

# Jefferson County Water and Sewer District

## Jefferson County, Ohio



# 2016-2017 ANNUAL REPORT

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## 2016 -2017 ANNUAL REPORT

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## **Water and Sewer System Operations and Maintenance Noteworthy Accomplishments 2016 – 2017**

The following noteworthy tasks or accomplishments were recognized during 2016 – 2017 in both the water and sewer system, as well as relative to District offices:

- Installed approximately 500 feet new 6' HDPE along State Rt. 164 adjacent to Carole Patrick's horse paddock (Bergholz);
- Rebuilt pressure reducing valves (PRVs) in Costonia, on CR 41 near Richmond, and in system G-1 near Rayland;
- Spare pumps obtained for G-1 Booster and Belvedere Booster Stations;
- New pump purchased and installed in M-Booster Station;
- Outside lighting change-over under American Electric Power Incentive Program;
- Began a program to replace at least ten fire hydrants per year;
- Installed a new 10" meter on the main from the Norton Hill booster station;
- Took over the Sewer System for Friendship Park and got the pump stations operational;
- Replaced the dehumidifier and cooling units inside the TTLBS booster station;
- Repaired controls and check valves at the M. Booster station;
- Prepared and submitted to OEPA comprehensive mapping of the watersystem depicting the locations of lead piping and services;
- Chlorine Injection installed at Norton Hill booster station.
- Replaced pump seals on several pumps at sewage pump stations throughout the sewer system;
- Conduct flow and pressure testing of water lines and hydrants in the watersystem serving the Village of Smithfield.

### Water System

- Repaired 64 waterlines in 2016;
- Installed 41 new taps in 2016;
- Relocated 2 waterlines for ODOT and County Engineer's projects in 2016;
- Collected 4,766 water Sampler for chlorine residual testing and bacterial disinfection by-product testing with 0 violations in 2016!

### Sewer System

- Treated 193,000,000 total gallons of sewage at all sewage treatment plants;
- Processed and disposed of 79.24 dry tons of stabilized sludge from all plants.

## Jefferson County Water and Sewer Rates Quick Reference for Billing Information

**Basic Water Bill** = \$33.79 (3,000 gallons)

**Basic Sewer Bill** = \$44.75 (3,000 gallons)

**Basic Water & Sewer** = \$78.54 (3,000 gallons)

\* Overage \$7.5 for Water per 1,000 gallons

\* Overage \$7.50 for Sewer per 1,000 gallons

Water Rates			
Meter Size	Min. Bill	Allowance	Overage
3/4"	\$33.79	3,000 Gal.	\$7.50
1"	\$56.77	5,000 Gal.	\$7.50
2"	\$142.59	12,000 Gal.	\$7.50
4"	\$287.22	24,000 Gal.	\$7.50
6"	\$577.13	48,000 Gal.	\$7.50

Sewer Rates			
Meter Size	Min. Bill	Allowance	Overage
3/4"	\$44.75	3,000 Gal.	\$7.50
1"	\$59.75	4,500 Gal.	\$7.50
2"	\$110.75	9,600 Gal.	\$7.50
4"	\$476.75	46,200 Gal.	\$7.50
6"	\$707.75	69,300 Gal.	\$7.50
Georges Run	\$21.75	9,000 Gal.	\$7.50
Century Hills	\$41.75	9,000 Gal.	\$7.50

## Implementation of Fire Hydrant Maintenance Procedures

The Water and Sewer District is making plans to implement a comprehensive fire hydrant maintenance program as described below. This program will protect these valuable assets of the District and also maximize each hydrant's ability to furnish water during times of need.

- It is recommended that hydrants be inspected (flushed) twice a year, spring and fall. After each use in extremely cold weather, a hydrant should be checked specifically for drainage.
- External Inspection:
  - Check chains – make sure they allow nozzle cap to turn freely
  - Check all caps – make sure they all can be removed
  - Check paint – remove all loose paint and repaint if necessary
- Lubricate Hydrant Prior to Operating
  - Where it is specified use white mineral oil USP. Vegetable oil is not equal!
  - Where grease is specified use Machinery Grease
- Flush Fire Hydrant
  - Use Hydrant Operating Wrench to turn hydrant
  - Do not close or turn off too quickly to create water hammer
- If hydrant fails to shut off, do not force to close the hydrant, open back up and flush again.
- If hydrant fails to drain, put all caps in place and tighten. Then open the hydrant two to three turns to attempt to flush out drains.
- If hydrant still does not drain, it should be pumped after each use.



## **Capital Improvement Programs**

### **Jefferson County Water and Sewer District**

The Jefferson county Water and Sewer District is working diligently to develop a Capital Improvement Program that will result in the District being among the best in the State in maintaining its vital infrastructure. This program involves constantly assessing the condition of its infrastructure and understanding the relative condition of all aspects of the water and wastewater infrastructure for implementation of a quality capital improvement program. Steps being followed include:

1. Asset Inventory
2. Historical Performance Data/Maintenance History
3. Asset Criticality
4. Maintenance Standards and Requirements
5. Maintenance Management Planning and Software
6. Capital Replacement Planning Policy

One of the most critical decisions to be made in determining whether or not to repair or replace major system components is determining replacement cycles for assets and whether or not this a replacement program should be reactive to system failures and breakdowns OR be a prediction to provide replacement BEFORE failures or breakdowns occur.

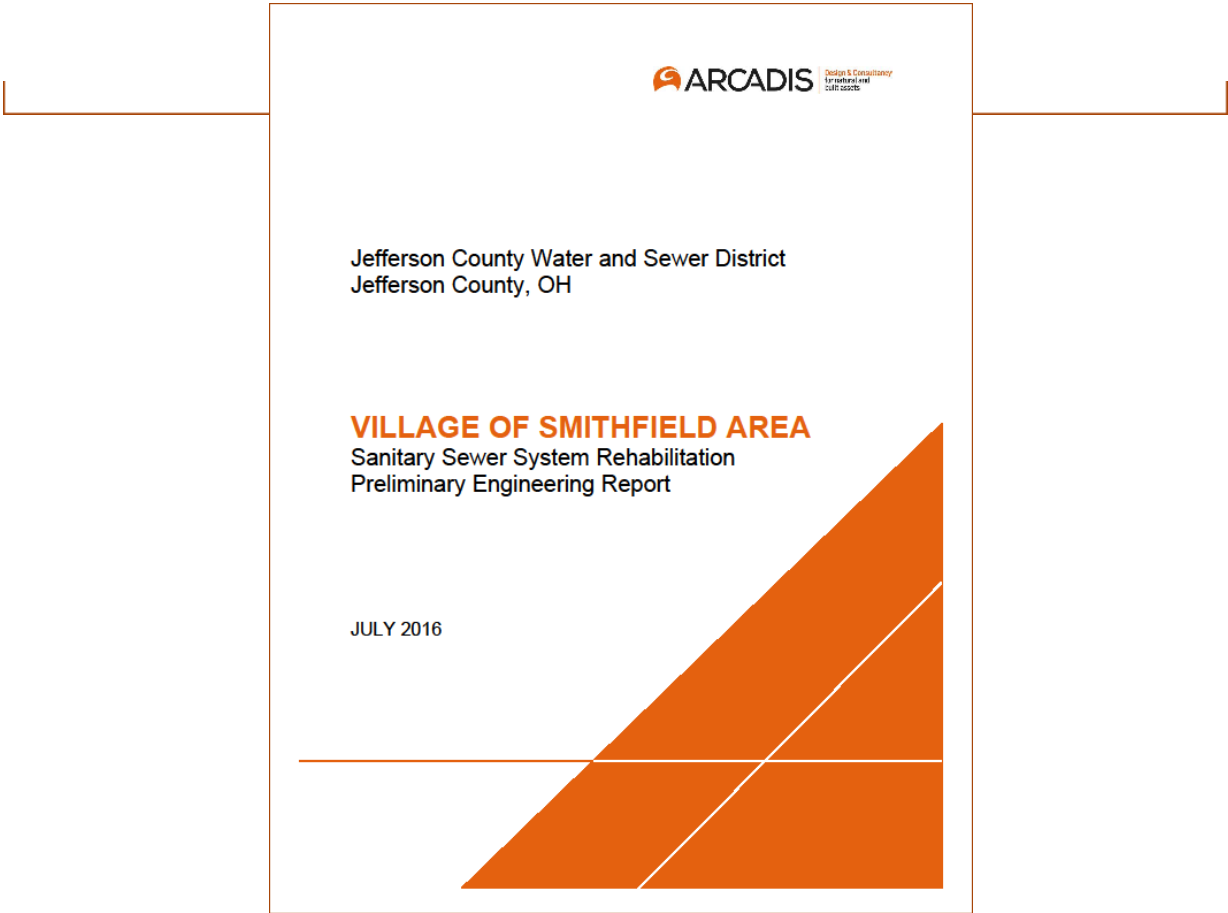
Information tools the District is using to achieve the correct result include:

1. Accessibility of data on age, repair history, construction materials, and criticality
2. Cost information to base a decision on
3. Financing mechanisms for major repair and replacements
4. Budget or rate levels in short and long term forecasting to sustain maintenance and replacement programs
5. Staff, equipment, materials, and systems needed to mount major maintenance improvements or initiatives
6. Trained staff
7. Policy direction or commitment by elected officials

# Smithfield Sewer Project: Sanitary Sewer System Upgrade Serving the Village of Smithfield.

During 2016 and 2017, the Jefferson County Water and Sewer District has been in negotiations with the Village of Smithfield, Ohio EPA, and USDA to take over ownership and operation of the Village sewer system, including the sewage treatment plant. The District has been operating the system since early in 2017 to attempt to render the system functional once again.

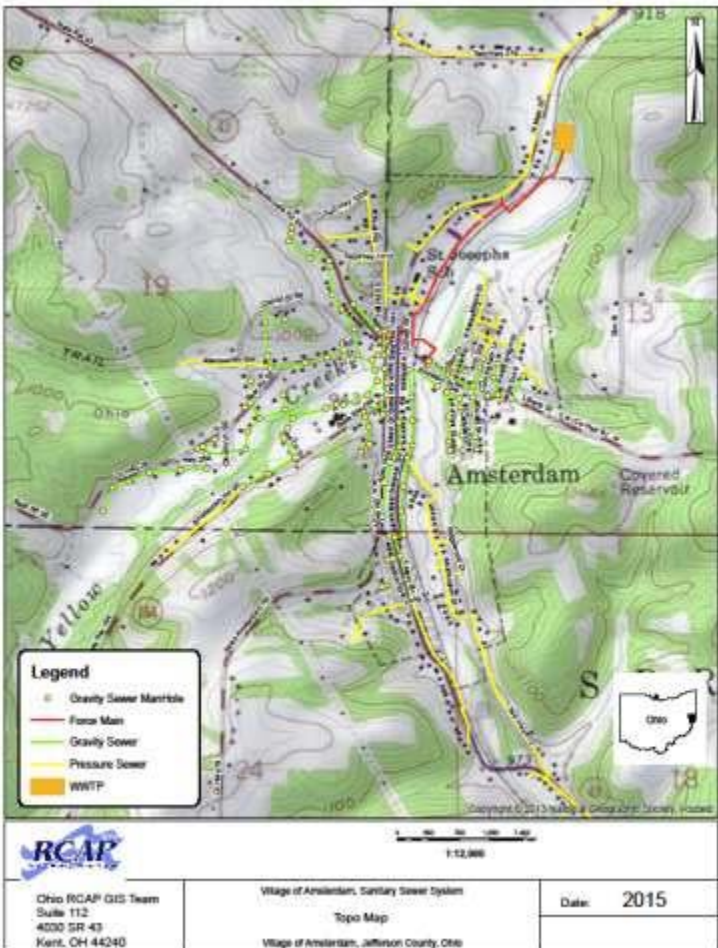
At such time that the District takes over the system officially, improvements to the sewage treatment plant, pump stations, and collector sewers will need to be designed and constructed in order to bring the system back into compliance with regulatory requirements and NPDES effluent limits. It is estimated that the cost for this effort will be approximately \$4.4 million.





## Amsterdam Sewer Project: Sanitary Sewers System to Serve the Village of Amsterdam, Springfield Township and portions of Carroll County.

- Estimated Cost :
  - Sewer Collection System and Inteceptors to STP: \$7.64M
  - Sewage Treatment Plant: \$2.1 M
  - Total: \$9.7M
- Approx. 63,000 linear feet of utility lines, a treatment plant, attendant features
- Preliminary Engineering Report completed
- Phase I Environmental Assessment completed
- Archaeological and Cultural Resource Surveys completed
- Aerial Mapping completed
- Field surveying completed
- Funding has been requested through ACOE, OMEGA, CDBG, EJDC, OPWC, USDA, WPCF
- Public Meeting held December 14, 2016
- Advertise for construction bids – April, 2018



# State Route 213 Relocation Project

Project Start Date: January 20, 2016

Project End Date: February 19, 2016

This Project was awarded to Ohio West Virginia Excavating in the amount of \$77,297.50.

The relocation of approximately 486 feet of 8-inch water main at the intersection of State Route 213 and County Road 56 in Jefferson County, Ohio. The project included wet tapping the existing main and a stream crossing.



## Georges Run Lift Station Generator Project

Proceeding Date: August 18, 2016

End Date: November 1, 2016

This Bid Project was awarded in the amount of \$48,800.00 to Cattrell Companies, Inc. This was paid in part with a \$38,000 CDBG Program Grant.

The project for the Georges Run Lift Station Generator included:

- mobilizing materials, tools and equipment to the jobsite
- providing all supervision, labor, materials, and tools for the electrical scope of work
- providing and installing a 25 KW natural gas engine generator according to the specs and drawings
- providing and installing a 70 amp automatic transfer switch in place of the existing manual transfer switch
- providing and installing all necessary conduit and wiring to the new generator, control panel and auto-transfer switch
- providing and installing the natural gas tie in to the generator



## Mingo Water Improvements Project

Project Start Date: October 25, 2016

Project End Date: March 24, 2017

This Project was awarded to Border Patrol, LLC in the amount of \$225,235.00 (Base Bid) and \$106,260.00 (Alternate 1), for a total bid price of \$331,495.00. The project was completed for a cost of \$329,473.80.

The project consisted of constructing a booster station and approximately 775 feet of 4-inch transmission main near Wilson Avenue in Mingo Junction. It also included the construction of 1830 linear feet of 6-inch distribution main along County Road 28 and Rinker Road to Sunshine Park in Steubenville.

The project work for the Mingo Junction Booster Station included:

- Booster Station
- Inline Shut-Off Valves.
- 6-Inch HDPE – 1,830 L.F.
- Hydrant Assemblies
- Paving
- Service Connections



## SCADA/Telemetry

Project Start Date: October 29, 2016

Project End Date: April 12, 2017

This Project was awarded to Cattrell Companies, Inc. in the amount of \$940,000.00.

The final contract totaled \$933,100.00 for this completed project.

Work included installing a new SCADA server at the Jefferson County Services Center and the addition of a Redundant SCADA server at the Barbers Hollow Waste Water Treatment Plant (BHWWTTP). It also included the installation of a PLC telemetry cabinet at the Services Center as well as the WWTP. Telemetry cabinets were installed at the M-Tank as well as the wastewater lift stations installed as part of the Crestview Belvedere Sewer Project.

Project work included:

- Electrical Site Work at:
  - Service Center (2 sites)
  - Barber's Hollow
  - M-Tank
  - Pump Station #1 & #2
  - Janet, Donna & Norma Drive.
- Highland Park
- Control System Supplier
- Radio Systems Supplier



## Star Hill Area (Bergholz) Waterline Replacement

The Star Hill area is currently served by a 2-inch galvanized steel distribution main that has severely scaled and deteriorated to the point where the average inside diameter of the pipe is about 1 inch. This area is currently not served by a booster pump station. The system pressure is provided solely via the Bergholz water tank. Due to the deteriorated condition of the pipe, the pressure losses in the pipe greatly reduce the hydraulic grade line to the point where system pressures are 10 to 15 psi at best.

The District is currently in the process of replacing this 2 inch main with a 6 inch diameter HDPE waterline with fire protection. This main will carry an estimated pressure of about 30 to 35 psi without an inline booster station. The booster station, and pump when installed, will increase system pressures to these Valley View Drive residents on Star Hill to about 60 to 80 psi. A bypass around the booster pump will be installed in the event the pump is down for replacement or repairs.



# Smithfield Water Tank: The Smithfield Water Tank Serves the Village of Smithfield, Piney Fork, and Dillonvale Ridge in Jefferson County, OH

After studying options, the District decided to install a new 200,000 gallon water storage tank and demolish the existing tank. The estimated cost of this project is \$1,500,000.

- Water Storage Tank is a 100,000 gallon double-box lattice-leg steel-riveted hemispherical-bottom elevated tank
- Inspection Report dated September 17, 2015 states there have been 5-10 leaks in the tank over the previous five years, and a leak in the riser has recently been repaired under an emergency condition
- Report also states that although the structural integrity of the tank is sound, its overall condition is poor
- Further repairs to leaks in the tank were made in June 2015; January, March, April, and May 2016
- Holes have been plugged but new holes keep forming
- New tank will be designed per current applicable standards and will provide 100 years of service life
- Construction of a new tank that will be in full compliance with AWWA, Ohio EPA and OSHA regulations
- Jefferson County Water and Sewer District anticipates entering into an engineering agreement in June 2016 for design of the new tank
- Completion of the project will depend on the availability of other funding sources

Shown Below: **Location A – Parcel 33-03653-000** Jefferson County GIS Map



## Ridgeland Sewage Treatment Plant (STP) –

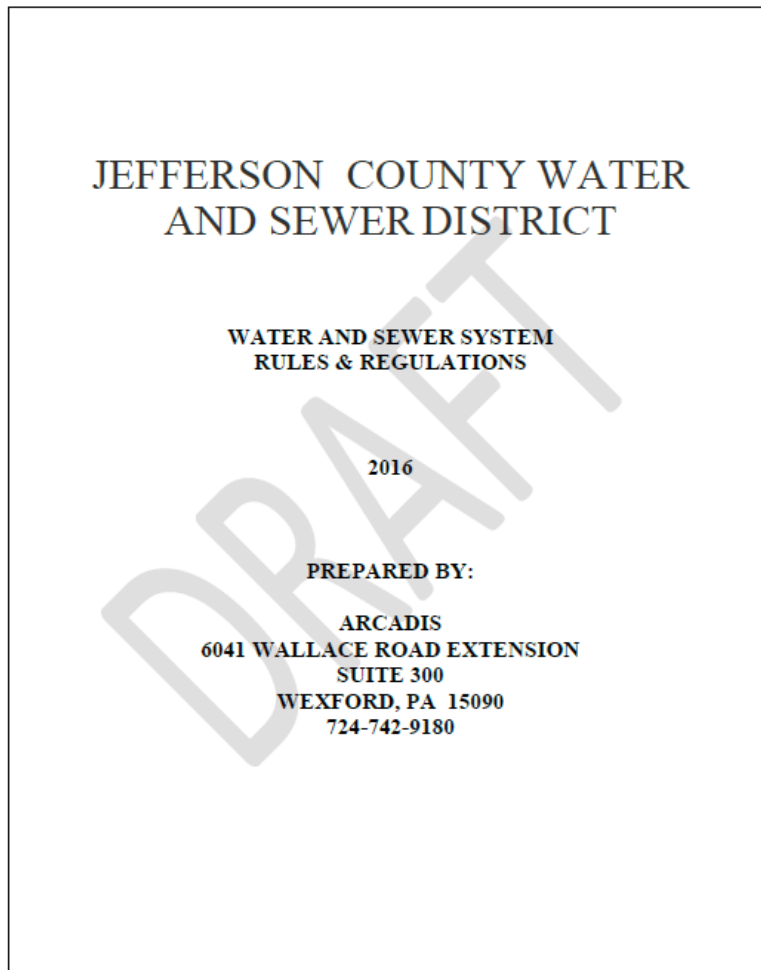
This is operated by the Jefferson County Water and Sewer District (JCWSD). The Ridgeland STP serves approximately 46 customers in Island Creek Township which is located northwest of the intersection of County Road 42 and County Road 46.

- This treatment facility is a 35,000 gpd Topco Aero-Fuse extended aeration package treatment plant built in 1969 of fabricated steel.
- In a 2005 report, it stated the ADF in 2003 was 5,900 gpd and 6,570 gpd in 2004.
- To better improve the operations and compliance at the sewage treatment plant, the District will:
  1. Inspect all manholes; waterproofing interior of any leaking manhole.
  2. Smoke test the sewer lines in the Ridgeland Development
  3. Dye test building down spouts: failing ones will be addressed
  4. Examine and modify the return activated sludge system
  5. Begin to haul sludge for more frequent control
  6. Have flow meter calibrated annually
  7. Examination of customer base will be performed to determine why discrepancy between water usage and treated wastewater flows is pronounced
  8. Evaluate and purchase as necessary, appropriate field equipment for permit/process control testing done in the field
- Implementing these procedures will cost under \$50,000.00
- There are two main alternatives identified and evaluated for bringing the STP into permanent, long term NPDES Permit compliances:
  1. Abandon present STP and connect to the City of Toronto Sewer System
    - Includes decommission, abandonment and demolition of the existing Ridgeland STP and conveying all current flow to the City of Toronto Sewer System
    - Estimated Cost is \$1,366.625.00
  2. Construction of a New STP adjacent to the existing plant and abandon the present STP
    - New precast concrete activated sludge package treatment plant complete with bar screen, blower building, standby power, flow meter, and aerobic digestion unites would be built on the present site adjacent to the existing plant. Approx. flow 20,000 gpd
    - Estimated Cost is \$975.000.00
    - The District is planning to construct a new sewage treatment plant and has applied for funding.



## **Jefferson County Water and Sewer District Rules & Regulations**

The Rules and Regulations were drafted and prepared in April of 2016 by Arcadis US, Inc. The Rules and Regulations are complete with industry standard details for the Water and Sewer divisions. It also includes 807 sections with three Appendices equaling 140 pages. The District would like to implement these by 2018.



2016 Flow Daily Averages, Totals and Chlorine PPM

		Averages												Totals	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Area M	Total		57.93	51.74	54.39	52.89	57.7	54.06	54.56	53.53	51.46	53.21	48.83	54.51	<b>644.81</b>
	Daily Av.		1.869	1.784	1.755	1.763	1.861	1.802	1.76	1.727	1.715	1.717	.693	1.758	
	Min		1.54	1.58	1.56	1.54	1.6	1.48	1.14	1.35	1.45	1.4	1.32	1.4	
	Max		2.37	2.03	1.95	2.05	2.28	2.05	2.08	2.14	2.02	2.04	1.84	2.2	
	Free		0.77	0.68	0.65	0.65	0.7	0.52	0.62	0.7	0.51	0.67	0.72	0.72	0.659
	Avg. Cl.* PPM		0.9	0.81	0.83	0.78	0.81	0.65	0.74	0.82	0.64	0.78	0.85	0.85	0.788
Area A	Total		15.527	15.066	15.111	14.524	15.857	15.651	15.559	16.038	15.108	16.102	16.048	15.25	<b>185.841</b>
	Daily Av.		0.501	0.52	0.488	0.484	0.512	0.522	0.502	0.517	0.504	0.519	0.535	0.492	
	Min		0.456	0.445	0.447	0.412	0.449	0.479	0.335	0.477	0.478	0.472	0.468	0.396	
	Max		0.57	0.606	0.53	0.556	0.586	0.647	0.594	0.567	0.586	0.567	0.631	0.589	
	Free		0.71	0.67	0.74	0.06	0.8	0.72	0.59	0.55	0.68	0.76	0.75	0.66	0.641
	Avg. Cl.* PPM		0.84	0.83	0.89	0.75	0.93	0.84	0.71	0.68	0.81	0.87	0.88	0.78	0.818
Area J	Total		1.282	1.059	1.024	1.026	1.135	1.156	1.375	1.065	1.035	1.039	1.363	1.165	<b>13.724</b>
	Daily Av.		0.04	0.037	0.033	0.034	0.037	0.028	0.044	0.034	0.035	0.034	0.045	0.038	
	Min		0	0	0	0	0	0	0.011	0.01	0.01	0.01	0.017	0.012	
	Max		0.065	0.033	0.033	0.034	0.051	0.061	0.201	0.201	0.042	0.044	0.09	0.062	
	Free		1.06	0.99	0.91	1.01	1.17	1.36	1.07	0.84	0.7	1	1.58	1.74	1.119
	Avg. Cl. PPM		1.21	1.14	1.06	1.2	1.33	1.48	1.17	0.99	0.8	1.11	1.76	1.89	1.262
Area O	Total		0.642	0.616	0.648	0.658	0.706	0.689	0.741	0.76	0.696	0.735	0.741	1.092	<b>8.724</b>
	Daily Av.		0.021	0.021	0.021	0.022	0.023	0.023	0.024	0.025	0.023	0.024	0.025	0.035	
	Min		0.019	0.019	0.019	0.02	0.019	0.02	0.017	0.021	0.021	0.022	0.022	0.022	
	Max		0.023	0.024	0.024	0.026	0.03	0.029	0.036	0.043	0.026	0.027	0.029	0.097	
	Free		0.65	0.74	0.89	0.46	0.62	0.46	0.41	0.61	0.42	0.77	0.75	0.89	0.639
	Avg. Cl. PPM		0.78	0.87	1.06	0.58	0.76	0.58	0.51	0.72	0.53	0.88	0.9	1	0.764

\*Average chlorines for areas M and A, where there is typically more than one analysis performed, are based on the lowest daily value found.

Total In MG  
**853.099**

1.95	2.06	1.73	1.98
1.99	2.14	1.76	2.06
1.97	2.1		
1.95	2.04		
1.85	1.98		
1.84	2		
1.91	2.09		
1.9	2.09		
1.75	1.87		
1.76	1.91		
2.15	2.2		
1.98	2.2		
1.93	2.19		
1.69	1.91		