

CITY OF CRYSTAL LAKE PUBLIC WORKS DEPARTMENT



ANNUAL REPORT

2015

Gary Mayerhofer, City Manager
City of Crystal Lake

Mr. Mayerhofer:

It is with great enthusiasm that I present the City of Crystal Lake Public Works Department Annual Report. 2015 was a year of great progress and accomplishment for our Department. These accomplishments would not have occurred without your unwavering support for our vision and mission. Through this support the Department was able to provide countless Public Works services for the residents and businesses of our community. In addition, while we have experienced transition with staff, we have been able to advance our Department in many respects. For example, the evaluation of duties such as the Emerald Ash Borer (EAB) infected tree replacement program, found that outsourcing this task is very cost effective. During the upcoming year, we will continue to review other programs to determine if other cost effective measures are viable.

However, before we move forward, it is important to look back and review our 2015 accomplishments. The following will highlight such accomplishments:

- Administrative coordination of the Wastewater Treatment Plant #2 and #3 improvements. Baxter & Woodman will oversee the engineering and construction, while Williams Brothers Construction, Inc. will handle construction services. This project also includes administration of the IEPA Loan.
- Over 1,600 EAB infected trees were removed. Of the over 6,000 infected trees that were planned for removal in 2012, only 384 infected trees remain for removal.
- The Water & Sewer Division met all EPA standards and no EPA violations were issued. In addition, this Division won the Fluoridation Award for maintaining perfect compliance with the State of Illinois Fluoridation Award for 12 consecutive months and 20 consecutive years.
- The Fleet and Facility Division received the honor of being ranked 59th best fleet in North America by the 100 Best Fleets organization.
- The Fleet and Facility Division coordinated the purchase of 11 replacement fleet vehicles for not only our Department but for the Police and Fire Rescue Departments as well.

These are just a few accomplishments that will be further discussed in this Annual Report. As we move into 2016, I look forward to working together with the City Council and City Staff to continue our progress as well as ensuring our residents and businesses have the highest level of Public Works service in McHenry County and across the region. On behalf of the Public Works Department, it is with great pleasure that I present our 2015 Annual Report.

Sincerely,



Victor Ramirez, P.E.
Director of Public Works

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Public Works Staff

Administration

Victor Ramirez, Director

Denver Schmitt, Assistant to the Director

Beth Mogan, Administrative Assistant

Kelly Olbrich, Administrative Assistant

Michelle Szutkowski, Administrative Assistant

Wastewater Division

Dan Langguth, Superintendent

Sam Ferraro, Supervisor

Emma Kohl, Lab Supervisor

Kenneth Krueger, Pretreatment Coordinator

Adam Behrns, Program Coordinator

Brian Campion, Facility Operator

Dan Click, Facility Operator

Russell Hornung, Maintenance Worker

Jeffrey Lundy, Maintenance Worker

William Martenson, Maintenance Worker

Daniel Oates, Maintenance Worker

Kelsey Snell, Maintenance Worker

Water & Sewer Division

Andrew Resek, Superintendent

John Pavlis, Supervisor

Sean Park, Supervisor

(Water & Sewer Continued)

Matt Victorine, Program Coordinator

Tim Behrens, Maintenance Worker

Peter Beer, Maintenance Worker

Greg Cook, PWS Operator

Joe Gallina, Maintenance Worker

Ed Harrison, Maintenance Worker

Eric Penkava, Maintenance Worker

Joe Ryan, Maintenance Worker

Dan Seymore, Maintenance Worker

Raymond Shine, PWS Operator

Rick Stoddard, Maintenance Worker

Ken Stoerp, Maintenance Worker

Terry Utech, PWS Operator

Tom Warner, PWS Operator

Steve Wolf, PWS Operator

Fleet and Facility Division

Don Christenson, Superintendent

Ernie Hagenow, Program Coordinator

Jason Heisler, Auto Tech

Wayne Markgraff, Auto Tech

Keith Patchik, Auto Tech

Dan Slove, Auto Tech

Streets Division

Larry Zurek, Superintendent

Jim Veugeler, Supervisor

Dave Oerkfitz, Program Coordinator

Tony Ramirez, Program Coordinator

Tom Aellig, Maintenance Worker

Robert Aleman, Maintenance Worker

Kevin Austin, Maintenance Worker

Chris Blum, Maintenance Worker

Glen Floress, Maintenance Worker

Don Huffar, Maintenance Worker

Sean Parkin, Maintenance Worker

Ron Pieroni, Maintenance Worker

Tony Polizzi, Maintenance Worker

Rodney Rogalski, Maintenance Worker

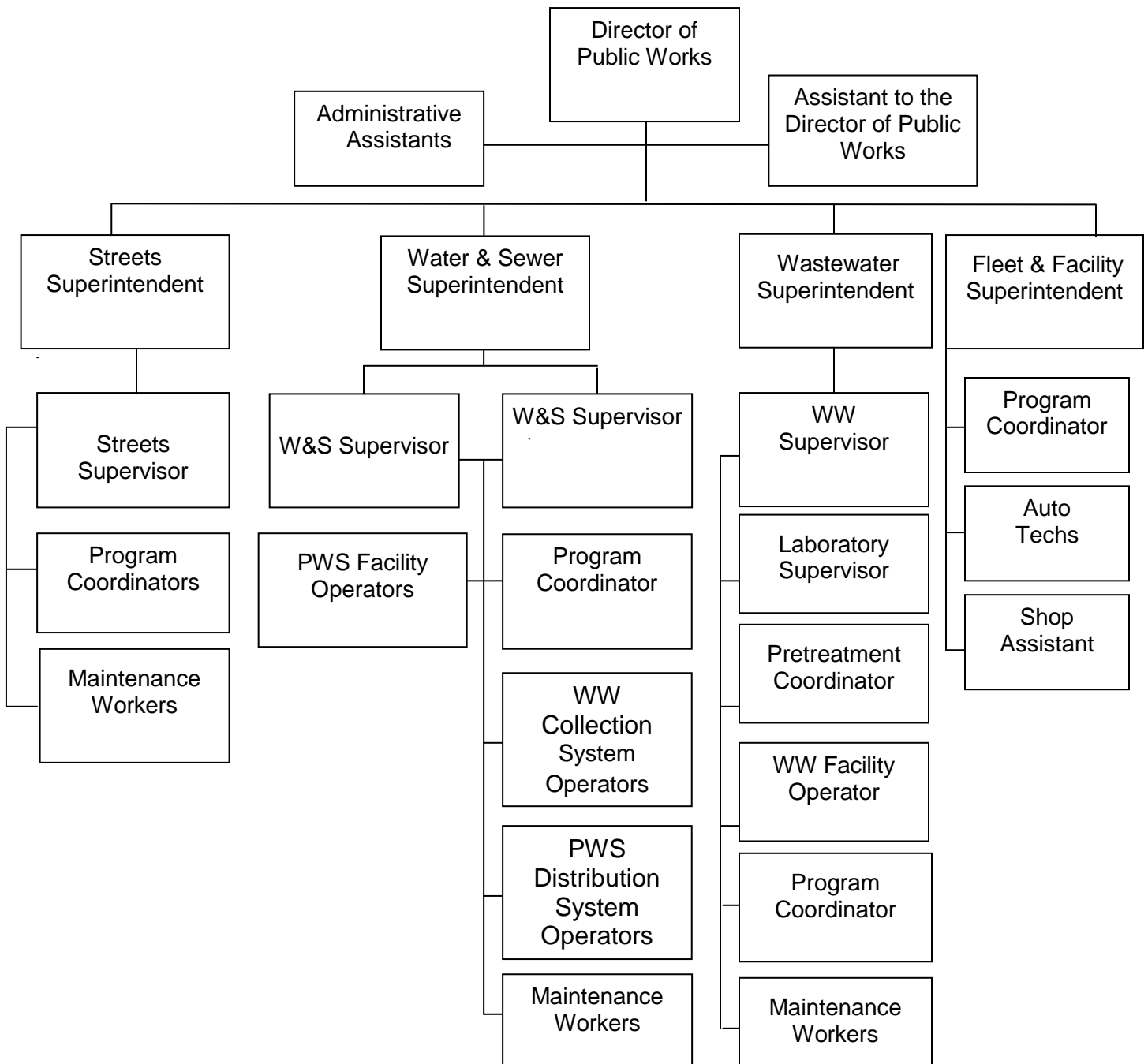
Dave Shine, Maintenance Worker

Gary Tegtmeier, Maintenance Worker

Rick Utech, Maintenance Worker



Organizational Chart



New Employees



Michelle Szutkowski joined the City in January 2015 as an Administrative Assistant. She previously worked for the Naperville Park District.



Sean Park joined the City in March 2015 as a Water & Sewer Supervisor. He previously worked for the Village of Cary.



Denver Schmitt joined the Department in April 2015 as the Assistant to the Public Works Director. He was promoted from the City of Crystal Lake Police Department.



Sam Ferraro joined the City in October 2015 as a Wastewater Supervisor. He previously worked for the Village of Bloomingdale.

Training

Training is a very critical aspect of Public Works. Our staff is routinely involved with training. At times this includes collaborating training with other City Departments so training opportunities can be shared with other City employees. Proper training is crucial to ensure our staff remain safe and ensure the City's liability for accidents and injuries remains as low as possible. Here are some examples of training that occurred in 2015:

- Development Dimensions International (DDI)-McHenry County College
 - Administrative Assistants attended from February-April
 - Topics included Communicating with Impact, Taking the Heat, Personal Empowerment, Navigating Beyond Conflict, and Business Writing and Email Etiquette
- Respirator and Fit Testing
 - All applicable Public Works staff attended in April
- Coaching the Maintenance Vehicle Operator-IRMA
 - All applicable Public Works staff attended in May
- Fire Extinguisher Training-Crystal Lake Fire Rescue Department
 - All Public Works staff attended in September
- Electrical & Hazcom Training-LoMastro & Associates
 - All applicable Public Works staff attended in October
- Snow Plow Training-In-house instruction
 - All snow plow drivers attended in October
- Back Ergonomics-IRMA
 - All applicable Public Works staff attended in November
- Command & General Staff Functions for Local Incident Management Teams-Illinois Fire Service Institute
 - Members of the management team attended in November
- A Conversation with the Unions-IPELRA
 - The Public Works management team attended in December



Administration Division

The Administration Division oversees the Streets, Water and Sewer, Wastewater and Lift Stations, and Fleet and Facilities Divisions to ensure the highest quality services are provided to City residents and businesses. The Division works directly with elected officials, other City departments, contracted legal staff, bargaining unit representatives and community members. Other duties performed by this Division include short and long term planning through the operating and capital budgets, project management and oversight, staff acquisition and development, as well as ensuring the Department is adhering to policies, procedures, and the bargaining unit contract.

The Public Works Department experienced several transitions in 2015, with many impacting the Administration Division. For example, one of our Administrative Assistants and Assistant Public Works Director both resigned. The Administrative Assistant position was rehired and the Assistant Public Works Director position was reclassified to an Assistant to the Public Works Director position, who was promoted internally. In addition, the Administrative Division coordinated the promotion of a Wastewater Superintendent due to vacancy, the hiring of a Water & Sewer Supervisor due to vacancy, as well as a Wastewater Supervisor which was vacant due to a promotion. In addition, the Department as a whole was still transitioning from five Divisions being reorganized to four. The now dissolved Sewer and Lift Stations Division was merged into two separate Divisions: Wastewater Division and the Water and Sewer Division. Despite changes to our management team and operational Divisions, the Administrative Division was able to realize many accomplishments. Such accomplishments included:

- Victor Ramirez received the APWA Chicago Metro Chapter - Top Ten Award, which recognizes outstanding service in the field of public works.
- Enhanced document management procedures by using the Optiview scanning software.
- Initiation of the NW area sanitary sewer capacity analysis.
- Fully incorporated the City's BidSync software, which is an electronic platform for City bids and RFPs; to date the Department has entered fifteen projects into this new system.
- Coordination of the IEPA Loan for the Wastewater Plant #2 and #3 projects. These projects were contingent on this loan which has been approved by the IEPA. The City was able to receive an outstanding interest rate of 1.85%.
- Review and oversight of plans for sewer and water system additions and improvements.
- Implementation summer and winter helpers into the operating Divisions on a scale that exceeds any previous year to supplement the workforce and advance special projects.
- Worked with Clarke Environmental to administer the City's Mosquito Abatement Program.

Wastewater Division

The Wastewater Division maintains two wastewater treatment plants, twenty-seven sanitary lift stations and three storm water lift stations. The Division is responsible for meeting all NPDES effluent permit limitations at each wastewater plant. In addition, staff operates and monitors the thirty lift station facilities throughout the City. Consisting of twelve employees, the Division handles operating, inspecting, repairing and performing routine maintenance at the City's wastewater plants and lift stations.

Wastewater Plants #2 & #3

Wastewater Division staff is responsible for the treatment of the City's wastewater and ensuring all NPDES effluent permit limitations are being met continually. This is an extension of a public health service provided to all users of the area's water supply. On average, the City treats 4.7 million gallons of wastewater each day (M.G.D.). In 2015, the Division treated 1,669,700,000 total gallons of wastewater.

WWT Table A: Capacity and intended use of each wastewater treatment facility

	Plant #2	Plant #3
Plant Capacity	5.8 M.G.D.	1.8 M.G.D.
Average Daily Flow	4.1 M.G.D.	0.6 M.G.D.
Sampling Requirement	3 times per week	1 time per week
Facility Type	Activated Sludge Plant	Trickling Filter Plant
Last Construction Completed	2003	1995

WWT Table B: Amount of effluent that was processed by the Division in 2015 (Million Gallons/Day)

	WWTP #2	WWTP #2	WWTP #3	WWTP #3	Combined	Combined
	Monthly (M.G.D.)	Daily Avg. (M.G.D.)	Monthly (M.G.D.)	Daily Avg. (M.G.D.)	Total (M.G.D.)	Daily Avg. (M.G.D.)
Jan-15	116.91	3.77	15.87	0.512	117.40	4.28
Feb-15	111.55	3.50	17.86	0.638	129.40	4.14
Mar-15	137.26	4.42	17.81	0.575	155.00	5.00
Apr-15	136.90	4.56	16.73	0.558	153.60	5.12
May-15	148.81	4.80	14.99	0.484	163.80	5.284
Jun-15	151.05	5.03	13.78	0.459	164.83	5.489
Jul-15	170.05	5.48	15.24	0.492	185.29	5.972
Aug-15	129.74	4.18	14.27	0.46	144.01	4.64
Sep-15	124.78	4.16	16.29	0.543	141.07	4.703
Oct-15	118.57	3.82	16.32	0.527	134.89	4.347
Nov-15	141.34	4.71	17.33	0.578	158.67	5.288
Dec-15	190.88	6.15	17.94	0.579	208.82	6.729
Total/Avg.	1,677.84	4.55	194.43	0.53375	1,669.70	4.714

Recent Upgrade Improvements at WWTP #2 & WWTP #3

In 2013, HR Green, Inc. was contracted by the City of Crystal Lake to evaluate its existing wastewater treatment operations and to develop a 20-year Wastewater Treatment Master Plan. A condition assessment of each wastewater treatment plant was conducted to evaluate both the current and useful life expectancy of each of the facility's components. The objective of the Master Plan was to develop a 20-year planning document and capital planning tool. The summary of improvements at each wastewater plant were prioritized based on critical need and are being completed in stages as capital funding allows. The following is a list of improvements completed at Wastewater Plants #2 & #3 during the 2015 calendar year:

Wastewater Treatment Plant #2

1) Turbo Blowers: In 2015, two high efficiency turbo blowers were installed to replace existing 14 year old centrifugal blowers. These new blower units are newer technology that provides air to the aeration tanks while utilizing significantly less energy than the existing centrifugal blowers. Since being placed into operation, wastewater staff has seen an approximate 30% reduction in Plant #2 electrical costs.



2) Blower Building Motor Control Center (MCC) Replacement: In January of 2014, the Wastewater Division experienced malfunction issues with Blower #4. It was determined the bucket stabs and buss bars were inoperable which caused operational issues. Temporary repairs were made to the equipment as an emergency response. A secondary inspection was conducted on the other three MCC buckets and revealed the existing bucket stabs and buss bars were nearing the end of their useful life. The

existing MCC equipment was approximately 44 years old and parts are obsolete. Due to these issues, a new MCC was installed in conjunction with the new turbo blowers.

3) Primary Clarifiers Hydraulic Improvements: The existing layout of the influent channel into the primary clarifiers was susceptible to preferential flow patterns which lead to unbalanced loadings in the separate clarifiers. Stainless steel baffle plates were installed in strategic locations of the influent channel to correct the imbalance issues.





4) Final Clarifiers Hydraulic Improvements: A review of the existing 30" effluent piping from secondary clarifiers #1 - #4 determined a flow constriction going to the sand filter building. To correct this issue, a 36" effluent pipe was installed for clarifiers #2 - #4. This upgrade has increased the effluent piping capability which reduces solids overflow from the secondary clarifiers in high flow events.

5) Sand Filter Building and Ultra Violet Disinfection Unit By-Pass Structures: To assist operators in high flow conditions, a 36" sand filter by-pass and associated piping was constructed to reduce excessive hydraulic loading to the sand filter influent. Additionally, an ultraviolet (UV) by-pass channel was also constructed. New IEPA guidelines require the ability to by-pass disinfection. These improvements allow regular Operations and Maintenance (O&M) to be completed in these areas.

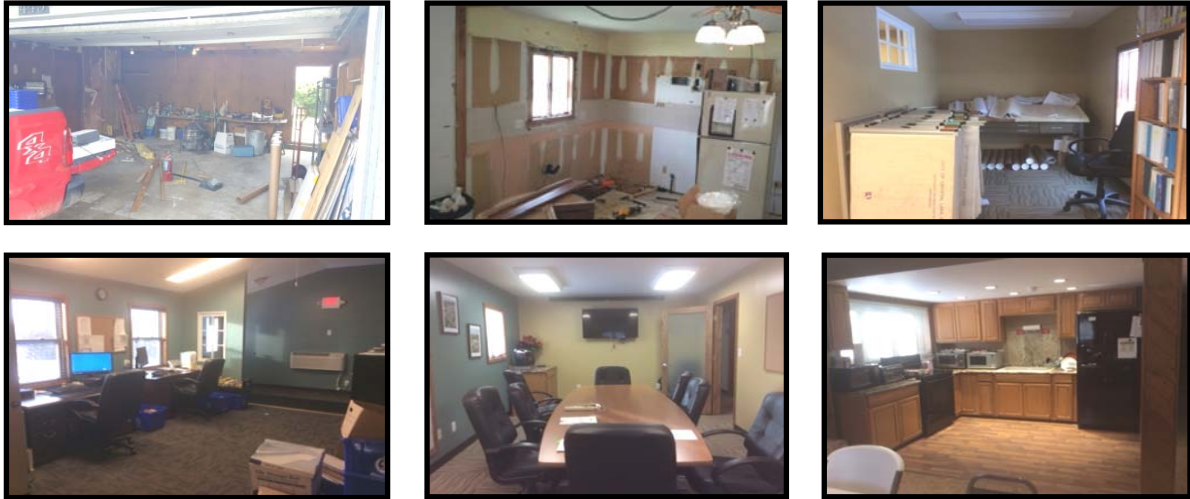


6) Return Activated Sludge (RAS) Pumps #4, #5 and #6 Replacement: A review of the six existing RAS pumps determined they were in poor condition and required replacement. Pumps #4, #5 and #6 were replaced with Flygt dry pit submersible pumps. These pumps have a higher pumping capacity than the existing pumps requiring only two pumps to be operational rather than three. Maintenance costs are also reduced due to being single packaged pumps (pump and motor contained in one unit). In addition, a variable frequency drive was added to RAS pump #6 to reduce electrical costs and ensure even pumping return sludge flows.



7) Wastewater Office Building Upgrade: In 2014, the Public Works Division was restructured to be more efficient. Wastewater staff was transferred responsibility for the City's lift stations which increased the number of staff members from 8 to 12. Due to this increase, the existing single family home being utilized as the Wastewater Division offices quickly became over

crowded with significant space reductions. The building required restructuring in order to utilize all available space and make it functional for all 12 staff members. In order to accomplish this, staff gathered contractor quotes which exceeded \$200,000. It was determined the upgrades could be done in-house with plant staff and was completed for under \$60,000. The building is now able to house all 12 staff members comfortably and flows better operationally. This new space will serve the Divisional needs for many years.



Wastewater Treatment Plant #3

1) Lift Station #12 Building Upgrade & Influent Screen Installation: A review of Lift Station #12 and its pretreatment equipment determined that the existing channel grinder was at the end of its operational life and pump clogging issues were common downstream at the wastewater plant. In response, a new mechanical screen and compactor were installed at the station. The installation of the new screen has increased the reliability of the equipment and increased the capture rate of rags and foreign materials while also reducing pump plugging issues at the treatment plant.



2) Plant #3 Upgraded Office Area / Break Room: As part of the upcoming improvements at WWTP #3, an additional motor control center (MCC) and blower variable frequency drives (VFDs) will be installed in the existing MCC room. These additions did not leave adequate space

in the MCC room to house the operator office area or break room. Because of this, staff utilized a portion of the existing unfinished garage to construct a new office area and break room. This upgraded area is now able to house 2-3 staff members comfortably.



3) Primary Effluent Pumping Station (PEPs): A review of the six existing primary effluent pumps (PEPs) determined they were in poor condition and required replacement. A condition summary of each pump was conducted and a replacement schedule was developed to prioritize the replacement of each pump based on critical need and as capital funding allows. Pumps #1 and #6 were replaced in 2015. Wastewater staff continues to compare options between rebuilding existing pumps compared to purchasing new ones. During such analysis, wastewater staff factor in the age of the existing pump, cost of repair parts and labor and compared those costs to a new replacement pump.



Wastewater Treatment Laboratory



Laboratory analytical testing is completed on wastewater influent and effluent flows at both plants. Staff operates at a very high level ensuring analyses are performed above set standards. Operation staff is updated by the Wastewater Laboratory Technician on analytical testing results that may be out of the ordinary or have yielded results that were slightly lower or higher than anticipated so operational changes can be made quickly. Laboratory personnel also ensure all required DMR discharge permit "Special Conditions" and NPDES permit limits are met. Some of the analytical testing required is bio-oxygen demand (BOD), PH, suspended solids, phosphorus, ammonia nitrogen, barium, dissolved oxygen, chlorine residual and fecal coliform. On occasion, the Wastewater laboratory also completes analytical testing for the Water & Sewer Division. In 2015, over 3,150 analytical tests were performed and recorded in-house by wastewater laboratory staff.

Pretreatment Program

Crystal Lake is one of 1,600 publicly owned treatment works across the country that is required to implement local Pretreatment programs. The City of Crystal Lake has an approved pretreatment program which has been incorporated into our National Pollutant Discharge Elimination System (NPDES) Permit. Therefore the City is classified by the United States Environmental Protection Agency (USEPA) as the Control Authority (CA) as defined in 40 CFR 403.12(a). The City of Crystal Lake has two sanitary treatment plants and two NPDES permits, which receive industrial, commercial and domestic wastewater for treatment. The City also accepts wastewater from the Village of Lakewood.



The City of Crystal Lake is required by law to implement and enforce its approved Pretreatment Program and all approved subsequent modifications which were approved on June 28, 1985. As documented in both NPDES permits, the City is required to adequately maintain legal authority to fully implement the Pretreatment Program in compliance with Federal (40 CFR 403), State, and local laws. The City, acting as CA, must follow a series of guidelines or “Special Conditions”. These “Special Conditions” are documented in both of the NPDES permits. The National Pretreatment Program’s authority comes from section 307 of the Federal Water Pollution Control Act (known as the Clean Water Act). The federal government’s role in the pretreatment began with the passage of the Clean Water Act in 1972. The Act called for the EPA to develop national pretreatment standards to control industrial discharges into sewerage systems. The program was designed to reduce the level of pollutants discharged by industry and other non-domestic wastewater sources into municipal sewerage systems, and thereby, reduce the amount of pollutants released into the environment through wastewater. The objectives of the program are as follows:

- To protect the Publicly Owned Treatment Works (POTW) from pollutants that may interfere with plant operations
- To prevent pollutants that may pass through untreated from being introduced into the POTW
- To improve opportunities for the POTW to reuse wastewater and sludge that is generated in the treatment process

Sewer Use Ordinance and Local Limits: All dischargers are controlled by the use of the City’s Sewer Use and Pretreatment Ordinance (No. 6465). The ordinance sets forth uniform requirements for users of the publicly owned treatment works for the City of Crystal Lake and enables the City to comply with all applicable State and Federal laws, including the Clean Water

Act (33 United States Code 1251 et seq.) and the General Pretreatment Regulations (40 CFR Part 403). The ordinance authorizes the following:

- The issuance of wastewater discharge permits; provides for monitoring, compliance, and enforcement activities
- Establishes administrative review procedures; requires user reporting; and provides for the setting of fees for the equitable distribution of costs resulting from the established program

The most recent technical evaluation to establish local limits was conducted from 2010 - 2013. The evaluation was conducted at both wastewater treatment plants and various industrial, commercial and domestic source locations throughout the City.

The local limits were calculated for each wastewater plant separately and the most stringent parameter limit from each plant was evaluated. All parameters were compared to determine the most stringent limit that is proposed to be adopted for each pollutant.

As documented in the local limits report, this methodology provides the most protection to the City and prevents the use of two separate sets of limits which would increase pretreatment costs.

The reasoning for this approach also discourages businesses from moving from one discharge service area of the City to the other in order to obtain a higher sewer use limit. Most businesses in Crystal Lake are cooperative in following environmental regulations.

The City received an approval letter from the USEPA for their local limits report on March 30, 2015. This approval letter applies only to the local limits report. The City received subsequent letters from the USEPA on June 17th and October 15th requiring revisions to their Sewer Use Ordinance. The City has made the required revisions and submitted the updated Sewer Use Ordinance to the USEPA on December 18th, 2015. After the USEPA has approved the revisions, the Sewer Use Ordinance will be placed on a thirty-day public review. Once the public comment period ends with no concerns identified, the City Council can approve the new Sewer Use Ordinance.

Other Notable Pretreatment Items: Wastewater staff expanded its Fats, Oils, and Grease (FOG) Program in 2015. The City has, or is in the process of, inspecting every food establishment in Crystal Lake. This includes every restaurant, school, nursing home or business that makes food and has the potential to discharge grease to the sanitary sewer system. Inspections will be conducted every year depending on current findings. The yearly review will determine the priority and need to inspect the food establishments.

The City submits an annual Pretreatment Report to the USEPA and the IEPA. The report summarizes the year's pretreatment activities for all businesses with a priority on the permitted facilities in Crystal Lake.

Lift Stations

The Wastewater Division is responsible for the management and maintenance of the City's twenty-seven (27) sanitary lift stations and three (3) storm water lift stations. The City uses a gravity based system to transport wastewater to the treatment facilities. In these sewer systems, the pipes run downhill, allowing the water to flow using the force of gravity. Periodically throughout the system, there are lift stations that pump the water up a pipe to a higher elevation. From that point, the waste continues its journey downhill until it reaches another lift station or the treatment plant facility.

Most of the City's wastewater lift stations are comprised of a "wet well" containing submersible pumps. Five lift stations in the City have a "dry well" that contain pumps, valves, pipes and electrical systems one story underground. Lift station designs incorporate level-sensing equipment, including ultrasonic level transmitters, bubblers, pressure transducers and floats. Stand-by generators provide emergency power to lift stations to ensure the proper pumping of wastewater during a power outage. If the lift station does not have onsite power generating capability, a trailer-mounted portable generator may be connected to the station. Ten of the City's wastewater lift stations are monitored for condition, status and alarm conditions by a computer-based Supervisory Control and Data Acquisition (SCADA) system. The SCADA system consists of a PC-based central computer system located at the City's Wastewater Plant #2 that communicates with the remote telemetry units located at each wastewater lift station. The SCADA system gathers information, such as high wet well levels, failed pump or generators and relays this information back to the main SCADA server alerting wastewater personnel that a problem has occurred. The SCADA system affords Wastewater Division staff the ability to monitor the lift stations and make minor pumping modifications from remote locations, shortening response times to inferior conditions or emergency situations.

Lift Station Pump Maintenance

It's the intention of Wastewater staff to reduce and ultimately eliminate any and all sanitary sewer overflows (SSO) and basement back-ups. Each year, the Wastewater Division pulls all submersible pumps for cleaning, routine maintenance and inspection. During this time, the Division inspects each pump to ensure that it is working properly and that there are no signs of worn parts or pump deterioration. By inspecting the pumps in such a way, the Division can be confident that when they are called upon, the pumps will be able to perform for extended periods of time and in adverse conditions. Being in a harsh, wet environment can take a toll on such mechanical equipment. This is why it's crucial for the life of the pump that such maintenance checks and cleanings occur on a regular basis.

Recent Upgrade Improvements at Lift Station Facilities

1) Grounding and Bonding at Lift Stations #8, #10, #16, #17 & #22: Due to lift stations exclusively handling water, grounding is of the utmost importance. The intention is for all metallic parts to be bonded to avoid a shock hazard should personnel be in contact with multiple surfaces during a fault. Wastewater staff plan to have every station completed prior to the end of the 2015-2016 Fiscal Year.



2) Lift Station #8 and #19 New Submersible Pump Installations: As noted above, properly operating pumps are critical for the lift station facilities. Recent inspections determined pump replacements were warranted at Lift Stations #8 and #19. In making these determinations, wastewater staff factors the age of the existing pump, cost of repair parts and labor, and compare that to the price of a new replacement pump.



3) Lift #17 Supervisory Control and Data Acquisition (SCADA) Installation: This lift station is now monitored for condition, status and alarm conditions by a computer-based SCADA system. The SCADA system consists of a PC-based central computer system located at the City's Wastewater Plant #2 that communicates with the remote telemetry unit located in the control panel of the lift station. The SCADA system gathers information, such as a high wet well level or failed pump runs and relays this information back to main SCADA server alerting wastewater personnel that a problem has occurred.

4) Lift #13, #14 and #22 floors refinished: New composite type flooring was added to these lift stations to extend the life of the floors and prevent further damage from moving equipment and regular foot traffic.



5) Lift Stations #16, #19, #20 and #23 New Light Emitting Diode (LED) Lighting Installed: LED lighting technology has proven itself to be a smart long term investment. LEDs use significantly less kilowatts than other types of bulbs and their lifespan is much longer. This helps to contribute to the Wastewater Division's continuous effort to reduce the carbon foot print and save on electrical costs.



6) Veteran Acres Storm Sewer Station Improvement: Wastewater staff continued to experience pump plugging issues at this facility due to excessive debris from the pond surface. To correct this issue, the level of the pond was lowered in order for permanent baffle repairs to be installed. Since the upgrade, there have been no plugging issues and the station has been operating efficiently.

7) Lift Station Electrical Inspections: In 2014 and 2015, Newcastle Electric was contracted to complete a full condition assessment of all electrical components of each lift station facility. At the conclusion of these physical inspections, a full electrical condition summary assessment report was generated. Staff has reviewed the issues noted at each station and are prioritizing the repairs based on critical need. These repairs are being completed in stages as funding allows.

Water & Sewer Division

The Water and Sewer Division provides an invaluable product and service to the residents and businesses of Crystal Lake. The City's water is a resource that can be consumed and used with pride. Throughout Crystal Lake, eleven wells serve the City's five water treatment plants. The treated water is then pumped into the water distribution system which includes four elevated storage towers. The water level in the elevated towers rises and falls depending on the water system demand. Similar to other McHenry County communities, Crystal Lake pumps water from the ground to serve its users. The City of Crystal Lake treats all water that is pumped into the distribution system to ensure the highest quality potable water is available to our residents.

In addition, the Water and Sewer Division maintains the City's sanitary and storm sewer infrastructure. It is the responsibility of this Division to regulate the inflow and infiltration of ground water and storm water into the sanitary sewer throughout the City, and also to perform JULIE locates for City residents and businesses.

Water Production

Water production is an essential public service that has major implications on public health and quality of life. Crystal Lake, unlike many Chicagoland municipalities, pumps its water from deep and shallow wells, while other communities are able to pump their water directly from Lake Michigan. The City's water comes from aquifers that range from 200 to 1,300 feet below the surface. The water is then treated at one of the City's five water treatment plants before it is pumped to a water tower or holding reservoir. From this point, the gravity from the elevated tower levels helps provide a regulated pressure throughout the City. The Water & Sewer Division takes great pride in producing quality water for City residents.

Water Table 1 – Production (gallons)

	2015	2014	2013	2012	2011
January	118,658,000	117,095,000	118,659,000	116,530,000	121,765,000
February	105,598,000	105,512,000	103,017,000	110,825,000	107,060,000
March	118,734,000	117,441,000	114,613,000	118,937,000	113,938,000
April	117,693,000	118,447,000	114,619,000	128,337,000	113,099,000
May	126,973,000	128,349,000	129,834,000	148,442,000	123,684,000
June	127,488,000	127,260,000	129,625,000	176,414,000	129,147,000
July	133,051,000	133,091,000	146,117,000	180,969,000	164,302,000
August	138,461,000	132,304,000	147,389,000	151,691,000	134,160,000
September	115,229,000	117,723,000	127,308,000	134,531,000	130,352,000
October	111,161,000	113,354,000	117,249,000	118,330,000	120,226,000
November	105,803,000	109,606,000	108,115,000	108,336,000	108,944,000
December	109,067,000	114,100,000	117,506,000	114,221,000	115,238,000
TOTAL	1,427,916,000	1,434,282,000	1,474,051,000	1,607,563,000	1,481,915,000

Water Storage Tanks

The City of Crystal Lake’s water system includes four elevated water storage tanks and four ground water storage tanks. Seven of these water tanks are constructed of steel and one of concrete. Six of the seven steel water tanks have been recently rehabilitated and repainted. The last steel tank has not been reconditioned, however due to age and condition, the Poplar Street Water Tower is scheduled for rehabilitation work in the fall of 2016.

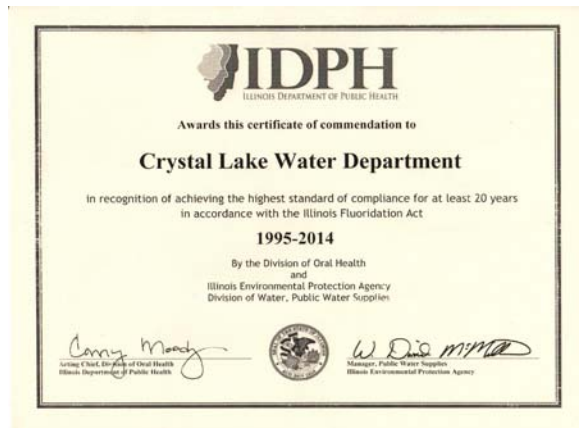


Backup Power

New generators were recently installed and placed in service at the City’s Water Treatment Plant #3 and #5. Currently, three of the five water treatment plants have backup generator power to provide reliable water services to the City’s businesses and residents.

20th Consecutive Fluoridation Award

In 2015, the Illinois Department of Public Health awarded the City of Crystal Lake Water Division with the prestigious Fluoridation Award for maintaining perfect compliance with the State of Illinois Fluoridation Law for 12 consecutive months. This marks the 20th consecutive year that the Division has received this award. Fluoridation law requires municipal water departments to maintain 0.7 - 1.2 milligrams of fluoride per liter of water in the water distribution system. Fluoride helps to strengthen teeth.



Water Distribution System

The City’s water distribution system consists of 230 miles of water mains, 2,850 main line valves, and 3,093 fire hydrants which the Water & Sewer Division maintains and repairs. The underground water mains range from 16” diameter which are newer, large transmission mains to 4” diameter which are older mains that were installed in the 1960s or prior. These

underground water mains transmit potable water from the City's water treatment plants to all of the fire hydrants, residential homes, and businesses located throughout the City.

Annual Hydrant Flushing Program



Fire hydrant flushing cleans out the City's water distribution system and allows for an inspection of City hydrants. Over the course of the year, when hydrants are not in use, the water that services these hydrants is allowed to sit and accumulate debris. The hydrant flushing allows such debris to be flushed out and the hydrant is inspected to ensure that, when called upon, it is in proper working condition.

In the City's newsletter each year, residents are notified that, during flushing, water may become temporarily discolored due to material being removed from water mains. The water is safe to drink, but may stain clothes that are washed during the flushing. Residents are advised to limit laundry cleaning during this time, but if this is not possible, the City offers Rover, a chemical that can be used as a cleanser in laundry to remove iron stains, free of charge.

Water Main Replacement & Extension

In 2015, the Water Division worked in conjunction with the Engineering Division to replace and improve water mains at two locations in the City. The City completed the third and final phase of the Country Club area water main project, which consisted of replacing all water mains from Lakeside Ave to Meridian Street between Country Club Road and Broadway Ave. The second improvement location was along Route 14 from Crystal Lake Ave to Route 176 and 100' of water main on Route 176.

The Water Division works with the Engineering Division on planning water main replacements, which are based on water main conditions and upcoming roadwork. Since the water mains run under the road, it is practical to replace this infrastructure when the roads are under the reconstruction process, rather than replacing the road and waiting a year to replace the water main, which would require the road to be resurfaced again.

This accounted for a substantial portion of the Water Division's capital improvement budget in 2015. In the future, the Water Division will continue to plan water main replacements in conjunction with road projects to save the City the redundancy of road work costs. It is vital that the City continue to replace its water infrastructure to ensure the reliability and quality of the product that the Division is able to provide to the residents of Crystal Lake.

Water Main Break Repairs

The City of Crystal Lake Water and Sewer Division is responsible for the maintenance and repair of the water mains throughout the City. In areas of aged infrastructure, this can become a recurring task. When a water main break is detected, a Water Division crew excavates the dirt from around the area. The water main must be unearthed completely around the location of the break so that the crews can either replace a segment of water main entirely, or put a sleeve on the affected area to stop the leak. Once the break is repaired, the dirt is replaced and a precautionary boil order is issued for the surrounding structures that are directly connected to that water main. This is to ensure that no harmful bacteria or pathogens were allowed into the pipes during the break. In 2015, the Water Division repaired 19 water main breaks and 10 service leaks.



Water Conservation Program

The Water Conservation Program focuses on conserving water by reducing use during peak demands. Due to increasing pressure on the area's ground water supplies, especially in Grafton and Algonquin Townships, it is very important for the City to establish a water conservation plan. To help reduce the City's peak water system demands, the City Council has approved, and the Public Works Department has implemented, a water conservation plan. This plan is part of a long-term effort to promote conservation in order to preserve this precious resource.

The City has implemented a color-coded water regulation program, which is used by many of the surrounding communities. The coding works as follows:

Green Condition – Lawn and landscape watering is permitted between the hours of 5:00 - 8:00 a.m. and 6:00 - 9:00 p.m. There are NO restrictions for other outdoor use of water.

Yellow Condition – Lawn and landscape watering is permitted on odd/even days between the hours of 5:00 - 8:00 a.m. and 6:00 - 9:00 p.m. Property addresses ending in odd numbers shall be permitted to use water on odd numbered calendar days and even numbered addresses on even numbered days.

Red Condition – Outdoor use of water from a connection to the City's public water supply is prohibited.

Residents are notified of the conditions through signs that are placed on the arterial streets throughout the City. In addition, information can be found on the Public Works' webpage.

GPS Locating Water Main Valves for GIS Database

Geographic Information Systems (GIS) are becoming an increasingly useful tool for local governments. The Water & Sewer Division has located all of the City's water main valves utilizing Global Positioning Satellite (GPS) to map on the City's GIS database. This will allow the Division to have the water main valves mapped with incredible accuracy. The GIS system can be used by the Division to record when a particular valve was installed, last serviced, who serviced it, and what exactly was done to it. Also, if the valve is paved over or covered with debris, the Water Division could utilize a GPS device to find its exact location in the field. Having each of these valves identified on a map is useful because it allows the Division to locate them for maintenance and in emergency situations.

Water Meter Reading

The Water & Sewer Division completed a three year meter equipment reading consolidation program. Over the past three years, the Division converted more than 1,500 Sensus meter reading devices at each consumer's location to the City's predominant ITRON meter reading system. This program consolidated the need of two water meter reading systems which required two vehicles and equipment to collect monthly water meter readings into one system. This is now a much more cost effective way to read the City's 13,740 meters each month.

Sewer Collection Systems

The Water & Sewer Division is responsible for the maintenance and repairs of the storm sewer system and sanitary sewer system. Storm sewers collect the runoff of rain water and excess ground water and disposes of it in large reservoirs or lakes. The sanitary sewers carry the wastewater from homes and businesses to one of the City's wastewater treatment plants where it is treated and reintroduced into the environment. The sewer collection system includes 175 miles of sanitary sewer mains and 60 miles of storm sewer and related sewer inlets and manholes that are maintained and repaired by the Water & Sewer Division.

The method that the City utilizes to transport wastewater to the treatment facilities involves a gravity based system. In these sewer systems, the pipes run downhill, allowing the water to flow down using the force of gravity. Periodically throughout the system, there are lift stations that pump the water up a pipe to a higher elevation. From that point, the waste continues its journey downhill until it reaches another lift station or the treatment plant.

To prevent sewer backups and storm and ground water from penetrating the sanitary sewer, the Water & Sewer Division constantly maintains and monitors the sewer system utilizing televising technology. This allows City staff to see blockages or leaks in the sewer pipes. When a blockage or area of penetration is detected, the Division acts to clear the block or stop that leak to alleviate future problems.

Capacity and Reliability of Sanitary Sewer

The Water & Sewer Division has initiated an annual lining and grouting program to reduce inflow and infiltration and improve reliability to the City's sanitary system. When ground water is able to penetrate the sanitary sewer system, it is routed directly to the City's wastewater

treatment plants. During times of heavy rainfall or profound saturation, this influx of water into the sewer lines puts an incredible burden on the treatment facilities. By relining or grouting segments of the sanitary sewer, the Water & Sewer Division is able to reduce the inflow and infiltration of such water, and enable the wastewater treatment plants to effectively treat the City's effluent.

Municipal Separate Storm Sewer System (MS4) Program

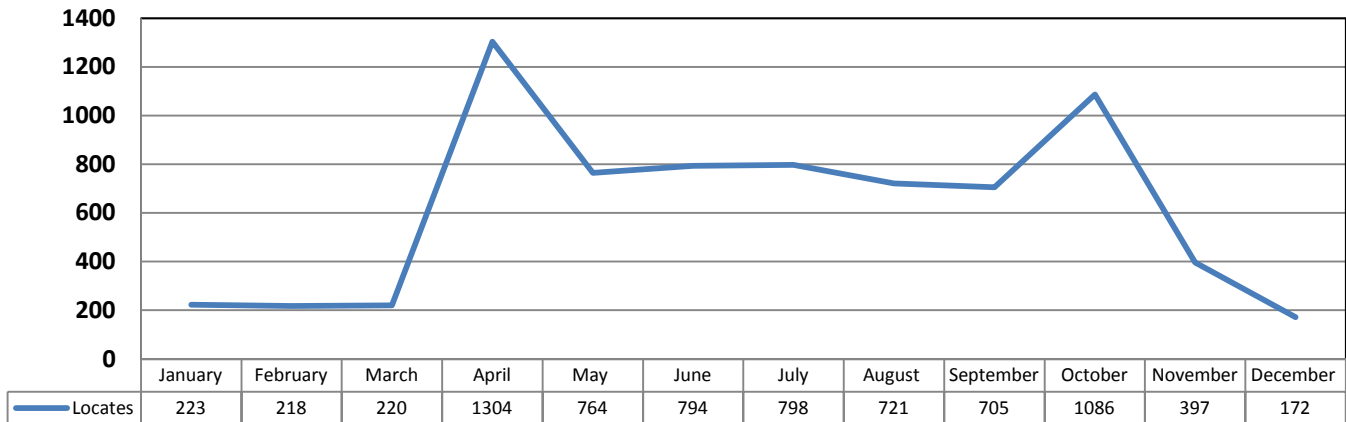
The Municipal Separate Storm Sewer System (MS4) Program is an Illinois Environmental Protection Agency (IEPA) initiative to prevent pollution and contaminants from entering into natural waterways through municipal storm water collection systems. This program calls for oversight of construction sites, water runoff areas and storm sewer systems.

It is the goal of the City of Crystal Lake Water & Sewer Division to aggressively inspect, maintain and upgrade the storm sewer collection system. This goal is accomplished through a multi-year cleaning program of the system and upgrading and repairing the system structures to collect and hold debris. As part of the process, the Division monitors the storm water sewer discharges that flow into natural waterways. In addition to monitoring and maintaining the system, informing and involving the public is a primary objective of this program to reduce the discharge of pollutants. The Wastewater Treatment Division's Pretreatment Inspector has worked with private building owners that contain illicit discharges. These individuals are informed of the sewer use violations and are supplied with information necessary to correctly dispose of such materials.

JULIE Locates

Performing JULIE locates is an essential customer service function of the Water & Sewer Division. When area residents or service providers dig in Crystal Lake, they are required to call JULIE. The JULIE locate system then contacts the Water & Sewer Division to execute these requests. By performing these locates, the Division is performing a public safety service. It is vital that the Water & Sewer Division respond to locate requests within 48 hours (2 hours for emergency requests) to ensure that City utilities have been identified prior to every excavation. In many instances, the Water & Sewer Division acts as the customer service agents of the Department, because they have the face-to-face interaction with residents. This is why prompt responses to calls, courteous customer service, and accurate locates are demanded at every job site. As the following chart illustrates, the Division handles many locates:

2015 JULIE Locates per Month



The trend for the City's JULIE locate services are dependent on construction activity throughout the year. In the spring months, there is typically a great demand as the weather becomes tolerable and construction projects get underway. That demand is high throughout the summer months and lower during winter months as construction projects cease for the season. However, whenever requests are made, the Water & Sewer Division is available to fulfill the legal requirements and the expectations of its businesses and residents.

Cleaning and Televising Sewer System

The Water & Sewer Division has an annual cleaning and televising program for the sanitary and storm sewer systems. Televising is a process in which the Division sends closed-circuit television cameras into the sewer system to examine the pipes. This is how the Division can tell where there is a crack or break in the pipes, where ground water or storm water is infiltrating the sanitary sewer, where tree roots have broken through, or where the pipe has collapsed. This is a vital process to maintain the City's sewer infrastructure. There are three main situations that Water & Sewer Division crews are looking for in the televising process.



1. When roots penetrate the sewer pipes, normally at joints in the pipes, they can cause blockages of the water flow, which backs up the water and causes major problems up the line. To curtail this, the Water & Sewer Division has a root cutting system that runs into the sewer line to trim any root blockage that may be accruing in the line.

2. Inflow and infiltration of ground water and storm water can be detrimental to a sanitary sewer system,



but even more so to the Wastewater Treatment Plants (WWTP) where these lines run. WWTPs have a peak capacity that they can handle on a daily basis. During heavy rain events, when water is able to seep into the sanitary sewer lines, it can overwhelm the WWTP and cause it to produce an overall product that does not meet the normal treatment standards. This problem can be corrected by utilizing either a grouting or lining rehabilitation process.



3. Televising the sewer infrastructure also allows the Water & Sewer Division to detect where the lines have failed or collapsed. In these situations, the camera is not able to pass through the pipe any further. This allows the Division to know where the problem is occurring and repair that segment of pipe. In these instances, the Division must excavate the pipe and replace the segment or connection point that has collapsed.

Fleet and Facilities Division

The Fleet & Facility Services Division provides an important internal service to the City organization. This Division is responsible for the maintenance and repairs of the City's 350 pieces of equipment, including roughly 155 pieces of rolling stock, in addition to the upkeep of the Municipal Complex. Consisting of seven staff, the Fleet & Facility Services personnel are constantly busy responding to facility maintenance requests and servicing the City's fleet. This increased level of service has greatly benefited the Division as well as the organization.

Facility Services

Facility Services perform vital tasks to the maintenance and repair of the Municipal Complex. Staff is responsible for the maintenance and repair of the building, handling contracts of outside vendors for repairs and maintenance services, and responding to the service requests of City employees. Considering the size of the complex, and the intricacies of the mechanical and computerized components in the building, this can be a very demanding job. This unit consists of primarily one employee and various contractors. A recent internal survey of City Staff indicated great satisfaction.

Vehicles & Equipment Specification and Replacements

The Fleet & Facility Services Division also assists other City departments to determine the necessary specifications for replacement vehicle and equipment purchases. Fleet Services researches the available equipment and helps each department match what is available to their need. By being involved early in the selection process, the Fleet Services is able to monitor the equipment coming into the organization, help other departments prepare their budgets for such purchases, and ensure that the right machine is purchased. The following are examples of items purchased in 2015:

- In February, the Division handled delivery of two Ford Transit Connect vans. These four cylinder vans have replaced less fuel efficient outgoing vehicles in Wastewater and Water/Sewer Divisions. The Wastewater van was equipped with tool and equipment storage racks while the Water & Sewer unit was equipped with a water meter reading device. Both were equipped with safety lighting.
- In April, the Division handled delivery of a new Street Division 2015 Ford F-550 mini dump truck with a front mount plow built by Monroe Truck Equipment in Monroe, Wisconsin.
- During the fall, the Division received delivery of two 2016 Ford Police Interceptor SUVs to replace two outgoing Fire Department Bureau Chief Vehicles. The Division worked with the Fire Rescue Department and Ultrastrobe Communications Inc., to get the vehicles outfitted with emergency lights and command hardware. These units are equipped with smaller V6 engines and all wheel drive. This provides better fuel economy while also providing better traction during winter weather events.

- The Division also handled delivery of five replacement vehicles for the Police Department. This included Ford Police Interceptors, one SUV and four sedans, all powered by a fuel efficient V6 engines and all wheel drive trains. The outgoing units were Ford Crown Victorias. The Division worked with the Police Department and Ultrastrobe Communication Inc. to get these units setup with lighting and communications packages.
- This year, in the absence of a state bid purchase opportunity for the acquisition of two dump trucks, the Division had sought input from the Streets Division and created its own bid specifications for two heavy duty dump trucks. The dump trucks have been ordered from Rush Trucks in Huntley, Illinois, and will be up fitted with all equipment by Bonnell Industries in Dixon, Illinois. The trucks are expected to be delivered by March 31, 2016.
- The Division procured and setup a new 2015 John Deere 1575 tractor that was equipped with a drop spreader and safety lighting for sidewalk salting operations. A drop spreader was chosen over a broadcast unit to reduce over-application of salt, saving material and reducing damage to vegetation. A stainless steel blade was also used to reduce the iron staining of concrete sidewalks.

Snow Plow Rebuilds & Inspections

During the winter weather off season, the Division evaluated all Schmitt-Wausau sectional plows for restoration, replacing worn out parts where necessary, while adding components that will reduce normal wear and tear. The Division is changing to a simpler, more cost effective single moldboard plow design on all new fleet trucks. Each year the Division evaluates vehicles with the goal of enabling the city's snow fighting equipment ready and available by November 15th.

Scrap Metal Recycling

The Division continues to manage the collection of all scrap metals and works with a recycler to ensure the City's recycling all materials as necessary and recovering funds for such scrap materials. To date, this program has recovered over \$40,000.

Special Projects

In 2015, the Fleet and Facility Division handled the following projects:

- Several office spaces were redesigned and restored. This included painting, office furniture procurement and setup. These spaces included the Water & Sewer Superintendent and Supervisors' offices, the Administrative Assistant's office in the Water Sewer area and the Streets Division Supervisor's office, all within the Public Works' garage.

- The Division installed computer and monitor displays in various conference rooms to allow more visual displays during meetings.
- The Division worked with Obenauf Auction Services throughout the summer to create an online public auction that sold 163 miscellaneous items ranging from vehicles to office equipment designated as surplus. The auction ended with the most items being sold to date. Items not sold and having no value were recycled or scrapped.
- All water fountain stations were retrofitted to include a bottle refilling station. This will help reduce the amount of plastics going into landfills.
- A contractor was hired through a public bidding process to remove and replace one of two failing trench drains within the Public Works' garage. The Division oversaw the project which included cutting concrete and removal of the old fiberglass trench drain. A new, more robust cast iron drain and grate system was installed as replacements. Concrete was poured and finished by the contractor, restoring an effective drain system within the garage.
- The Division hired RTM, an engineering firm, to address our boiler room make up air system to include a pre-heating measure to eliminate equipment lockout due to cold air entering the space. The firm also addressed a negative pressure issue in the present building boiler room. Funding is requested for the 2016-2017 Fiscal Year to hire a contractor to install the heating systems designed by the engineering firm.



The 100 Best Fleets in North America

The Fleet and Facility Services Division was ranked 59th as “The 100 Best Fleets in North America” in 2015 as determined by The 100 Best Fleets organization. The Division was evaluated on various criteria against competitors across North America. Such criteria included:

- Accountability
- Use of technology
- Collaboration
- Creativity
- Celebration
- Evidence of high trust culture
- Performance recognition
- Doing it right the first time
- Quick efficient turnaround
- Competitive pricing
- Staff development
- Resource Stewardship



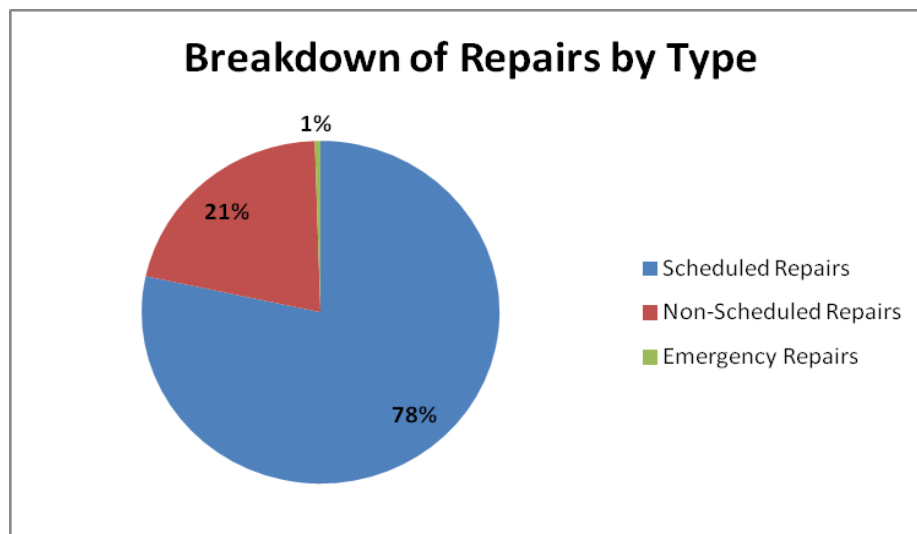
Emergency Vehicle Technician Certification

During the past several years, the Fleet & Facility Services staff have obtained numerous Emergency Vehicle Technician (EVT) Certifications. Currently the Division has three Master Ambulance and two Master Fire Apparatus certified staff members. This qualifies them to work on the fire and ambulance apparatus, which keeps repair and maintenance costs for these vehicles in-house. By attending various training opportunities and obtaining these certifications the Division saves City funds since the vehicles do not have to be serviced by outside vendors. In addition, vehicles are serviced quicker in-house which is very important for emergency response vehicles.



Statistics

The fleet side of the Division had generated an estimated 1,970 work orders throughout the year. The following charts illustrate fleet repair characteristics:



Inspections & Compliance

The Division coordinated the following activities:

- Inspection, repairs and certifications of all city owned backflow pressure devices.
- The Critical Environment Gas detection systems were tested and calibrated twice; once in April and December. These systems control the quality of air and protect against rising levels of carbon monoxide and nitrogen dioxide within the public works garage, police department sally port and the fire station apparatus bay.

- All required fire alarm and fire suppression system inspections throughout the year with Fox Valley Fire.
- All elevator quarterly inspections were coordinated by the Division and performed by Otis Elevator.
- Worked with a contractor to perform annual inspections of all fire extinguishers and coordinated with the Fire Department to offer fire extinguisher training to all Public Works employees.
- All city owned generators have received monthly, quarterly and annual inspections and maintenance as required. Most repairs are handled in house by the auto technicians, while some repairs are completed with Wastewater staff; a small amount of repairs are outsourced when necessary.
- Semi annual inspections of the roofing systems at City Hall were performed in spring and fall by Northern Illinois Roofing. The complete roof is inspected for condition and repairs are made when necessary.

Streets Division

The Streets Division completes routine and special projects for our community. For example the Division completes projects including creation and installation of all regulatory street signs, snow fighting operations, tree planting, trimming, and EAB removal programs, street sweeping functions, City holiday decorations, and the repair and maintenance of all 175 centerline miles of City streets. As a result this Division is highly visible to the public and interacts with the community on a regular basis.



Maintenance & Beautification of Downtown Business District

Throughout the year the Streets Division maintains the Downtown Business District and Train Depot. Beautification of the Downtown is a high priority for the Streets Division year after year. Services provided by the Division included the hanging, watering, and maintenance of hanging flower baskets, mulching and landscaping flower beds, pressure washing sidewalks, and picking up refuse and litter. Providing these services keeps the area clean and welcoming to residents and visitors all year long.

Street Sweeping

Street sweeping is an important duty of the Streets Division. City crews continually sweep approximately 326 lane miles of streets to remove rocks and debris from the roadway that may cause hazardous conditions to motorists, or potentially block the City's storm sewer drains, thereby rendering the system inoperable. When storm sewers are blocked, water has nowhere to run off causing flooding and other dangerous conditions on the roads. In addition, sweeping the City streets keeps the roads clean, which adds to the charm and character of the community.

Tree Planting Program



Each spring and fall, the Streets Division conducts our semi-annual Tree Planting Program. To determine the need for a new tree, City Arborists keep an inventory of City-owned trees, and routinely survey the City for public properties that are in need of additional foliage. In some instances, these trees act as replacements for diseased trees that have died or trees that have been severely damaged in a storm event. In the fall of 2015, the Streets Division planted 194 trees in the City's parkways.

Tree Trimming Program



Trimming parkway trees is an essential safety function of the Streets Division. In order to give trees the greatest chance of survival, it is the goal of the Streets Division to inspect and prune all City-owned trees on a five-year trim cycle. Proper pruning promotes positive growth and future development of the tree. By adhering to a pruning cycle, the Streets Division will be able to prune the trees in conformance with current ordinances without removing larger limbs. In addition, the pruning cycle allows Streets crews to monitor the

health of the City's tree inventory. Currently, the Streets Division has two ISA certified arborists on staff to ensure that proper care is provided for all of the City's trees.

Emerald Ash Borer

The Emerald Ash Borer (EAB) was first detected in Crystal Lake in late August of 2008. The EAB is a small, metallic green, non-native invasive pest whose larvae feast on the trunks of Ash trees, thereby cutting off their ability to transport nutrients and ultimately causing the tree's decline. The picture to the right depicts a City tree that was infested with EAB. Note the thin nature of the leaves and branches compared to other trees in the yard.



The removal of EAB infested trees has continued to be a high priority for the Street Department as work continues on a routine basis utilizing contractors as well as in-house crews. In 2012, the department started the removal process of approximately 6,000 City owned Ash trees. As of December 31, 2015, there are approximately 384 Ash trees remaining for removal. In addition, as of late fall 2015, a total of 1524 replacement tree plantings were planted. Approximately 775 tree plantings are scheduled for the spring and fall of 2016. Most of the infested trees that were removed are planned for replacement. Exceptions include any tree replacement that would violate the City's Municipal Code related to spacing limitations, traffic/vision obstructions or conflicts with various utilities. The Division anticipates that most tree replacements will be planted within two to three years of removal.

Gypsy Moth Program

Annually, Streets Division personnel coordinate with McHenry County staff to plot areas within the City to spray for gypsy moths. The gypsy moth is a non-native, leaf-eating insect that feasts on trees and shrubs. In large populations, they are capable of stripping plants bare, leaving

them vulnerable to secondary insect and disease attacks. To reduce the devastation caused by this insect, the Streets Division, along with many other McHenry County local governments, sprays sites by helicopter with an application of Bt.k., a naturally occurring bacteria used by gardeners as an environmentally friendly alternative to chemical pesticides. The City's arborists examine groves of trees within the City each winter to identify gypsy moth eggs. These sites are then relayed to the county to coordinate with the helicopter pilot who is responsible for the spraying.

In 2015, the devastation caused by the gypsy moth has been significantly reduced due to the spraying efforts and dedicated work of the City's arborists.

Streets Signs and Signs Shop

The City of Crystal Lake Public Works sign shop is responsible for the repair and upkeep of the City's 7,405 signs. Types of signs include: regulatory, warning, street name, and ground mounted guide signs. During the past two years, the City has developed and implemented a traffic sign inventory and management system that meets all requirements of the Federal Highway Administration. The new program allows the Division to maintain and keep track of all signs within the City as well as provide a list of all signs not meeting the federal highway requirements for day and nighttime visibility. The new program is also a management system that tracks sign inventory and all signage maintenance activities.



Snow Fighting

As a result of the 36 inches of accumulated snowfall in the winter of 2014/2015, the Streets Division began investigating alternatives to salt as the only snow-fighting tool in their arsenal. This became a strong initiative of the Department as the year progressed. When Crystal Lake was omitted from the state salt bid along with the other local governments of McHenry and Lake Counties, this transition into alternate de-icing and salt conservation tactics became invaluable. While there is no way to fully overcome the budgetary constraints that are

associated with increasing costs of an indispensable commodity, the Department made every effort to conserve its salt resources and to utilize alternative snow-fighting strategies where possible.

Throughout the season, there were 48 snow and/or icing occurrences, which is a decrease from the 85 incidents in the previous year. To ensure the safety of Crystal Lake motorists, and to

cover all of the City's 175 center-line miles of roads, the Department accounted for 5,342 man-hours of work from November 2014 through March 2015.

Due to the constant snow and ice events, the Division received a large quantity of reports from City residents of mailboxes being knocked down. In many cases, the heavy snow loads being pushed from the plow were hitting the mailbox posts causing them to break. It has been City policy to replace mailboxes that are damaged by plowing operations. In total, the Streets Division replaced or repaired 69 mailboxes throughout the City at a cost of \$8,424.

Downtown and Virginia Street Holiday Decorations

The Streets Division installed holiday garland and lighting decorations this year that included over 3,438 feet of garland and 1,000 strands of new LED lighting, totaling over 24,000 feet of lights. The new 72 foot holiday skyline was also strung over Williams Street giving the Downtown the "winter wonderland feeling".

