

CITY OF WOOSTER

UTILITIES DIVISION

ANNUAL REPORT FOR YEAR 2009

Prepared by

James L. Borton
Utilities Manager

Kenneth S. Kinney
Assistant Utilities Manager – Treatment Plant Operations
(retiring 2/12/10)

Thomas N. Layland
Assistant Utilities Manager – Collection/Distribution

Kevin P. Givins
Assistant Utilities Manager – Treatment Plant Operations
(replacing Ken Kinney)

Contributions from

Tim Moretti
Meter Technician

Al Mower
Tradesperson

Michael Schultz
Laboratory Technician

Lee Troyer
Pretreatment Coordinator

February 2, 2010

EXECUTIVE SUMMARY

The Water Plant produced a total of 1.185 billion gallons of potable water in 2009. This total is a decrease of 62.73 million gallons from 2008. The average daily production was 3.247 million gallons with a peak of 4.25 million gallons on May 28. The average per capita usage was 122 gallons per day based on the current population estimate of 26,619.

At the Water Pollution Control Plant, 2009 was a year of improvement for the plant as operators sought to regain compliance while combating an overloaded condition and/or difficult to treat wastewaters. Throughout the year various treatment modes of operation and/or chemical addition methods were employed to allow for consistent compliance while needed capacity additions were designed and constructed. The year ended with three full months of continuous compliance carrying over to 2010 and the biotower (capacity addition) project plans approved by Ohio EPA and advertized for bids. In total the WPCP treated a total of 2.183 billion gallons of wastewater with the average daily flow being 6.00 million gallons per day receiving a peak daily flow of 22.23 million gallons on February 12, 2009. In addition the plant removed 4.55 million pounds of biological oxygen demanding (BOD) substances and 3.70 million pounds of suspended solids.

There were a total of 32 water main breaks in calendar year 2009 and over 300 valves in the distribution system were exercised as required by Ohio EPA. A leak survey was conducted twice within the Intermediate pressure zone and some suspected leaking lines resulting in over 100 miles of leak surveys conducted. There were over 754 customer service calls in relation to meter issues be them new, repair or replacements. Unfortunately, due to the economy there was an increase in delinquent account shut offs, totaling 480 vs. 402 in 2008.

During 2009 the much anticipated Frito Lay biotower project was authorized for design and construction. Ohio EPA approved the plans in December and the project was advertised on December 11 with bids opened the first week in January 2010. It is anticipated that the tower will be in full operation by the end of 2010 and bringing an end to the issues related to the WPCP upgrade.

Staffing changes occurred during 2009 in response to a shuffling of duties stemming from management changes in 2008. As such two Chief Operators were promoted, one at each treatment plant. The Chief Operators are responsible for the day to day process control monitoring and maintenance scheduling thereby allowing management to focus on regulatory, budgetary, supervision and project coordination issues. Ken Kinney announced his retirement to occur early in 2010, and in response, Kevin Givins was promoted from within the WPCP and named Mr. Kinney's replacement. The Division wishes Ken well in his retirement!

DIVISION OVERVIEW

Our mission is defined as: To protect the health and safety of the public and the environment through the use of “Best Management Practices” ensuring the safe transmission of potable water to the consumer; the return of wastewater for treatment; and continuous fire protection.

The City of Wooster Utilities Division represents a \$5.4 million business within the City of Wooster. In addition to the above, the Division through partnerships with the Engineering Department expended an additional \$6.4 million in infrastructure improvement, replacement or additions during 2009. The Division is one of the City’s enterprise funds and as such all operational or capital expenses must be covered by water and sewer rates. No general fund or tax related monies can be used to pay for operations within the Division.

The Utilities Division is comprised of two main areas; Collection/Distribution and Treatment Plant Operations. Collection/Distribution handles all pipeline concerns as it pertains to the water and sanitary sewer systems. Treatment Plant Operations is concerned with the production of drinking water and treatment of wastewater, each in full compliance with applicable regulatory requirements. Each area is staffed by highly trained, professional and in most cases Ohio EPA certified individuals. In total the Division contains 29 employees with only three classified as management, with one Division Manager and two Assistant Managers each responsible for one of the two areas. The remainder of the Division’s employees is covered by the Wooster Employees Association contract.

Operators need between 12 and 24 contact hours to renew their operator license every two years. They obtain these hours with training classes in safety, and operations. We provide each operator the time to acquire the hours needed with training in house and more advanced training outside of the city. This training gives them the hour requirements and improves their operational skills.

In recognition of our mission to utilize best management practices, the Division undertook several projects during 2009, each in an effort to maximize efficiency, lower treatment costs, to reduce water loss and to ensure compliance with environmental and drinking water regulations. Examples include, meter testing, leak location, process optimization studies, innovative treatment experiments, 360Water.com training development, telemetry radio upgrades and the design of a biotower treatment system in collaboration with our largest industrial customer.

While not everything went smoothly in 2009, the end result showed significant improvements in operational cost savings, improved Water Pollution Control Plant performance, steps toward operating both treatment plants for 16 rather than 24 hours per day and most importantly as we look toward a challenging 2010 citywide, improved knowledge on how we each do our jobs and ways to do them better.

COLLECTION / DISTRIBUTION

Our mission is defined as: To protect the health and safety of the public and the environment through the use of "Best Management Practices" ensuring the safe transmission of potable water to the consumer; the return of wastewater for treatment; and continuous fire protection.

SUMMARY

The Collection/Distribution (C/D) group is responsible for the overall maintenance and repair of the wastewater collection (sewer) system and water (drinking) distribution system, including but not limited to pipelines, valves, manholes, fire hydrants, meters and service connections. The C/D group oversees approximately 120 miles each of sewer and water lines as well as collaborating with other divisions on the maintenance of another 120 miles of storm sewers. In addition to the water lines, the group also is responsible for approximately 10,000 water meters, 2500 valves and 1200 fire hydrants citywide.

Due to an extended medical leave by the Assistant Manager for this group, 2009 started off with an interim supervisor for the unit. As a credit to the training provided by the Assistant Manager to this unit, the interim supervisor stepped into the role and was successful in leading the group for the first three months of the year. Credit also goes to the rest of the group in assuming various duties in an effort to continue normal operations. As such, this group continued to perform normally despite the void created from the extended leave.

COLLECTION SYSTEM

Wastewater Collection System - Much of the collection system located in the historic part of town is of combined sewer system setup and receives by design both storm water and sanitary wastewater. This can and frequently does create a surcharging or flooding situation in the areas served by the combined sewer system during some storm events as the capacity of the sewers are exceeded. The Utility Division has created a list of areas that require regular maintenance. These areas are failing to operate optimally due to bad joints, cracked pipes, minimum fall, or previously poor installation. Many manholes within the collection system are inspected regularly because of blockages due to poor or no channeling in the manhole.



Milan Steiner, Gary Hofstetter, Utility Division Operators, jetting sewer line using easement jetter with assistance from Ed Fitzgerald, Doheny Equipment

The CCTV sewer main line camera was purchased in 2003 and has been of great benefit to the City of Wooster as a tool to determine causes of sewer backups, potential problems, and to help make best practice decisions for sewer main replacements. The CCTV camera has been used to facilitate decisions concerning paving and roadway projects because the Utility Division personnel were able to perform system audits and establish the condition of the collection system lines prior to project planning. Long term, the entire collection system will be logged and identified through this process.

During 2009, the group accomplished the following: 6,448 feet of sewer lines televised, 10,050 feet of sewer lines were jetted to remove stoppages or debris. 29,020 feet of sewer lines treated for root infestation, and 360 feet of sanitary sewer root cutting.

The City of Wooster has many combined storm and sanitary sewers. Runoff water also infiltrates the sanitary sewers to some extent. There are 2 permitted combined sewer overflow (CSO) relief points on the sanitary sewer system, one on Bever Street and the other on Elm Street. Overflows are automatic at the Bever Street and Elm Street regulators at a given flow rate. Whenever an overflow occurs the laboratory must analyze samples for each day of the bypass for suspended solids, dissolved oxygen, and carbonaceous biochemical oxygen demand. In 2009 there were 8 Bever Street overflows, and 6 Elm Street overflows for a total of 14 bypasses. This represents a 56.3% reduction in overflow events compared to 2008 and none since the completion of the Beall Avenue sewer separation project. This is significant in that it positions the Division to comply with its CSO Long Term Control Plan as submitted to Ohio EPA.

In addition to work on the sanitary sewer system this group assists the Engineering and Maintenance Divisions with maintenance of the stormwater collection system. As such the C/D group conducted 1045 feet of televising and jetted an additional 200 feet.

DISTRIBUTION SYSTEM

The distribution system is composed of four pressure zones and each are served by a variety of storage tanks and booster stations. The four zones are: 1) South High Pressure, 2) Low Pressure, 3) Intermediate, and 4) North High Pressure.

South High Pressure Zone - The Madison Avenue Booster Station, supplying water to the OARDC storage tank, pumped a total of 59,070,700 gallons in 2009, (161,838 gallons per day average).

Low Pressure Zone - is the area located South of Bowman Street and supplied by water pumped directly from the WTP and the Long Road and Madison Avenue ground tanks. This zone used 495,794,300 gallons (1,358,341 gallons per day average).

Intermediate Zone - is the largest pressure zone in the City. It extends from Nold Ave. to the south to Oldman Road on the north. The western boundary is Oak Hill/ Normandy Dr., extending easterly to Akron Rd. The Highland, Winter and Industrial Park storage tanks, service this zone. The North Buckeye Street Booster Station pumped a total of 443,909,400 gallons in 2009 (1,216,190 gallons daily average). The water from the North Buckeye Station is pumped mainly to the Winter, Highland and Oldman storage tank service areas. The Long Road Booster Station pumped a total of 170,970,200 gallons, (468,412 gallons daily average). The Long Road Station serves the Industrial Park tank storage area.

North High Pressure Zone - The Mechanicsburg Road Booster Station pumped a total of 174,884,200 gallons (479,135 gallons per day average). The Mechanicsburg Road Booster Station supplies water to the Milltown Road tank for the area north of Oldman Road to north of Smithville Western Road, east to Melrose and Mel Lane.



Mechanicsburg Rd. Booster Station



Josie Hughes, Utility Laborer, preparing to patch water line break

There were a total of 32 water main breaks in calendar year 2009 as compared to 33 in 2008. The City of Wooster began keeping track of the number of water main breaks per year in 1970. From 1970 through December 2007 there have been 926 water main breaks. This averages out to approximately 25 breaks per year. 1970 had the lowest number of breaks at 10. The City experienced the greatest number of breaks in 2002 with 50 water main breaks, 12 breaks in December 2002 alone. The 2009 statistics fall in line with the past few years as there were 42, 39, 22, 17 and 26 water main breaks in 2003-2007 respectively.

The majority of water main breaks occur in the Intermediate Zone; approximately 85% of all breaks citywide. The water pressure in this zone ranges from 125 psi near the pump stations to 40 psi near the water towers. The Intermediate Zone is also where the majority of the cast iron

pipe resides and overall pipelines average approximately 40 years in age. Typically, water lines are designed to last 40 years using ductile iron pipe which is more forgiving to expansion and contraction issues; whereas, cast iron pipe, especially as it ages becomes more susceptible to cracking/breaking.

To assist in locating leaks that did not come to the surface the C/D group worked with a leak locating service to identify leaks. The service conducted two complete surveys of the Intermediate Zone and identified 6 leaks that were not surfacing. In addition to the area wide leak location work, the leak detection service was utilized to pinpoint known leaks that were coming to the surface in multiple areas and/or were located in proximity to other utilities and exact locations were required to prevent damage to other underground infrastructure.

In addition to water main break repairs, the C/D group is assigned the task of the overall maintenance and repair of the distribution system, including preventative maintenance and customer service issues such as service line/curbstop repairs. In 2009 the following additional tasks were completed:

- 312 Valves cycled – required by Ohio EPA
- 7 Service lines renewed
- 8 Water services severed
- 25 Curb stop/box replacements
- 6 Fire hydrants repaired
- 4 Fire hydrants replaced
- 4 Water main valves rebuilt

METER READING/MAINTENANCE

There are two employees in this subdivision and they interact daily with the Finance Department. There were a total of 92 meters installed/replaced and another 111 meter repairs made in calendar year 2009. In addition, the employees responded in total to 745 calls for service ranging from complaints from customers regarding noisy or leaking water meters to water/on or water/off requests to private plumbing contractors to locate curb boxes or terminate water service. Finally, personnel in this subdivision are responsible for discontinuing service to delinquent accounts. There was a total of 480 shut offs (discontinuation of service) in 2009 as compared to 402 in 2008. At year end approximately 86 accounts remained off due to vacancies or foreclosures.

In addition to the above service calls, in an effort to improve billing accuracy and lower the “lost revenue water” (or LRW, i.e. water pumped from the water plant but not billed) the meter group conducted meter testing with an outside consultant. The consultant utilized a calibrated meter and tested vs. the customer meters. In general most meters were within tolerance limits. Those that were out of spec were replaced thereby recovering some lost revenues.

In reviewing “lost revenue water” the City has consistently had by industry standards a higher value than its peers. While meters have been calibrated and found to be accurate or replaced to ensure improved accuracy, the remaining two reasons for the high values are undetected leaks from the system or service connections and/or unauthorized use/bypassed meters in the system. In 2009 the average LRW was 31.5%; however, it was at its lowest in August at 24.7%. Comparable sized utilities range in the 6-14% area as LRW. This continues to be a focus of

both Utilities and Finance Divisions and will remain so until LRW is brought into line with expected standards. In comparing to past years the LRW values have been 31.6%, 31.2%, 29.9%, 30.3% and 30.3% during 2008-2004 respectively.

**COLLECTION/DISTRIBUTION
EMPLOYEE ROSTER**
(certification level)

MANAGEMENT:

Utilities Manager
Assistant Utilities Managers

James Borton (WW IV, WS III)
Tom Layland (WD II, WWC II)

UTILITY OPERATORS:

Gary Hofstetter (WD II, WWC II)
Milan Steiner (WD II, WWC II)

TRADEPERSON:

Al Mower

LABORER:

Josie Hughes
Vacant
Vacant

METER TECHNICIAN:

Tim Moretti (WDII)

METER TECHNICIAN TRAINEE:

Ray Windsor (WWII, WDII)

WATER POLLUTION CONTROL PLANT

Our Mission: As a team, efficiently serve the public and protect our natural resources through proper treatment and preservation of our water resources.

SUMMARY

The year 2009 was a year of improvement for the plant as operators sought to regain compliance while combating an overloaded condition and/or difficult to treat wastewaters. Throughout the year various treatment modes of operation and/or chemical addition methods were employed to allow for consistent compliance while needed capacity additions were designed and constructed. The year ended with three full months of continuous compliance and the biotower (capacity addition) project plans approved by Ohio EPA and advertized for bids.



Water Pollution Control Plant – front right is Operations Building, left is SFD tanks, backup generator and switchgear building

TREATMENT OPERATIONS

The Water Pollution Control Plant's over-all performance in 2009 can be described as marginal yet improving. It has been well publicized that the newly upgraded WPCP emerged from its construction in an overloaded condition. The bulk of 2009 was spent in reviewing loads and their sources, evaluating chemical/biological additives and in general making process control changes in response to operational problems caused by overloaded conditions.

A total of 2.183 billion gallons of wastewater was treated during the year, with the average daily flow being 6.00 million gallons per day receiving a peak daily flow of 22.23 million gallons on February 12, 2009. The design of the facility is for 7.5 million gallons per day with a hydraulic maximum of 27 million gallons. As such the facility has room to accept new customers based on flows received.

In contrast to the wastewater treated at this facility the Water Treatment Plant produced on average 3.247 million gallons per day. The reasons for this obvious disparity of 2.753 million gallons per day between water produced and wastewater treated in 2009 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 four basic constituents, Carbonaceous Biochemical Oxygen Demand (CBOD), Suspended Solids (SS), Ammonia (NH₃), and Chemical Oxygen Demand (COD). The average daily strength of the wastewater treated at this facility in calendar year 2009 was 13,060 pounds of CBOD, 11,559 pounds of SS, 664 pounds of NH₃, and 28,923 pounds of COD. When comparing to the design of the facility, the plant is operating at 87% CBOD loading, 108% TSS loading and 75.8% Ammonia loading. It should be noted that while the plant appears to be overloaded by TSS; this situation has been addressed by reduced loadings from major customers and the cessation of belt pressing of sludges. Of more concern is the CBOD loading which during one month indicated a loading rate of 113%, plus numerous daily overloads leading to plant operability problems. In addition, the type of CBOD that is being treated has been identified as difficult to treat and in essence creates a multiplier effect.

The Ohio EPA issued NPDES Permit (discharge permit) for this facility has established a minimum removal rate of 85% for removal of specific pollutants, primarily Suspended Solids (SS) and Carbonaceous Biochemical Oxygen Demand (CBOD). The removal rate for SS for this facility in 2009 was 82.5%. The removal rate for CBOD for this facility in calendar year 2008 was 94.0%. Clearly this Plant's performance in 2009 has been severely degraded due to the on-going overload conditions.

Effluent performance early in the year suffered due to the above mentioned overload conditions. For the year average effluent performance resulted in an average of 28 mg/l TSS, 11 mg/l CBOD and 1.82 mg/l Ammonia. October through December data indicated that the plant had achieved full compliance with all parameters contained in the NPDES permit.

Of special note is that certain portions of the NPDES Permit for the WPCP remain under appeal. Specifically, the City has appealed provisions in the permit that penalize the facility for taking additional flows that assist in eliminating combined sewer overflows (CSOs). Essentially, if the plant takes a higher flow rate than the 7.5 MGD flow even if in full compliance with concentration (milligrams per liter) limits the plant would violate loading (kilograms) limits despite providing significantly more treatment than any discharge from a CSO.

Given the significant impact of industrial discharges on this plant the COD is recognized as the primary indicator of industrial organic loading on this facility. The value of 0.334 pounds of COD per person results in a population equivalent of 86,595 persons. The estimated population of the City of Wooster is 26,000. The difference between the two figures of 60,000 represents the impact of industrial discharges on this plant during calendar year 2009. The values of 0.167 pounds of BOD per person and 0.2 pounds of SS per person yield the population equivalents of 78,203 and 57,795 respectively.

The principle by-product of wastewater treatment is the production of sludge or biosolids. This facility produced 14.5 million gallons of biosolids in 2009. This represents an increase in biosolids generation for calendar year 2008 of approximately 4 million gallons. The wastewater biosolids that were applied were mixed with the spent lime from the Water Treatment Plant. This process greatly enhances the quality and quantity (actual applied dry tons) of biosolids applied to farm fields.

The WPCP is currently staffed 24 hours a day 7 days a week with at least one operations staff on duty at all times. Maintenance staff is on duty Monday through Friday.

LABORATORY SUMMARY

The EPA requires continuous monitoring of effluent quality. Lab personnel analyze for pH, suspended solids, ammonia, dissolved oxygen, carbonaceous biochemical oxygen demand, chemical oxygen demand, temperature, fecal coliform, and various sludge analyses. Contract laboratories analyze discharges for toxicity (bioassay), cyanide, hexavalent chromium, nitrates, TKN, metals, oil and grease, and organics.

The City continued the effluent surcharge program in 2008. Industries known to produce an effluent high in Suspended Solids (SS) or Chemical Oxygen Demand (COD) are sampled on a regular basis for these two parameters. In order to compensate for the additional cost of treating their effluents, surcharges are levied against those industries that exceed 481.898 mg/L of COD or 286.413 mg/L of SS.

The laboratory is required to complete Quality Assurance samples each year. We are required to select a National Institute of Standards and Technology (NIST) approved laboratory, purchase samples, analyze them, and submit the results to that laboratory. Of the fifteen (15) parameters, all fifteen (15) rated Acceptable for 2009.

INDUSTRIAL PRETREATMENT / BIOSOLIDS PROGRAM

The City is required by the NPDES permit to maintain an Industrial Pretreatment Program and a Biosolids program. Both programs are coordinated by one WPCP employee and involve the inspection, oversight and enforcement of the City's ordinances pertaining to industrial discharges to the collection (sewer) system. Simply put, various materials can not be treated at the City's WPCP and a permitting program is in place to protect the WPCP, the Killbuck Creek and local agricultural lands from potentially harmful compounds.

The City of Wooster is waiting approval from OEPA of local limits technical justification as well as modification requests to implement the new required pretreatment streaming rules. This is also a requirement of the NPDES permit.

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, other sampling is done to insure nondomestic wastewater dischargers are in compliance with local limits. Currently the city has three permitted CIU's and three SIU's and monitors three 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. Industrial user questionnaires were mailed to thirty two users to update the city's user list and assure permitting is done as required. At the time of this report, eighteen have been returned.

Due to operational problems at the sewer plant, extensive sampling was done in 2009 in an attempt to identify a suspected high strength organic loading. Frito Lay was sampled hourly for seven consecutive days in March of 2009. Other industries were also sampled for any unusually high organic loading. Background sampling was done twice in 2009, once for local limits development and the second time to assist in troubleshooting for the plant. A bio-tower at the Frito Lay discharge location has been designed and the Permit To Install (PTI) from OEPA has been approved. The tower will lower the soluble COD loading to the plant thereby correcting the organic overload condition.

Daily flow proportional sampling has been set up at Frito Lay in order to accurately determine daily loadings from their operation and see any correlations that may be present with their high organic loads and our plant violations.

EnviroClean was the only industry in Significant Non-compliance (SNC) this year. The violations occurred in the first three quarters of 2009 requiring publication in the local newspaper. A Show Cause hearing was held on September 11, 2009 with the owner and lead operator from EnviroClean and the City of Wooster's Director of Administration, Attorney, Utilities Manager and Pretreatment Coordinator in attendance.

The City of Wooster experienced no spills, interferences or pass through of toxins directly attributable to industrial discharges. The industries in our system largely are environmentally conscious. Minimum toxic chemicals are kept on site at the industries and through inspections it is noted that what is on site is contained and handled properly.

All U. S. and Ohio EPA sampling and reporting requirements for the City of Wooster's bio-solids program were met in 2009. Listed in the following table are the gallons, percent solids and dry tonnage of the Class B bio-solids that were land applied in 2009 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.

Bio-solids produced by the City of Wooster wastewater treatment plant are stored and mixed with lime sludge pumped to one of two storage lagoons from the city water plant prior to land application by Agri-Sludge, our contract land applicator. Most of the bio-solids and lime sludge mixture is injected or incorporated into the ground to avoid nuisance complaints and runoff and to meet the 40 CFR 503 and State of Ohio Sewage Sludge Rules requirements. During 2009, 14,519,550 gallons, equaling 3,596.23 dry tons of this mixture was applied to farmlands in Wayne, Holmes, and Ashland counties. Plant personnel make random unannounced inspections at some of these sites to assure the hauler maintains the required setbacks, installs the signage and follows the regulations of land application set by US and Ohio EPA.

Due to some operational problems at the wastewater plant, The City of Wooster had to waste untreated sludge to a lagoon from the treatment process. This lagoon was isolated and a portable belt press was brought in. The belt cake was land-filled while the filtrate was routed back to the plant. A total of 145.41 dry ton of cake was hauled to a landfill in June, July and August.

The City of Wooster received no nuisance complaints or interferences from the treatment, storage, staging, transport or application/disposal of the biosolids in 2009.



Final clarifiers at WPCP

WATER POLLUTION CONTROL PLANT
EMPLOYEE ROSTER
(certification level)

MANAGEMENT:

Utilities Manager
Assistant Utilities Managers

James Borton (WW IV)
Ken Kinney
Kevin Givins (WW III)

LABORATORY TECHNICIANS:

Greg Funk (WW III)
Michael Shultz (WW III)

PRETREATMENT/BIOSOLIDS COORD.:

Lee Troyer (WW III)

CHIEF OPERATOR:

Steve Carathers (WW III)

OPERATORS:

Gary Palmer (WW I)
D.J. Reichert (WW II)
Larry Rouhier (WW IV)
Adam Wilford (WW II)

OPERATOR TRAINEE:

Vacant

PLANT MECHANIC:

Bob King (WW I)

INSTRUMENTATION TECHNICIAN:

Don Macko

CLERK TYPIST:

Janell Cooper

WATER TREATMENT PLANT

Our mission is defined as: A commitment to excellence in public service through the proper treatment, protection and preservation of water resources.

SUMMARY

2009 has been a good year for the Water Production Plant. All treatment processes are operating in compliance. Beginning in 2008, the remodeling of Buckeye and Mechanicsburg Booster Stations began. This will replace 1940's equipment in Buckeye, increase the efficiency of the station and add a generator for back up power. Construction began on the new one million gallon elevated water tank in the Intermediate Zone which will increase storage capacity and supply the Mechanicsburg Pump Station. Both of these projects were completed in 2009. The city has an ample supply of raw water for many years and now will have ample storage for treated water. Another project started in September, was the replacement of the radios that the telemetry system operates on. Because of communication problems in 2009, it was decided to replace the radio system, which should be finished in early 2010 by Status Control & Integration, Inc.



Softening unit/clarifier inside Water Treatment Plant

TREATMENT OPERATIONS

The City of Wooster's Water Treatment Plant (WTP) continues to perform well and had no treatment technique or maximum contaminant level exceedance/violation in 2009. This represents the level of professionalism within the staff at WTP as well as the availability of

necessary resources and tools to properly treat water for the citizens of Wooster and several bulk water customers.

Finished water pumped to the city in 2009 decreased by 62.7 million gallons from the previous year. An average of 3.279 million gallons per day of raw water from our well fields was treated in 2009. The high duty pumps sent an average of 3.247 million gallons per day of finished water into the distribution system. The peak-pumping day occurred on May 28 when 4.25 million gallons of finished water was pumped into the city. The average per capita usage of water in 2009 was 122 gallons per day (based on population data of 26,619).

The chemical cost per million gallons of treated water in 2009 was \$211.43. The increase from the previous year (\$193.45) was due to increased chemical cost.

Avg. chemical cost per million gallons

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

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

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

Sludge, a byproduct of the lime and soda ash softening process, is pumped to the sludge lagoon at the Water Pollution Control Plant. There was 10.663 million gallons of lime and soda ash sludge pumped to the WPCP in 2009.

The plant used 17.931 million gallons (49,126 gallons per day average) of treated water to backwash the plant's four filters. The backwash water is recycled back to the beginning of the treatment process to conserve water.



S-1 Well with VOC stripper tower in background

The city well fields continue to provide sufficient water. The North Well Field average water level was 31.4 feet. Its lowest level was in November at 23.0 feet, and the high was at 41.1 feet in March. The S-1 Well in the South Well Field averaged 38.3 feet of water peaking at 45.4 feet in

April and a low of 34.2 feet in September. The S-2 Well in the South well field averaged 42.8 feet, peaking at 53.6 feet in April, and a low of 32.3 feet in August. The S-3 Well averaged 59.3 feet, peaking at 60.1 feet in April to a low of 49.5 in S. The North Well Field is capable of only maintaining a production of 1.8 million gallons per day. The S-1 Well is pumped continually at 1.5 to 1.8 million gallons per day. Both S-2 & S-3 Wells are approved at 3.5 MGD.

Average water well levels (in feet)

WELLS	2003	2004	2005	2006	2007	2008	2009
North Well Field	23.2	28.6	30.3	29.9	31.0	33.2	31.4
South Well Field S-1	54.4	64.5	60.4	58.8	58.8	40.2	38.3
South Well Field S-2	28.5	54.8	46.1	43.2	43.2	45.1	42.8
South Well Field S-3					54.1	54.1	59.3

The OARDC reports of 2009 show 34.5 inches of precipitation in the Wooster area compared to 35.6 inches in 2008. The average rainfall is 38.9 inches for the Wooster community. For the year 2009, the area was 4.4 inches below the normal precipitation. The average water level for 2009 has dropped .2 feet from 2008.

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%

Production of safe and satisfactory drinking water throughout 2009 was indicated by negative E-Coli bacteria results in samples of finished water collected from representative points of the distribution system. There were 394 routine compliance bacteria samples taken. Another responsibility of our division is checking for bacteria in new lines installed within the city before they are put into use, where 128 samples were collected and analyzed. There were 65 samples taken for water break repairs and special residential sampling to ensure all the repaired lines were safe for our consumers. The plant also performed bacteria tests on 578 outside samples.

SOUTH WELLFIELD CONTAMINATION

In July 1983, VOC contamination was found in the S-1 Well. S-1 Well was not used for consumption until November 1998, when it was operated to test the new water plant. The S-1 Well has been approved for use when operated with the plant water stripping towers. The S-1 Well is currently used for consumption on a daily basis with flow rates ranging from 1.2 to 1.5 million gallons per day.

The clean up process of the contamination plume has been in operation for 24 years, operating #1 Interceptor Well and Tower since 1985 to 2007. The #1 Well and Tower has been replaced with a larger #7 Well and Tower.

The new #7 Interceptor Well (I-7) is located farther north of #1 in an area found to contain higher residuals of VOCs. The operation of #7 Interceptor Well will capture more of the VOCs and provide better protection for the city's drinking water wells to the south. The residuals of VOCs in I-7 are Cis-1,2-Dichloroethene at 57.0 ug/l and Vinyl Chloride at 3.5 ug/l. A total of 248 million gallons was pumped, treated and released into Little Apple Creek Stream.

The #2-3-4 Interceptor Wells have been in use for 19 years. The residuals of VOCs detected were Trichloroethene at 64.0 ug/l and Cis 1, 2-Dichloroethene at 10.9 ug/l. All effluent water from the stripping tower was reduced to < 0.5 ug/l, which is the lowest detection level of the lab. A total of 68.9 million gallons was pumped through the #2 Stripper Tower in 2009 and released into Little Apple Creek Stream.

The S-1 Well is now used as a production well and interceptor well by collecting VOCs moving south and to the west of its location. Residuals of VOCs in S-1 Well detected before stripping are Cis-1,2-Dichloroethene at 5.2 ug/l and Vinyl Chloride at 2.3 ug/l. All effluent water was reduced to < 0.5 ug/l. A total of 501 million gallons was pumped from S-1 Well in 2009. All the water was treated in the plant's stripping towers.

To further protect production wells S-2 and S-3, #6 Interceptor Well was added southeast of the plant and west of Prairie Lane. The operation of #6 Interceptor Well will capture contaminants migrating from the east toward the well field. A new #6 Stripping Tower was constructed at the S-1 Well location to remove the VOC residuals of Cis-1,2-Dichloroethene at 7.8 ug/l and Vinyl Chloride at 2.0 ug/l. A total of 105.4 million gallons was pumped from #6 Interceptor Well, treated and released into Little Apple Creek Stream. The addition of #6 and #7 Interceptor Wells will provide an improved capture zone to collect VOCs and protect S-1, S-2 and S-3 Wells.

**WATER TREATMENT PLANT
EMPLOYEE ROSTER**
(certification level)

MANAGEMENT:

Utilities Manager
Assistant Utilities Managers

James Borton (WS III)
Ken Kinney (WS III)
Kevin Givins (WS III)

LABORATORY TECHNICIAN:

Michael Shultz (WS III)

CHIEF OPERATOR:

Robert Lance (WS III)

OPERATORS:

Glenn Bower (WS I)
Jeffrey Long (WS III)
Michael Stebelton (WS II)
James Phillips (WS I)
Rod Musser (WS III)
Dave Mosher (WS II)

PLANT MECHANIC:

Vacant

INSTRUMENTATION TECHNICIAN:

Don Macko (WS III)

CLERK TYPIST:

Janell Cooper