needed for **Wastewater** by 3/31/23:

Attended 30-hour class at Kirkwood Community College for wastewater 11/22

Testing for Grade 1

CEU = Continuing Education Units
1 hour of DNR approved training = .1 CEU
2 CEU's = 20 hours of DNR approved training

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Annual Treatment Totals:

	Flows.	AVG. INF. BOD	AVG. EFF. CBOD	AVG. AMMONIA	AVG. EFF. TSS
	Million Gallons	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Jan.	12,634,000	228	3.4	.06	2.1
Feb.	10,804,000	279	3.2	.05	1.6
Mar.	15,465,000	245	3.2	.06	1.8
Apr.	19,058,000	180	2.6	.07	2.8
May	23,186,000	127	3.8	.09	5.9
June	19,321,000	100	2.0	.07	2.7
July	16,727,000	175	2.3	.09	2.9
Aug.	17,484,000	136	2.1	.09	3.2
Sept.	13,560,000	143	1.2	.09	3.9
Oct.	12,171,000	275	2.2	.08	2.2
Nov.	11,923,000	280	2.6	.08	2.7
Dec.	11,528,000	241	3.8	.05	2.8
	183,861,000				

Notes:

INF.- Influent, flow coming into the wastewater plant

EFF.- Effluent, the flow leaving the wastewater plant

BOD-Biochemical Oxygen Demand, which is a measure of the "strength" of the wastewater. Effluent limit for the 30-day average is 25 mg/l.

TSS-Total Suspended Solids, which is a measure of the solids that are floating or in suspension in the wastewater. Effluent limit for the 30-day average is 30 mg/l.

Mg/l-milligrams per Liter. One mg/l is equivalent to one part per million parts

Ammonia Nitrogen limit varies by the month, limits range from 8.6 to 20.9 mg/l

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Other DNR required testing:

	Inf. TKN	Eff. Total Phosphorus	Eff. Total Nitrogen	E. coli	Copper	Chromium
	Monthly	Quarterly	Quarterly	1/3	Monthly	Monthly
	mg/l	*mg/l*	*mg/l*	*MPN/100ml*	*mg/l*	*mg/l*
Jan.	42	9.1	37		.016	<.01
Feb.	40				.020	<.01
Mar.	38				.018	<.01
Apr.	34	8.1	29		.017	<.01
May	22			83	.015	<.01
June	24				.018	<.01
July	28	4.7	27	<1	.015	<.01
Aug.	39				.012	<.01
Sept.	38				.020	<.01
Oct.	42	9.1	40	<10	.016	<.01
Nov.	45				.016	<.01
Dec.	51				.019	<.01

Notes:

Inf.- Influent, flow coming into the wastewater plant

Eff.- Effluent, the flow leaving the wastewater plant

TKN-Total Kjeldahl Nitrogen

Mg/l- milligrams per Liter. One mg/l is equivalent to one part per million parts.

MPN- Most Probable Number per 100 milliliters

E. coli – We are required to run 1 set of 5 samples every quarter that we are running the UV System for disinfection. Our limit is the Geometric Mean, not to exceed 126/100 milliliters, of the 5 samples. We are required to run the UV System from March 15th to November 15th.

Metals, Copper and Chromium, were added in 2021 under our new permit that went in effect in July. This was added because Stanley Black and Decker is being classified as a significant industrial user for metals.

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Points of Interest for 2022:

UV System:

In 2022 the system ran fine. We did have a lightning strike late in the season that took 1 rack out of service. All testing was fine without running this rack. Parts have been ordered and will be replaced to get this rack back in service by the March 15th startup date in 2023.

Aeration Basins:

Aeration basin #3 had several leaks show up after we replaced all diffusors in 2021. With the busy construction season in 2022 we did not get to fixing these. We have taken the basin off line, the plant operates fine with only 2 basins in service. We will get at this right away in 2023. The plan then is to replace all diffusors in basin #2 after the new budget year starts.

Lift Stations:

The 2 new lift stations came online late summer of 2022. Oakview and Grayson are running fine and the radios are connected to the computer at the WWTP. We are waiting for the generator to get installed at Grayson's in the spring of 2023. This was delayed by supply issues.

The Motel lift station had a trash basket and hoist installed in 2022. This will help with all the pump plugging we were seeing from the growth on the west end of the city.

We have replaced impellers/wear rings on both pumps at 2 lift stations in the last year. We will be looking to have these replaced at the Industrial Park lift station in 2023.

Lab Certification:

We completed our annual Water Pollution Proficiency Testing in November 2022. This is required to keep our lab certified. We passed all 4 areas we are required to do. Our lab permit expires May 1 of 2023, our lab will be inspected by the state on February 23 this year. We will continue to use Keystone Labs in Waterloo for our E. coli and sludge testing. Total Nitrogen, phosphorus, and metals testing will be done by the hygienic lab in Ankeny.

Valves:

We have several mud valves at the WWTP that have broken over the years**.** In 2022 we had Top Grade Exc. fix one on the new clarifier, this valve was 17' deep and we didn't have a way to do it ourselves. There are 3 more broken valves, but these are on the sludge hauling system. Since Joe is using his own equipment to haul these are not a top priority. We will schedule to get these replace over the next few years. These types of valves should not have been used in the plant upgrade. We also had to replace the gear assembly on 1 telescopic valve on the small digester.

Sludge Hauling:

We were able to get the sludge hauled in November this year. This was the last year on our contract for hauling with Joe Hildebrand. We are looking to extend the contract for another 2 years. We are looking at a rate increase from 4 cents a gallon to 4.5 cents a gallon. We are still looking at have 700,000 gallons hauled annually. This will take our budget up by $3500 per year for the 2-year contract.

Projects:

2022 was a very busy year for projects. With the East Main project starting in March and lasting throughout the year and finishing up in October. We also paved Meadow Park 4th and Oakview subdivisions in the spring.

2 lift stations were started and with all the supply delays did not get competed until later in the year.

We also completed a water main replacement project on the west end of town.

Manhole Rehab:

We finally got the manholes on the west side of Animal Health, in the waterway, sealed. We had Connolly Construction do this while they were replacing the water main on the west end of town. Several of the manholes had open pick holes in the manhole lids and none of them had exterior chimney seals. During heavy rain conditions this was causing back up issues at the lift station just downstream from here. While 2022 was a fairly dry year, we have seen and big improvement in the flow going to the lift station.

Sump Pump Issues:

I have included some information in the back of this report to show you how the wet weather affects what we see coming into the wastewater plant. The graph compares the water pumped by the water department to what we are seeing coming into the plant on a monthly basis. I have also included a thirteen-year total rainfall so you can compare the wet years to the high flows that we receive. It should be a better way to understand what sump pumps are doing to our totals. With another dry year our flows at the WWTP have stayed low again. We just need to keep in mind that on a wet year our flow increases by up to 25+% because of sump pumps and infiltration.

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Goals for 2023:

Projects:

2023 will be a planning year for projects. We have already started working on the planning for the 2024 street project. We will be working with contractors this summer to get all lines and poles moved and lines underground. This will take a lot of locating and making sure things get in the right place so they do not conflict with anything in 2024.

Aeration Basins:

Our goal is to have aeration basin #3 leaks fixed right away this spring. We will then replace all diffusors and purge valves in basin #2. The river level has a lot to do with how soon or fast we can get this done. We aim to have all running back to "normal" by the end of summer.

Sewer Rate Review:

As you can tell on page 8 of this report, our cost per thousand is exceeding what we charge per thousand for sewer rates. With the NPDES permit expiring on 1/1/26 I want to make sure we are not too far behind on rates if the new permit requires some improvements for phosphorus on nitrate removal. The 2% increase we are using now is not getting us ahead.

Lift Stations:

We now have 7 of the 9 lift stations that we can control from the WWTP by radios. With the Fairview Subdivision getting close to full and running a lot more, I would like to look into getting radios installed in this subdivision. The lift station on North 4th that takes care of the trailer court is an older style blower lift station. This would take complete reconstruction to be able to get new controls that can be run by radios.

We will be having some larger expenses at the Industrial Park. Pumps will need to get pulled and wear rings and impellers will need to be replaced.

We would like to start looking at getting more generators installed at lift stations for power outages. We cannot stay ahead with manual pumping when several lift stations are down at the same time.

Recap:

In 2023 we will stay proactive with repair and maintenance at the WWTP. We take pride in the plant and are doing what we can to keep the costs down. We are in year 14 and things are needing more and more repairs. Hopefully we can do most of them ourselves, but the larger ones will need to be contracted out.

Matt will be getting his Grade 1 license this year and I will be testing for my Grade 4.

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Iowa One Calls

	2017	2018	2019	2020	2021	2022
Jan.	18	10	10	20	4	8
Feb.	61	5	0	16	9	12
Mar.	63	15	32	143	43	60
Apr.	77	83	117	140	120	85
May	92	117	81	94	94	105
June	66	80	76	125	84	95
July	75	58	112	75	77	77
Aug.	105	101	85	70	85	124
Sept.	58	52	79	85	86	145
Oct.	80	98	59	65	115	82
Nov.	66	68	69	48	65	48
Dec.	42	16	32	39	34	14
Totals:	803	703	762	920	816	855

These are the requests for locates we received, broken down by month. After the one calls are received, we have 48 hours to mark out any conflicts with city utilities. If we find that there are none, we can clear the ticket.

Wastewater Treatment Cost

Fiscal year 2021/2022 budget was used to put this report together. The total gallons treated were gathered from January to December 2022 to calculate the totals below. We bill in thousands of gallons.

183,861,000 gallons treated

Our current sewer fee is $6.51 / 1000 gallons.

To treat the wastewater:

Electricity:	$87,121.73
Heating Fuel:	$21,120.33
Testing:	$7,339.86
Sludge Hauling:	$28,000.00
WWTP Upgrade Debt:	$385,600.00
	$529,181.92

$529,181.92 / 183,861,000 gal. = $0.00288 per gallon

$0.00288 x 1000 gallons = $2.88 per thousand gallons

To operate the Wastewater Department:

Total Expenditures:	$1,368,149.90

$1,368,149.90 / 183,861,000 gal. = $0.00744 per gallon

$0.00744 x 1000 gallons = $7.44 per thousand gallons

This report shows that it costs $0.93 more to treat the wastewater than what we are charging. While the last 2 years have been dryer, this skews the total some, we are not getting ahead with the rate increases we are doing annually. We really need to take a close look at our annual rate increase so we can get ahead and start putting aside some money for upgrades that will be coming in the next 10 years.

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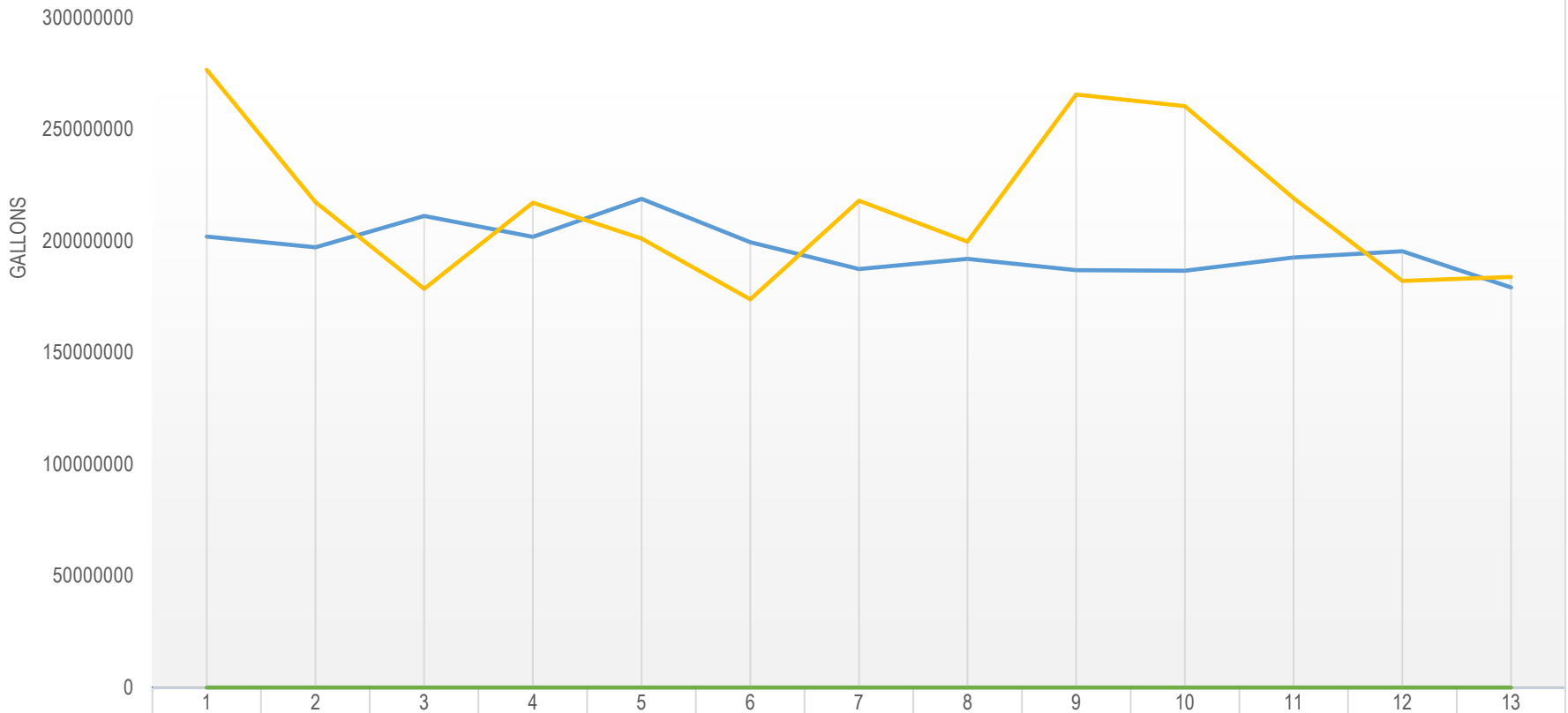
Annual Water Pumped to Wastewater Treated:

Year	Water Pumped	WW Treated	Annual Rainfall
2010	201,908,000	276,586,000	46.94"
2011	197,165,000	217,327,000	38.37"
2012	211,131,000	178,491,000	27.44"
2013	201,792,000	217,033,000	42.93"
2014	218,799,000	201,085,000	34.45"
2015	199,384,000	173,815,000	38.43"
2016	187,352,000	217,945,000	40.68"
2017	191,959,000	199,597,000	33.49"
2018	186,879,000	265,568,000	52.57"
2019	186,647,000	260,306,000	48.59"
2020	192,504,000	219,094,000	40.35"
2021	195,359,000	182,081,000	32.16"
2022	179,152,000	183,861,000	35.25”
2023			

There is a lot of information in this report. If anyone has any questions or concerns, please do not hesitate to contact me with any questions. I can be reached by phone at 563/920-0628 or you can stop out to the wastewater plant at any time.

Perry Peterson
Wastewater Superintendent/
Project Inspector
City of Manchester

City Of Manchester Water/Sewer Pumpage



	1	2	3	4	5	6	7	8	9	10	11	12	13
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Water Pumped	201,908,000	197,165,000	211,131,000	201,792,000	218,799,000	199,384,000	187,352,000	191,959,000	186,879,000	186,647,000	192,504,000	195,359,000	179,152,000
Wastewater Treated	276,586,000	217,327,000	178,491,000	217,033,000	201,085,000	173,815,000	217,945,000	199,597,000	265,568,000	260,306,000	219,094,000	182,081,000	183,861,000

MILLION GALLONS

Year Water Pumped Wastewater Treated