

A tall, blue water tower stands in a grassy field under a blue sky with white clouds. The tower has a spherical tank at the top and a lattice structure below. In the foreground, there is a wooden signpost and some greenery. The background shows a line of trees.

CITY OF WOOSTER

UTILITIES DIVISION

**ANNUAL REPORT
FOR YEAR 2013**

Prepared by

Kevin P. Givins
Utilities Manager

Contributions from
Robert King
Water Treatment Supervisor

Steve Carathers
Wastewater Treatment Supervisor

Milan Steiner
Distribution/Collection Supervisor

Michael Schultz
Laboratory Technician

Lee Troyer (Retired 12/31/2013)
Pretreatment Coordinator

March 1st, 2014

EXECUTIVE SUMMARY

The most significant events for the Utilities Division during 2013 were the return of the Distribution/Collection/Meter group to the Utilities Division after the realignment of staffing, the improved performance of the WPCP that recorded only two effluent violations in 2013 and the completion of the Quasar Energy Group project at WPCP. The Quasar project began in May and initial testing and startup was being conducted as the year closed. Quasar's system appears to be capable of supplying enough power to meet the plant base demand as well as the capacity to handle the solids load. The end of 2013 also brought about the retirement of Lee Troyer, Pretreatment Coordinator. Lee has elevated the standard for the position and we wish him well in his future endeavors.

The Water Plant produced a total of 1.312 billion gallons of potable water in 2013. This total is an increase of 114 million gallons from 2012. The average daily production was 3.596 million gallons with a peak of 4.20 million gallons on June 15th. The average per capita usage was 135 gallons per day based on the current population estimate of 26,619. Production costs for chemicals alone totaled \$230.73/Million Gallons (MG) of water produced; however, total plant expenses (minus capital improvements) put the costs at \$1,506/MG produced.

Unaccounted water losses continue to be a problem for the City water system. In 2013, 42% of the water treated and pumped from the plant was not billed to an account. These losses are attributed to distribution line losses (main leaks), service leaks, unmetered accounts, unauthorized use and meter inefficiency. In 2013, the entire system was leak surveyed twice and 31 main leaks were identified and repaired. The Utilities and Finance Divisions also completed a billing system audit and production meter calibration in an attempt to reduce water loss.

In total, the WPCP treated 1.678 billion gallons of wastewater in 2013 with the average daily flow being 4.599 million gallons per day and receiving a peak daily flow of 20.02 million gallons on July 10, 2013. This is an increase of 142 million gallons over 2012 due to more precipitation and higher water plant output. In addition, the plant treated 2.62 million pounds of biological oxygen demanding (BOD) substances and 3.45 million pounds of suspended solids from the wastewater.

WATER POLLUTION CONTROL PLANT

SUMMARY TREATMENT OPERATIONS

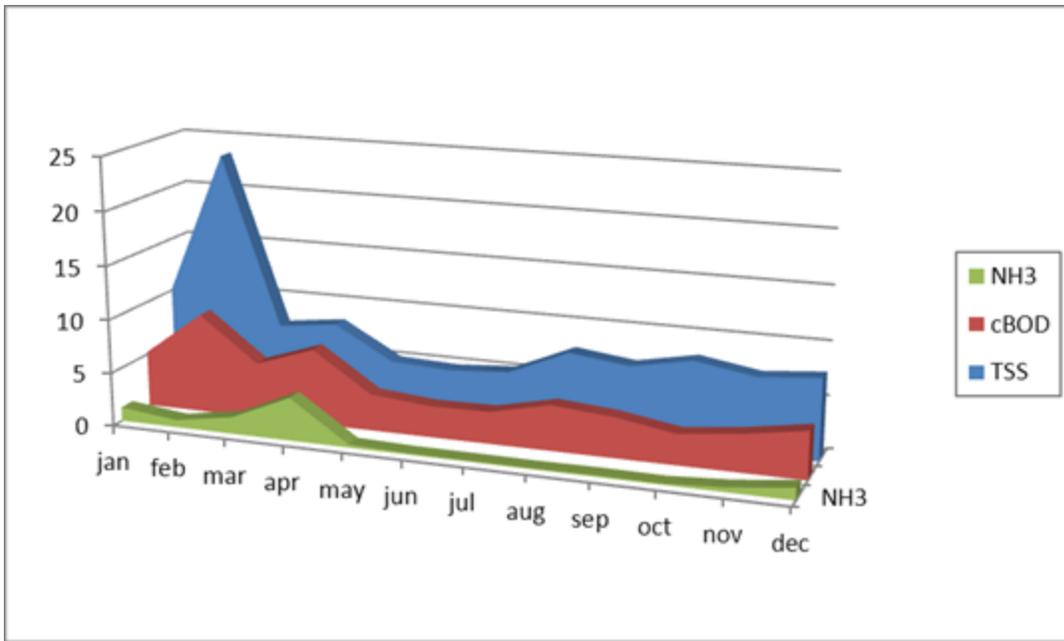
After the 2007 plant upgrade, the failure of the treatment strategy to effectively reduce the accumulation of solids and in conjunction with the Ohio Environmental Protection Agency Director's Final Findings and Orders forced the City to mitigate the design flaws and contract solids handling with Quasar Energy Group. The project consists of refurbishment of the three existing anaerobic digesters, a third party waste receiving station and installation of a 1 megawatt cogeneration system. The initial groundbreaking occurred in May and construction was finished by year end. Preliminary tests of the cogeneration system provided enough power to meet the plant's baseline demand. Quasar is now accepting third party substrates as well all of the biosolids produced from the City waste stream. The storage lagoons were turned over to Quasar in August and they are now responsible for the land application and reporting requirements of the CFR 503 Beneficial Use Regulations.



The “wet stream improvements” recommended in the 2012 URS Plant Evaluation Report, have been designed and the project will be released for bid in the summer of 2014. The Permit to Install has been submitted to the Ohio EPA and we are awaiting approval. Construction is slated to begin this year and completed by the end of 2015. The major components of the improvements are increased aeration, better scum removal (including fats, oil and grease), SCADA enhancements and clarifier rehabilitation.

In total, the WPCP treated a total of 1.678 billion gallons of wastewater with the average daily flow being 4.592 million gallons per day receiving a peak daily flow of 20.02 million gallons on July 10, 2013. This represents a total increase of 142 million gallons over 2012. In addition, the plant removed 2.62 million pounds (design is 5.02 million pounds) of biological oxygen demanding (BOD) substances and 3.45 million pounds (design is 3.65 million pounds) of suspended solids from the wastewater. The flow design of the facility is for 7.5 million gallons per day with a hydraulic maximum of 27 million gallons.

In contrast to the wastewater treated at this facility, the Water Treatment Plant produced on average 3.596 million gallons per day. The reasons for this obvious disparity of .996 million gallons per day between water produced and wastewater treated in 2013 is attributed to a combination of precipitation entering the WPCP through the combined sewer system, collection system infiltration and un-metered sources. The infiltration component of this disparity continues to be actively addressed. The Utility and Engineering Divisions jointly continue to pursue the implementation of a sewer separation program. Un-metered sources are being identified and metered as part of the continuing meter upgrade program; however, some areas of the system (i.e. Killbuck South sewer district and some areas in Madisonburg) will not be metered as they are sewer only accounts and receive a flat rate billing.

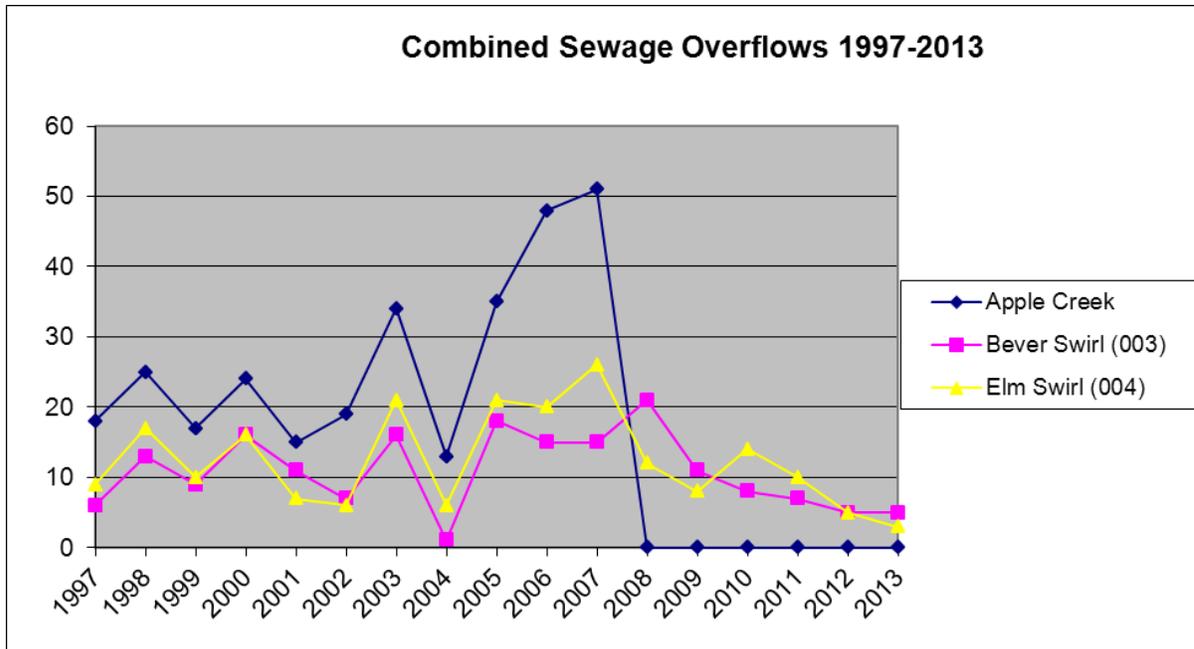


The typical strength of wastewater is calculated in relationship to three basic attributes, Carbonaceous Biochemical Oxygen Demand (CBOD), Suspended Solids (SS) and Ammonia (NH3). An additional indication of wastewater strength, Chemical Oxygen Demand (COD) is used primarily at our industrial users due to the repeatability and speed in which information can be derived by testing. The average daily strength of the wastewater treated at this facility in calendar year 2013 was 7,238 pounds of CBOD, 9,650 pounds of TSS and 753 pounds of NH3. When comparing to the design of the facility, the plant is operating at 48% CBOD loading, 96% TSS loading and 86% Ammonia loading.

WPCP cost's per million gallons of treated wastewater in 2013 was \$575 for O&M costs (28% less than 2012) and the total cost of WPCP operations and personnel was \$1,197/MG (a 12.5% reduction from the previous year).

Given that based on design criteria, a person contributes 0.167 lbs of BOD and 0.2 pounds of SS per day. Looking at 7,238 lbs per day influent BOD and 9,650 pounds per day of TSS load to the plant, the plant is treating the equivalent waste stream of 43,341 people for BOD and 48,250 people for SS.

The ongoing sanitary/storm water separation projects continue to show improvement on controlling surface water from entering the City collection system and overloading the hydraulic capacity of the treatment plant. The combined sewer overflow structures that allow raw wastewater to enter the Apple Creek were activated 8 times in 2013. That total represents the lowest amount in the last 17 years. As part of the City's long term control plan, the goal is to only activate the overflows when a 5-year storm event occurs.



INDUSTRIAL PRETREATMENT / BIOSOLIDS PROGRAM

The City of Wooster's Sewer Use Ordinance and Enforcement Response Guide provide the legal authority to enforce the OEPA approved pretreatment program of the city as well as USA EPA regulations

A conscious effort is made through training and the Internet to keep current with rule changes pertaining to pretreatment, and modification requests will be submitted for EPA approval, when deemed necessary.

Pretreatment operating procedures in place are adequate and followed to meet program goals. All sampling and reporting requirements were met in this pretreatment year. Annual inspections have been delayed because the pretreatment coordinator is retiring, but will be back in March, 2014 to do some training and will accompany the new coordinator to the IU's for inspections as part of that training and to introduce him to the contacts.

All industrial users that meet the criteria, as established by the EPA, of a Categorical Industrial User (CIU) or Significant Industrial User (SIU) are monitored for compliance with categorical and/or local limits for conservative and conventional pollutants. In addition, additional sampling is done to insure non-domestic wastewater dischargers are in compliance with local limits. Currently the city has two permitted CIU's and two SIU's and monitors other non-significant dischargers for compliance.

In addition to quarterly compliance sampling, several industrial users discharging higher than normal conventional pollutants are sampled weekly for Chemical Oxygen Demand (COD)

and Total Suspended Solids (TSS). The analytical results of those samplings are averaged for each month and a sewer surcharge for high strength waste is billed accordingly.

This year The City of Wooster published one Significant Industrial User (Enviro Clean) and two Non Significant Industrial Users (Buckeye Container and Ohio Agricultural Research and Development Center) for discharge violations.

The City of Wooster Pretreatment Program is financed through the city sewer fund. No financing problems were experienced in this pretreatment year or are anticipated for the next pretreatment year.

All financing needed for the administration of the program is available. Approximate costs for the program in the year 2013 were: payroll-\$66,000; training-\$100; outside lab work-\$8,000; and misc.-\$200; totaling \$74,300 not counting vehicle expense.

Approximately fifty percent of the Pretreatment Coordinators time is spent on Pretreatment with the remaining time used to cover vacation time for technicians in the lab, monitoring and reporting bio-solids, and working on the F O G program. A van is always available for the program to do sampling, inspections, etc.

The City of Wooster experienced no spills, interferences or pass through of toxins directly attributable to industrial discharges.

All U. S. and Ohio EPA sampling and reporting requirements for the City of Wooster's bio-solids program were met in 2013.

The city entered into a contract with Quasar in July, 2013 to process the city's bio- solids as well as final disposal. Quasar revamped the existing digesters and related piping and installed a new co-generation unit to make better use of gas produced by anaerobic digestion. Startup of that unit was done in late December and looks very promising.

Listed in the following table are the gallons, percent solids and dry tonnage of the Class B bio-solids that were land applied in 2013 to farms in Wayne, Holmes, and Ashland counties by Agri-Sludge Inc, the city's contract land applicator. Anaerobically digested sludge is mixed with spent lime sludge, from the city's water production plant, in the storage lagoons before land application as fertilizer for crops. No complaints were received from the land application of bio-solids. Unannounced inspections at some of the application sites were made to ensure compliance with the standards set forth in 40 CFR 503.

Month	Gallons	Avg % Solids	Dry Ton
January	745,400	3.8	118
February	1,143,700	9.2	439
March	762,980	6.3	200
April	1,237,050	7.4	381
May	1,345,250	5.8	325
June	518,750	7.4	160
July	618,750	10.7	276
August	112,500	10.2	48
September			
October			
November			
December			
Total	6,484,380		1,947

Special WPCP Projects Completed in 2013

- ❖ New gravity belt thickener installed and commissioned in December.
- ❖ Septage receiving has been initiated on a limited basis as plant compliance improves.
- ❖ Old Co-generation unit was sold to Quasar and new 1MW unit is being tested as the year ended.
- ❖ Former chemical storage area has been converted to a training/conference room available to all City Departments. Several meetings and classes have already taken place.
- ❖ Wet stream improvement design was finished and submitted to Ohio EPA.
- ❖ Installed refurbished impellers on #5 influent pump and post air Masei pump.
- ❖ Nupp Drive Lift Station pumps were rebuilt.
- ❖ Painted #1 & #2 Final Clarifiers
- ❖ Negotiated new NPDES Permit with Ohio EPA. Bis-2 and mercury limits removed, new excursion parameter for dissolved oxygen limit initiated and construction deadlines for the completion of the City's Long Term Control Plan were eliminated.
- ❖ RAS pump for #5 & #6 final clarifiers rebuilt.

Below; Demolition of the chemical storage room containment wall. ***Right;*** Training room after carpet installation.



**WATER POLLUTION CONTROL PLANT
EMPLOYEE ROSTER as of 1/1/14
(Certification level)**

MANAGEMENT:

Utilities Manager

Kevin Givins (WW III)

Plant Supervisor

Steve Carathers (WW III)

LABORATORY TECHNICIANS:

Michael Shultz (WW III)

Rod Musser (WWIII)

PRETREATMENT/BIOSOLIDS COORD.:

Lee Troyer (WW III) (retired 12/31/13)

OPERATORS:

Benjamin Martin (WW I)

Rick Shilling (WW I)

Adam Wilford (WW III)

Charlie Scott (WWI)

ASSISTANT OPERATOR

Cody Bower (WW I OIT)

PLANT MECHANICS (shared with WTP):

Ray Windsor (WWII)

Chad Frank (WW I)

ACCOUNT CLERK (shared with PPMD):

Janell Cooper

Water Pollution Control Plant Goals and Objectives for 2014

- Maintain Compliance with NPDES Permit
 - Add additional SCADA monitoring, control and reliability as part of upcoming construction project
 - Increase treatment capacity, aeration and scum removal with URS wet stream improvements
 - Complete Schedule of Compliance in new (2013) NPDES Permit
 - Increase operation (and revenue stream) of septage receiving station
 - Modify process flows to improve ammonia/nitrogen treatment
 - Reduce utility energy demand with cogeneration system
 - Refurbish grit removal system Krebs cyclone to increase efficiency
 - Restore drive units and infrastructure of #3 & #4 final clarifiers
 - Clean Bever St. and Elm St. Swirl concentrators

- Continue Staff Training and Professional Development
 - Host OTCO Basic & Advanced Wastewater Training Courses
 - Update Lock Out/Tag Out, Blood Bourne Pathogen, and Personnel Protective Equipment Training
 - Send Staff to exam preparatory class for OEPA Wastewater Certification Exam
 - Begin training of solids handling/digesters with Quasar to position plant personnel to eventually assume operation of the system
 - Finish remodel of former chemical room into new staff training/conference room
 - Fill vacant Assistant Operator position

- Replacement of Obsolete and Worn Equipment
 - Remove unused SAF unit, cyclone and belt thickener
 - Rebuild Moyno sludge pumps (as needed)
 - Restore Aquionics UV units (3)
 - Refinish/replace pumps at older lift stations

WATER TREATMENT PLANT

TREATMENT OPERATIONS

The City of Wooster's Water Treatment Plant (WTP), now in its 16th year of operation, continues to perform well. The overall reliability of the plant systems has been excellent with the aid of our well trained and attentive operations and maintenance staff.

Finished water pumped to the city in 2013 increased by 114 million gallons from the previous year for a total of 1.312 billion gallons. The high duty pumps sent an average of 3.59 million gallons per day of finished water into the distribution system. The peak-pumping day occurred on June 15th when 4.20 million gallons of finished water was pumped into the city. The average per capita usage of water in 2013 was 135 gallons per day (based on population data of 26,619).

The chemical cost per million gallons of treated water in 2013 was \$230.73 while the total cost of WTP operations and personnel was \$1,506/MG. The decrease of chemical costs from the previous year (\$240.44) was due to better than expected bid prices and increased production from the water plant.



Avg. chemical cost per million gallons finished water

YEAR	LIME	SODA ASH	CHLORINE	CO2
2003	\$59.48	\$15.77	\$17.36	\$7.25
2004	\$72.31	\$17.95	\$21.46	\$9.91
2005	\$114.06	\$23.59	\$31.73	\$10.56
2006	\$121.44	\$25.82	\$31.05	\$8.52
2007	\$114.16	\$31.80	\$22.58	\$9.95
2008	\$122.28	\$35.32	\$22.38	\$13.47
2009	\$127.19	\$38.54	\$30.87	\$14.83
2010	\$125.71	\$37.69	\$29.41	\$12.65
2011	\$140.69	\$41.73	\$23.44	\$12.59
2012	\$148.08	\$42.93	\$34.42	\$15.01
2013	\$144.28	\$43.67	\$25.86	\$16.92

Annual chemical usage (in pounds)

YEAR	LIME	SODA ASH	CHLORINE (in gallons)	CO2
2003	2,250,126	340,446	41,896	178,309
2004	2,436,907	306,616	46,896	219,410
2005	2,607,260	320,853	52,155	210,899
2006	2,417,440	311,940	45,883	170,141
2007	2,322,350	317,163	49,313	198,571
2008	2,482,800	330,000	44,856	261,200
2009	2,501,644	308,622	42,026	280,971
2010	2,604,814	309,347	50,066	279,712
2011	2,433,240	304,865	44,468	284,815
2012	2,411,607	306,815	43,374	285,115
2013	2,647,538	335,271	42,947	346,816

Annual Water Plant Production 2003-2013

YEAR	TOTAL MILLION GALLONS RAW WATER	TOTAL MILLION GALLONS FINISHED WATER	AVERAGE CHEMICAL COST PER MILLION GALLONS	AVERAGE HARDNESS RAW WATER mg/L	AVERAGE HARDNESS FINISHED WATER mg/L
2003	1391	1378	\$ 99.86	371	111
2004	1278	1267	\$121.10	389	117
2005	1303	1290	\$179.94	389	119
2006	1260	1249	\$186.83	379	114
2007	1252	1240	\$186.83	365	110
2008	1260	1248	\$193.45	371	110
2009	1197	1185	\$211.43	374	112
2010	1281	1269	\$205.46	369	108
2011	1188	1176	\$218.47	369	108
2012	1209	1197	\$240.43	367	107
2013	1325	1312	\$230.73	365	108

Sludge, a byproduct of the lime and soda ash softening process, is pumped to the sludge lagoon at the Water Pollution Control Plant. There were 22.84 million gallons of lime and soda ash sludge pumped to the WPCP in 2013. The sludge is mixed with the biosolid residuals from the Water Pollution Control Plant and land applied on agricultural fields throughout Wayne, Holmes and Ashland counties.

The city well fields continue to provide sufficient water. The North Well Field average water level was 32.9 feet. Its lowest level was in June at 24.4 feet, and the high was at 39.1 feet in April. The S-1 Well in the South Well Field averaged 41.9 feet of water peaking at 48.8 feet in August and a low of 39.2 feet in January. The S-2 Well in the South well field averaged 41.6 feet, peaking at 53 feet in August, and a low of 24.7 feet in July. The S-3 Well averaged 53.3 feet, peaking at 59 feet in July to a low of 46 in April.

Average water well levels (in feet)

WELLS	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
North Well Field	23.2	28.6	30.3	29.9	31.0	33.2	31.4	30.1	34.4	31.8	32.9
South Well Field S-1	54.4	64.5	60.4	58.8	58.8	40.2	38.3	37.9	41.6	39.0	41.9
South Well Field S-2	28.5	54.8	46.1	43.2	43.2	45.1	42.8	42.8	47.2	42.9	41.6
South Well Field S-3					54.1	54.1	59.3	54.3	57.1	54.0	53.3

The OARDC reports of 2013 show 36.44 inches of precipitation in the Wooster area compared to 29.5 inches in 2012. The average rainfall is 38.9 inches for the Wooster community. For the year 2013, the area was 2.5 inches below the normal precipitation. The below average precipitation had little effect on well levels compared to the previous year.

Wooster, Ohio annual precipitation (OARDC weather station)

YEAR	TOTAL ANNUAL PRECIPITATION	CHANGE FROM NORMAL (38.9") PRECIPITATION
2003	43.2	+11.1%
2004	46.8	+20.3%
2005	34.0	-12.6%
2006	37.0	-4.9%
2007	35.4	-9.0%
2008	35.6	-8.5%
2009	34.5	-11.3%
2010	34.1	-12.3%
2011	44.9	+15.4%
2012	29.5	-24.2%
2013	36.4	-6.4%

Production of safe and satisfactory drinking water throughout 2013 was indicated by negative E-Coli bacteria results in samples of finished water collected from representative points of the distribution system. There were a total of 1247 bacteria tests completed including Wooster Distribution, new water lines, water line breaks, depressurization events, boil advisories, outside water systems, and private wells.

SOUTH WELLFIELD CONTAMINATION

Since 1985, the city has operated interceptor wells and packed media stripping towers to remove volatile organic contamination from the South Wellfield. The interceptor wells protect the City’s production wells from the contamination plume migrating further into the South production wells. In addition, the operations staff conducts a semiannual testing event of monitoring wells in and around the South Wellfield to record movement and levels of contaminants found in the ground water. Forty test wells are measured for water depth, tested for turbidity, pH, conductivity and sampled for volatile organics.

In 2013, the packed media stripping towers treated 372.4 million gallons of contaminated water then discharged into the Little Apple Creek.

SPECIAL PROJECTS COMPLETED IN 2013

- ❖ Overhauled #3 Production well in South Wellfield
- ❖ Performed touch up painting of softening clarifiers, piping in S-1 well house, halls and doorways at plant.
- ❖ Rebuilt stripper tower pumps 1-4 and modified bearings to extend service life.
- ❖ Replaced drain pump in wash recovery basin.
- ❖ Repaired roofs on S-1 & S-2 well houses.
- ❖ Pressure washed Long Road 1 million gallon storage tank to remove dirt and mildew and also protect the tank coating.
- ❖ Rebuilt soda ash chemical feeder.



Above left; Bob King uses a man lift and pressure washer to clean Long Road Water Storage Tank. Removing dirt and mildew protects the coating of the tank. ***Above right;*** Soda Ash Feeder after rehabilitation

**WATER TREATMENT PLANT
EMPLOYEE ROSTER (as of 1/1/2014)
(Certification level)**

MANAGEMENT:

Utilities Manager

Kevin Givins (WS III)

Plant Supervisor

Robert King (WS III)

LABORATORY TECHNICIAN:

Michael Shultz (WS III)

OPERATORS:

Michael Stebelton (WS III)

James Phillips (WS I)

Dave Mosher (WS II)

DJ Reichert (WS I)

Tim Breneman (WS I)

ACCOUNT CLERK (shared with PPMD):

Janell Cooper

Water Treatment Plant Goals and Objectives for 2014

- Improve unaccounted water by 20%
 - Leak detection survey of entire system twice
 - Add AMR to booster pumping stations
 - Account verification
 - Replacement of failing AMR system

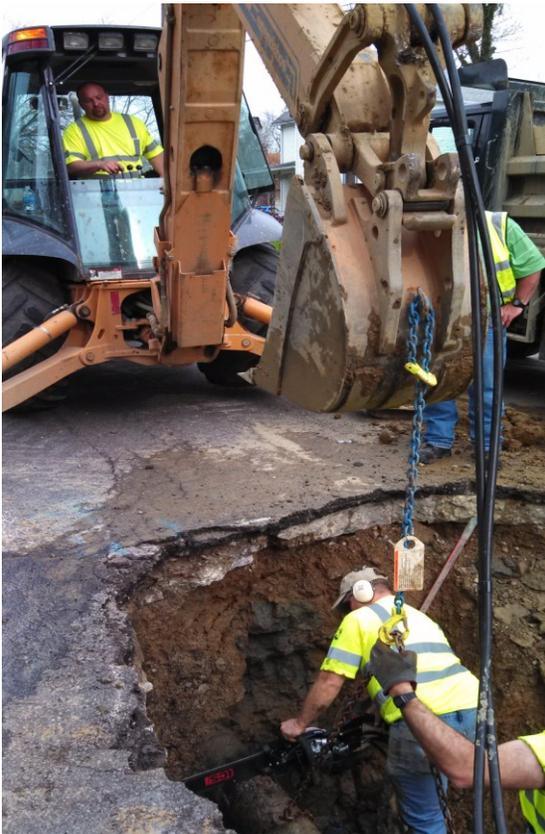
- Increase distribution turnover and improve water quality
 - Complete contract for painting and mixing equipment improvements at the Madison Hill Storage Tank
 - Modify System Pumping procedure to prevent water stagnation in system
 - Construct new tank in North High Pressure Zone

- Maintain Wellfield Reliability
 - Overhaul and rebuild #7 Production well in the North Wellfield
 - Capacity test and acidize as needed production wells at the North Wellfield

- Increase Building Maintenance of 16 year old water plant
 - Refinish floor in chemical room
 - Minor roof restoration project

Distribution/Collection/Meters

The Distribution/Collection/Meters (D/C/M) Subdivision is responsible for the maintenance and operation of all the City's underground utilities and the water metering system. D/C/M began the year as part of the Public Properties Maintenance Division where it has resided since 2010 then moved to the Utilities Division in June 2013. As part of the ongoing water loss reduction program, D/C/M completed 2 full leak detection survey rounds of the distribution system. The leak survey discovered over 50 service and main leaks that were contributing to water loss.



Distribution/Collection repaired
31 water main leaks in 2013

The meter group began the year with 1,500 transmitters no longer in contact with the data collection system. By the end of the year, that number had been reduced by 80%. The group installed a total of 4,430 transmitters and 1,708 meters. The transmitter replacement project that began in 2012 is now over 75% complete.

Other highlights of the D/C/M Group for 2013;

- 292 Water Main valves cycled
- 69 Hydrants repaired
- 86 Curb boxes repaired or replaced
- 31 Main Breaks repaired
- 1323 Hydrants flushed

- 1.55 miles of sewer mains jetted
- 4621 feet of sewer mains televised
- 2.52 miles of sewers root treated
- 663 Delinquent water shut offs
- Meters processed 5307 work orders

Distribution/Collection/Meters Goals for 2014

- 95% completion of MTU Project
- Jet 10,000 feet of sewer main
- Televis 1 mile of sewer main
- Flush every hydrant in distribution system
- Cycle 20% of main water valves
- Complete 2 leak detection surveys