CITY OF NAPERVILLE WATER UTILITIES

CAPACITY, MANAGEMENT, OPERATIONS AND MAINTENANCE (**CMOM**) PROGRAM

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ACRONYM LIST

CIPP – Cured in Place Pipe
CMMS – Computerized Maintenance Management System
CMOM – Capacity, Management, Operation and Maintenance
C&P – Collection and Pumping
CWA – Clean Water Act
DIP – Ductile Iron Pipe
FOG – Fats, Oils and Grease
GIS – Geographic Information System
H_2S – Hydrogen Sulfide
I&I – Inflow and Infiltration
IEPA- Illinois Environmental Protection Agency
LACP- Lateral Assessment Certification Program
MACP- Manhole Assessment Certification Program
MGD – Million Gallons per Day
NASSCO- National Association Sewer Service Companies
NPDES - National Pollutant Discharge Elimination System
PACP- Pipeline Assessment Certification Program
PMS- Preventive Maintenance Schedule
PVC – Polyvinyl Chloride
RCP – Reinforced Concrete Pipe
RDII- Rainfall Derived Infiltration and Inflow
R&E – Repair and Excavation
ROI- Return on Investment
SCADA - Supervisory Control and Data Acquisition
SSO – Sanitary Sewer Overflow
SUO – Sewer Use Ordinance
USEPA – United States Environmental Protection Agency
VCP – Vitrified Clay Pipe
WO – Work Order

INTRODUCTION AND GOALS

The City of Naperville Department of Public Utilities-Water has developed a Capacity, Management, Operation, and Maintenance (CMOM) program designed to help optimize the performance of the sanitary sewer collection system. In accordance with Illinois Environmental Protection Agency (IEPA) NPDES Permit No. IL0034061, the major objectives of the City of Naperville's CMOM program include:

- Work towards the goal of achieving zero discharges from sanitary sewer overflows or basement back-ups.
- Ensure that if overflows or back-ups do occur, they do not cause or contribute to violations of applicable standards or cause impairment in any adjacent receiving waters.
- Manage, operate, and maintain the sanitary sewer collection system so that the system complies with the Clean Water Act.
- Provide enough capacity for the entire sanitary sewer collection system to convey base and peak flows without sanitary sewer overflows.
- Continue the City of Naperville's successful Inflow and Infiltration program to reduce overflows in the sanitary sewer collection system.
- Provide timely notifications to the public of sanitary sewer overflows as part of the Third-Party Notification Plan.
- Provide the CMOM program to the public for review annually.
- Update the CMOM program on an annual basis. If any major changes are required, the CMOM will be updated as needed.

Sanitary sewer maintenance activities are prioritized using a variety of resources, including televising and inspection reports, CMMS data, RDII reports, flow monitoring and SCADA operational data. Sanitary Sewer Maintenance Goals Include:

- Reduce basement backups with a goal of zero basement backups every year. (not including private wastewater backups*)
- Reduce wet weather storage lagoon(s) overflows with a goal of zero lagoon overflows every year.
- Reduce usage of wet weather storage lagoons. (Lagoon use is tracked in the City's SCADA system).

To achieve the above goals to reduce SSOs and basement backups, sanitary maintenance and inspection goals have been developed. Below is a list of the maintenance and inspection goals.

- Sanitary sewer maintenance goal of cleaning every sewer segment every 5 years. (See Sanitary Sewer Cleaning section of the document for the entire sanitary sewer cleaning procedure).
- Sanitary sewer CCTV Inspection goal of televising 75,000 linear feet of sewer for calendar year 2020.
- Maintain a hydraulic model to monitor the sanitary collection system for capacity issues. This will assist with the goal of zero basement back-ups and SSOs.

All Sanitary Sewer Maintenance goals as well as all work activities for the collection system are tracked in Cityworks, the City of Naperville's CMMS (Computerized Maintenance Management System). Cityworks is an enterprise asset management system that in conjunction with the City's extensive GIS network, enables us to track preventative, reactive, or planned work activities on our assets along with associated costs including labor, equipment, and materials. Data from Cityworks is reviewed daily and with the use of Microsoft Power BI data visualization software, the data is transformed into easy to read visualizations for that provide real-time statuses of the programs and goals. See *Appendix GG for examples of the visualizations.*

*It is important to note that private basement back-ups and lateral line issues are the sole responsibility of the property owner. The City of Naperville will assist all property owners with private back-up problems as part of City of Naperville Ordinance 92-234, 12-15-1992.

GENERAL INFORMATION FOR WATER & WASTEWATER

WATER:

Supply Source: Dupage Water Commision - Lake Michigan Water Supply System

System Capacity:

Lake Michigan Water Supply	35.883 MGD
Emergency Standby Wells	11.830 MGD
Total	47.713 MGD
Reservoirs & Storage Tanks	15
Water Storage Volume	43.90 million gallons
Average Daily Water Usage (Calendar 2018)	14.650 million gallons
Peak Day Usage (July 13, 2018)	26.139 million gallons
Peak Month (July, 2018)	639.447 million gallons
Historical Peak Day Usage (July, 2005)	36.837 million gallons
Historical Peak Month Usage (July, 2005)	895.198 million gallons
Total Water Usage (Calendar 2018)	5,347.348 million gallons
Water Mains (December, 2018)	735.57 miles
Valves (December, 2018)	18,809
Fire Hydrants (December, 2018)	9,480
Customers - Total (January, 2019)	43,916
Customers - Residential (January, 2019)	40,413
Rates - Residential (January 1, 2019)	Customer Charge: $6.84 per month
	Volume Charge: $5.55 per 100 cubic feet

Water Utility Population Served:

Inside City Limits	145,855
Outside City Limits	5,030
Total	150,885

WASTEWATER:

Treatment Facility	Springbrook Water Reclamation Center
Capacity - Dry Weather Design (MGD)	26.25 million gallons/day
Capacity - Wet Weather Design (MGD)	55.13 million gallons/day
Average Daily Wastewater Flow (Calendar 2018)	21.32 million gallons/day
Average 3 Low-Flow Months (Calendar 2018)	17.16 million gallons/day
Customers - Total (January, 2019)	43,221
Rates - Residential (January 1, 2019)	Customer Charge: $10.02 per month
	Volume Charge: $2.46 per 100 cubic feet

Wastewater Utility Population Served:

Naperville	149,294
Warrenville (2017 Est.)	13,269
Total	162,563

SANITARY SEWER OVERVIEW

The City of Naperville's Wastewater Collection system includes:

- 2,692,818 linear feet (510 miles) of gravity sewer and interceptors
- 12,059 manholes
- 22 lift/pump stations
- 43,349 linear feet (8.21 miles) of force mains
- 43,221 customers

The diameter of sanitary sewer mains ranges in sizes from 6-inches to 60-inches, depending upon the type and location of the pipe. Sewer piping construction materials consist of vitrified clay pipe (VCP), polyvinyl chloride (PVC) pipe, ductile iron pipe (DIP), reinforced concrete pipe (RCP), asbestos cement pipe and cast-iron pipe.

The system includes two (2) permitted interceptors that convey sewage to the Springbrook Water Reclamation Center (SWRC). Each interceptor has specified tributary areas that include smaller trunk sewers, sewer main lines and pump stations/forcemains. Both interceptors are constructed of reinforced concrete pipe (RCP).

The age, construction system/material, elevations and other key information is recorded in the City's geographic information system (GIS). Design plans are stored in the City's OnBase records management system and all maintenance history of each section of sewer, forcemain, interceptor, manhole and lift station are recorded in the City's CMMS.

Below is the current pipe material breakdown of the Collection System:

City of Naperville
Water Utilities
Pipe Material 2019

PIPE MATERIAL	GRAVITY MAINS	FORCEMAINS
Asbestos Cement Pipe	0.5%	0%
Cast Iron	0.5%	0%
Non-Reinforced Concrete Pipe	0.5%	0%
Ductile Iron	3.5%	77.5%
High Density Polyethylene (HDPE)	0.5%	1.5%
Polyvinyl Chloride (PVC)	40%	8.5%
Reinforced Concrete Pipe (RCP)	3%	0%
Steel Pipe	0%	10%

PIPE MATERIAL	GRAVITY MAINS	FORCEMAINS
Truss Plastic	1.5%	0%
Vitrified Clay Pipe (VCP)	28.5%	0%
Cured-In-Place Pipe (CIPP)	21.5%	2.5%
Total	100.0%	100%

Refer to the following appendices for additional Collection System information:

Appendix A - Service Area Map (Naperville/Warrenville)

Appendix B - Sewer Basin with Pipe Sizes

Appendix C- City Wide Sanitary Sewer Mains

Appendix D - Divertible Location Maps

Appendix E - Gravity Main Age

Appendix F - Siphon Location Map

SANITARY SEWER COLLECTION SYSTEM FUNDING & BUDGET

The City of Naperville's sanitary sewer system is funded by a utility user fee which is based on potable water consumption. The utility user fee provides a dedicated source of funds for the operation, maintenance, and capital improvements of the City's sanitary sewer collection system.

In areas with no potable water consumption, wastewater customers are charged a flat rate of $43.28 (2019). See *Appendix G – Monthly Utility Rates* for a detailed list of monthly water and wastewater charges.

The 2020 annual budget for Wastewater is about $8.6 million and broken down into the three main categories of:

- Operations and Maintenance- $ 2,785,979
- Collection System Capital Improvements- $ 5,125,000
- Lift Station Capital Improvements- $ 640,000

For more detailed information on the annual budget, please refer to:

Appendix H – 2020 Capital Improvement Budget

Appendix I - 2020 Operations & Maintenance Budget

CUSTOMER SERVICE

The City of Naperville Water Utilities prides itself on outstanding customer service. Customers or residents that experience any type of wastewater issue are encouraged to call the Water Department at (630) 420-6137 before calling a plumber. City staff are available to assist customers 24 hours a day, 7 days a week, 365 days a year. Below are the steps taken to assist the customer when they notify the City of an issue:

1. A Utility Technician is dispatched and inspects the City's sanitary sewer mains to determine if the City's mains are the cause of the issue.
2. If the City's mains are clear, the Utility Technician will measure the distance of the City main to the resident's house to provide a rough distance of the service lateral for a plumber to reference.
3. The Utility Technician discusses the findings with the customer and provides a copy of the City's "Wastewater Customer Service Handout."
4. The Utility Technician educates the customer on the handout and what to look for before calling a plumber.
5. The customer is encouraged to call the City if they have any concerns or questions.

Appendix J – Customer Service Handout is a copy of the City of Naperville's customer service handout which includes information on the ordinance, registration form, survey and frequently asked questions. Customers are also given a link to the Water Department's "Customer Service Survey Form". The Water Department's annual goal on the Customer Service Survey is 4.85 out of 5.

EMERGENCY OPERATING PLAN (EOP)

Effective emergency management planning requires considerable coordination and forethought. There are various types of emergencies and/or disasters that can negatively impact the operation of the sanitary sewer collection system.

When a dry weather sanitary sewer back-up is confirmed by a Utility Technician, sewer cleaning equipment is immediately mobilized and used to remove the blockage from the sewer. The footage of the blockage is noted and given to the TV inspection crew. All dry weather main line blockages are televised to confirm full removal of the blockage, what the blockage was caused by and if there is a structural issue with the main.

If blockage removal is unsuccessful or there is a structure issue with the sewer main, the repair is given to the City's Repair and Excavation (R&E) crew. After emergency underground utility locates are completed, R&E makes all necessary repairs. After the repair has been completed, the TV inspection crew will televise the repaired main for our records. Once all repair work has been completed, City contractors are scheduled to restore any asphalt, concrete, and/or landscape areas that require restoration.

When wet weather sanitary sewer overflows or basement back-ups occur, the following steps are taken:

1. A Utility Technician is dispatched to the affected area and inspects the City's manholes to determine if the City's mains are surcharged.
2. If the manholes are surcharged, the Utility Technician(s) will notify the affected customers of the issue and provide plugs to help avert the back-up.
3. A work order is created in the CMMS to document the back-up and for follow-up with the resident(s).
4. Affected residents are provided information regarding the City's "Back-Flow Prevention Reimbursement Program." *(Appendix K – Backflow Prevention Reimbursement Program)*
5. After the wet weather event, the IEPA is notified of all back-ups and the wet weather event is evaluated by the City's flow analysis contactor.

The City of Naperville Water Department's full Emergency Operating Plan is also part of this CMOM. The EOP covers all sections of the Water Department including Water Supply, Water Distribution, Wastewater Collections & Pumping, and the Springbrook Water Reclamation Center. *See Appendix L – Emergency Operation Plan (EOP)*

OVERFLOW RESPONSE PLANS

The City of Naperville is very proactive at working to prevent any release of sanitary sewage into the environment. However, it is not always possible to prevent these releases. If a sanitary sewer overflow does occur, the City of Naperville follows the "Overflow Response Plan for reporting Sanitary Sewer Overflows" as detailed in *Appendix M - Overflow Response Plan.*

The detailed Overflow Response Plan includes:

- When and who to contact at the IEPA
- When to submit the "Sanitary Sewer Overflow or Bypass Notification Summary Report"
- Instructions on how to take and document water samples of overflow(s) at the DuPage River
- Springbrook Laboratory contact list and order to contact
- Bypass estimate of flow calculations
- Assisting property owners
- How a property owner can make a claim

REPORTING AND MONITORING REQUIREMENT

IEPA Reporting

The City of Naperville follows the IEPA protocol on Sanitary Sewer Overflow (SSO) reporting. All SSOs are reported in a timely manner. A full event summary report including follow-up action plans are submitted within the required ten-day time frame. Included in the full report, if applicable, are the test results of the water samples taken of the lagoon(s) overflow and samples of the DuPage River just upstream of the lagoon(s) overflow.

SSO Monitoring and Detection

The City of Naperville has an SSO (Sanitary Sewer Overflow) monitoring program that monitors eleven areas for possible SSOs. These monitors have texting and email alarming capabilities which allows City staff to respond quickly to potential SSOs. All the SSO monitors are maintained by ADS and data is reviewed by ADS for the annual RDII. See *Appendix Q – SSO Monitoring Map* for locations of these monitors.

Program for tracking and reporting basement back-ups, including the general public complaints

The goal of tracking basement back-up is to establish trending and mapping of problem areas so these areas can be addressed to achieve the goals of this CMOM. Currently, the City has no known areas of basements back-ups do to the results of our current sanitary sewer maintenance and I&I reduction programs. All basement back-ups, SSO or any customer service calls are tracked in the City's CMMS (Cityworks). These items can be queried and tracked in the system for events going back to 2006. See example of CMMS tracking in *Appendix KK- SSO Work Order Tracking*.

FLOW MONITORING AND RAIN GAUGES

The City of Naperville started a comprehensive flow monitoring program in 1998. Currently, there are thirty-eight (38) sanitary sewer flow monitors in the collection system. The City has a contract with ADS Environmental to maintain all open channel flow monitors. ADS Environmental is also contracted to produce an annual Rainfall Derived Inflow and Infiltration (RDII) report as well as two specific rain event RDII reports as needed or requested. All twenty-six (26) permanent open channel flow monitors have alarming which provide immediate notification to staff regarding the status of the system at those sites. All alarms are sent via text and email. See *Appendix N - Permanent Flow Monitoring Map* for locations of all the permanent flow monitors.

In addition to the permanent flow monitors, the City also has seven (7) temporary flow monitors in the collection system. These monitors are used for small area flow studies and Return on Investment (ROI) data. See *Appendix O – Temporary Flow Monitoring Map* for locations.

Thirteen (13) of the City's wastewater lift stations have magnetic meter flow monitoring equipment. All the data is reported though the SCADA system and monitored daily by City staff to ensure stations are running as designed during dry and wet weather operations. All data is also given to ADS for the annual RDII report. These flow monitors are maintained by City of Naperville staff.

Rain gauges are a critical part of the City of Naperville flow monitoring program. Currently, there are twelve (12) rain gauges in the system, each covering a 2-mile diameter area. These rain gauges cover 99% of the city of Naperville and 100% of the City of Warrenville. Eleven (11) of the rain gauges are maintained by City of Naperville staff and one (1) is maintained by ADS. All rain gauge data is given to ADS for the RDII studies. *Appendix P – Rain Gauge Map* shows the location and coverage of each of the rain gauges.

INFILTRATION AND INFLOW (I&I) PROGRAM

The City of Naperville Water Utilities has a very aggressive and successful I&I program as shown in *Appendix R – Flow Reduction Examples.* The I&I program includes:

- Flow Monitoring
- Small Diameter Sewer CIPP Lining
- Interceptor/Trunk Sewer CIPP Lining
- Main Line and Service Lateral Grouting
- Dye Flooding
- Smoke Testing
- Manhole Inspections
- CCTV Program for Mains and Laterals
- Annual RDII reports from ADS
- Private Property Inspections
- Building Inspections

FLOW REDUCTION AND I&I PROGRAM EFFECTIVENESS

The City of Naperville has a nationally known Infiltration and Inflow (I&I) Reduction Program. The program started in the early nineties and was updated in 2003. The current Infiltration and Inflow Reduction Program is updated annually. In this CMOM program there are several examples of the effectiveness of the I&I reduction program.

Naperville's proactive approach to combating I&I has yielded positive results. Prior to the implementation of an I&I program, the daily flows to Springbrook Wastewater Reclamation (SWRC) plant were 26.75 million gallons per day (MGD). Today, the current flows to Springbrook Wastewater Treatment Plant average 19.75 MGD. Since 1998 the population of Naperville has increased by roughly 30,000 people, or about 20%. Yet when looking at the average amount of water treated at the SWRC flows have decreased by roughly 18% over the same period. *Appendix JJ* shows this trend in a graphical format.

Additional examples of how effective the I&I program is shown through the reduction in customer service calls we receive, reduction in sewer maintenance costs, and the types of maintenance activities staff performs. For example, in 2007 staff responded to 600 sewer related customer service calls. In 2018, responded responded to only 280 calls. Less time spent on responding to customer service calls means staff can spend more time on I&I work which reduces the chance of mainline backups. The I&I program has reduced the linear feet of sewer main that requires root cutting, which has saved $39,000 yearly and reduces chances of injuries by staff. Because of the I&I programs, the pump stations throughout the City operate more efficiently, cost less to operate (more electricity efficient), require less maintenance, and require less by-pass pumping during high-flow events.

WASTEWATER LIFT/PUMP STATIONS/FORCE MAINS

The City of Naperville Water Utilities operates and maintains twenty-two (22) wastewater lift/pump stations and six (6) backflow prevention stations. All stations are monitored twenty-four hours a day, seven days a week by the City's SCADA system. All stations also have alarming capabilities via the SCADA system and texting alarms by Win911 system.

All wastewater lift/pump station have a variety of redundancy capabilities, including:

- Back-up generators
- By-pass pumping connections
- Redundant alarming
- Back-up PLCs
- Back-up level controls
- Spare pumps on hand

Lift stations are checked daily though the SCADA system and inspected monthly. On a semi-annual basis, a more extensive preventative maintenance inspection is performed at all stations. All work is tracked through the CMMS. Examples of the inspections performed, and data collected can be found in *Appendix S – Lift Station Monthly and Semi-Annual Inspections. Appendix GG* is example of lift station Inspection tracking.

Force Mains: All wastewater lift station/pump station force mains are mapped in the City's GIS system. Maintenance and repairs are tracked in the City's CMMS.

SANITARY SEWER CCTV INSPECTIONS

The City of Naperville Water Utilities currently owns and operates one mainline/lateral inspection Closed-Circuit Televising (CCTV) truck. The truck is operated with a two-man crew, which annually inspects 75,000'-90,000' of sanitary sewer per year. The yearly CCTV schedule is updated annually and is adjusted based on many factors including customer service calls sanitary sewer cleaning, CMMS data, flow monitoring data, and RDII reports.

See Appendix T – CCTV Inspection Schedule.

The schedule includes:

- O&M TV Inspections
- CIP TV Inspections
- Customer Service Inspections
- Warranty TV Inspections
- Infiltration and Inflow Inspections
- Miscellaneous Inspections

MANHOLES

The City of Naperville's sanitary sewer collection system has 12,059 public manhole structures. All manholes have been located and are in the City's GIS mapping system. Manholes are visually inspected on a regular basis during sewer cleaning activities. Also, manholes that are in an I&I focus area are inspected during saturated ground conditions. These inspections are done using NASSCO MACP type 1 format *(Appendix U – Manhole Inspections Type 1).* Typically, a total of 1,000 to 3,000 manholes are inspected per year depending upon the sewer cleaning program. Manholes are repaired as necessary to reduce I&I into the sanitary collection system. All O&M repairs are done with City crews while all Capital Improvement repairs are done by contractors.

Examples of repairs include:

- O&M Manhole Repairs
    - Frame and lid replacement
    - Upper structure repairs or replacements
    - Upper Structure Manhole Lining with CIP (Chimney Liner)
    - Chemical grouting
    - Bench and channel repairs
    - Cone and barrel repairs

- Capital Manhole Rehabilitation
    - Manhole Replacement Program
    - Entire Manhole Lining - (Spray-on or CIP)
    - Upper Structure Manhole Lining with CIP.

All manholes running along water ways or retention areas have the lids bolted down to prevent the lids from coming off during high flow events. The City also installs Parson Manhole Inserts within manholes located in low lying areas known for flooding. Inserts are used to prevent inflow from entering the system from the manhole lids. There are currently 4500 manhole inserts in the system. The manhole inserts are maintained on an annual basis.

MONTHLY INSPECTIONS

The City of Naperville Water Department performs monthly site, equipment and safety inspections including:

- Visual inspection of all Wastewater Lift Stations
- Visual inspections of all Back-Flow Prevention Stations
- Visual inspections of all Force Main Air Release Valves
- Full inspections of all emergency pumping and power equipment
- Safety inspections of personal safety equipment and other equipment
- Wastewater hotspots

All monthly inspections are tracked in the City's CMMS system and safety paperwork is sent to the City's Safety Department.

NEW CONSTRUCTION

Currently, the City of Naperville's Transportation, Engineering & Development Business Group (TED) handles all inspections on construction of new sanitary sewer assets. The Water Utilities Civil Environmental Engineering Group (CEEC) assists with reviewing plans and videos of service lines and CCTV videos of completed work.

New construction inspections include:

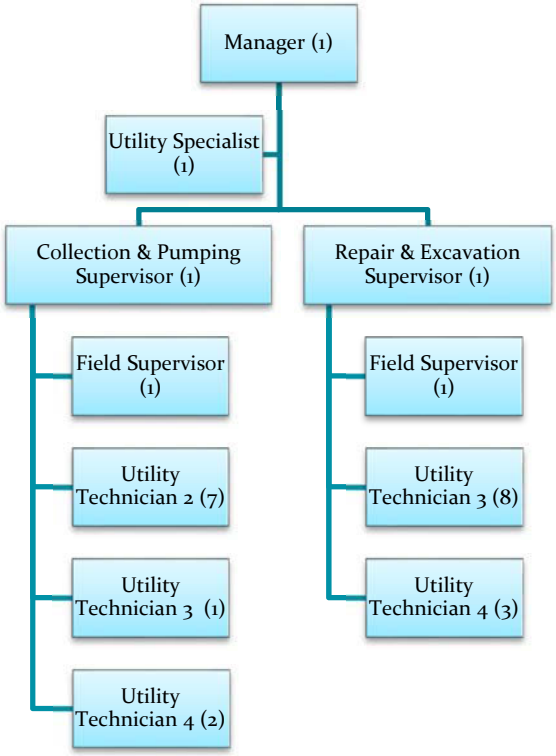
- Water Utilities' Civil Environmental Engineering Group (CEEC), review of site and concept plans
- Manhole vacuum testing
- Sanitary mainline mandrel testing
- Leakage testing
- Air testing

Information on new construction standards and testing can be found in *Appendix V – Naperville Construction Standards* and *Appendix W – Manhole Testing New Construction.*

ORGANIZATIONAL STRUCTURE

The City of Naperville's Water Utilities currently has a total of 84 team members. Of these, 12 team members work in the Wastewater Collection and Pumping section of the Water Distribution and Collection Division. The Collection and Pumping section is responsible for all wastewater collection maintenance, customer service, inspections, and infiltration & inflow programs. The Repair and Excavation section of the Water Distribution and Collection Division is responsible for all manhole, sanitary sewer main and service lateral repairs and has 13 team members. See *Appendix X – Organizational Structure* for the Water Utilities' entire organizational chart.

Water Distribution & Collection Division



SAFETY

The City of Naperville is firmly committed to providing a safe and healthy environment for its employees, citizens, contractors, and the public. Safety is a key objective and value that must not be compromised.

The Water Utilities' team members are trained on all Illinois Department of Labor, Occupational Safety and Health Administration and other existing Federal and State regulations. All safety training records are filed with the City of Naperville's Safety group.

All safety equipment is inspected as required by all Federal, State and Local regulations. Annually all fall protection and confined space equipment is inspected by a certified third-party competent person(s).

TRAINING

Training Collection and Pumping staff is a key component to further the goal of zero SSOs and elimination of I&I. Training is provided year-round by subject matter experts that work within the Utility and the City as well as external industry professionals in a variety of settings (field, shop, classroom, hands-on) that allow for a full range of learning opportunities and practice putting skills into place. To meet CMOM training goals, Collection and Pumping staff reviews or is trained on the following subjects on an annual basis:

- Emergency Operating Procedures (EOP) - Staff are trained how to use the EOP and how to respond to an emergency.
- Sanitary Sewer Cleaning – Staff reviews standard operating procedures and equipment operation and adjust the SOP as needed as new technologies or equipment is incorporated to operations.
- Manhole Inspections - Staff receives refresher training on correct procedures for completing NASSCO Tier 1 Manhole inspections. All C&P staff are NASSCO MACP certified and are required to get re-certified every three years.
- Lift Station operation and maintenance – Staff have refresher training on all lift stations and the general operation and maintenance at each station and have a general understanding of the characteristics of each station.
- Customer Service Procedures – Staff are trained how to interact professionally with customers (residents) during any type of customer call out including those that occur during non-wet and wet-weather conditions that occur in the private sanitary sewer lateral. Staff is also familiar with promoting the City's Backflow Prevention Reimbursement Program.
- NASSCO/CCTV Training – All Collection & Pumping staff are required to be PACP, LACP, and MACP certified. This certification standardizes the coding and methods of closed-circuit televising of mainlines, service laterals, and manhole inspections. This standardization makes identifying defects that cause I&I easier. NASSCO recertification is required every three years.

- Infiltration and Inflow - As part of the NASSCO training and section training, staff are trained how to recognize sources of I&I.
- Wet Weather Procedures - Staff are trained annually on how to operate pump stations, set up bypass pumping equipment, prevent overflows/backups, and on how to educate the customer on the causes of a wet weather backup and the prevention.

New employees receive additional and more personalized training depending on their experience and background. On the job training consists of all new employees being partnered with an experienced team member where they are trained on all job duties needed to operate the collection system in a safe and efficient manner. Job training is reviewed with all new employees several times during the six-month probationary period. New Employees are trained on but not limited to:

- Equipment Operation and Maintenance
- City, Departmental & Section Policy and Procedures
- Safe Driving Course
- Confined Space/Fall Protection
- Electrical Safety
- Traffic/Work Zone Safety and Flagger Certification
- Fire Safety
- CPR/First Aid

Staff are continuously trained throughout the year, especially on new policies, procedures, or equipment. Training on equipment is provided by the vendor of the equipment and usually consists of a half day or more training on the equipment which includes time in the field learning how to operate the equipment correctly, efficiently and most importantly, safely. Other training opportunities available to staff are professional seminars and conferences, technical courses at local community colleges, and hands-on demonstrations of new or emerging equipment and technologies that could be incorporated into our daily operations.

All training is signed and documented.

SANITARY SEWER CLEANING

The Wastewater collection system is maintained by two cleaning crews using Vactor combination trucks. These combination sewer cleaners combine high-pressure water jetting and a high-flow vacuum source to scour pipes clean and vacuum up the material to restore and maintain normal sewer flow. Specialized nozzles or root cutting equipment is utilized with the high pressure water to thoroughly clean the sanitary sewer mains. On average, over one million feet of sanitary sewer is cleaned annually.

The entire Wastewater collection system is cleaned every five years. A flushing/cleaning schedule is updated as scheduled maintenance is completed. The flushing/cleaning schedule is reviewed and updated with all operators on an annual basis and adjusted as needed to maintain the system.

In addition to the annual flushing schedule, there is also a Preventative Maintenance Schedule (PMS) for those areas that require additional cleanings throughout the year. The PMS schedule includes areas of monthly, quarterly, semi-annual and annual cleaning. The schedule also includes areas of monthly visual inspections of manholes (Hot Spots), areas cleaned for rehabilitation and inverted siphon cleaning.

Please see the below appendices for sewer cleaning procedures and schedules.

Appendix Y – Sewer Cleaning Procedure

Appendix Z - Jet Flushing Schedule

Appendix AA - Hot Spot Checks

Appendix BB - Preventive Maintenance Schedule

UNPLANNED MAINTENANCE

Most of all wastewater collection system maintenance and repairs are planned predictive and preventive maintenance. At times, unplanned maintenance or repair may occur because of conditions discovered during the predictive or preventive maintenance program(s) or in an emergency. As with all work done in the wastewater collection system, if an unplanned maintenance or repair situation occurs a work order is created in the City's CMMS. The work is completed and tracked with the CMMS. See *Appendix HH* for an example of an unplanned work order.

SEWER USE ORDINANCE

Chapter 2 in Title 8 of the City of Naperville's Municipal Code covers both water and wastewater ordinances. These ordinances cover installation, inspection, maintenance and repair of the water and wastewater systems.

Section 8-2B-4 Building Sewers contains several ordinances that cover the use, permits, construction specifications, and connection to the public sewer.

Ordinance 79-127, 10-15-1979 covers Construction Specifications, Connections to the Public Sewer, Prohibited Connections to the Public Sewer, Inspections and Excavations.

Ordinance 79-127, 10-15-1979 covers the Responsibility for Maintenance and Repairs.

A copy of the City of Naperville Municipal Code and Water/Wastewater ordinances can be found on the City of Naperville's website.

FATS, OILS AND GREASE (FOG)

The City of Naperville has not had an issue with a grease SSO since 2013. This is due to the Naperville Water Utilities' Sewer Cleaning Schedule and Hot Spot checks. These maintenance practices maintain and prevent SSOs caused by FOG. PMS maps marked "Grease" show the original cause of

the issue in the 1980s' and 1990s'. These areas are cleaned on a regular basis to prevent grease issues in the collection mains. The PMS program for FOG has prevented any issue since the original issues occurred. All areas of the collection system are reviewed annually, or when a building's usage changes or a new building is constructed, for issues with FOG. The review of the public collection system also includes sample testing for grease in various areas of the system. *Appendix CC – Grease Testing Samples and Map* is an example of the lab report for grease testing along with the map where samples are taken.

Responsibilities of Commercial Establishments for Fats, Oils, and Grease can be found in Title 4 of the Naperville Municipal Code "Commercial Grease Collections and Storage."

Required Treatment and Control Facilities including Grease/Sand Interceptors, Preliminary Treatment Facilities and Control Manholes can be found in Title 8, Chapter 2 (8-2B-13) of the Naperville Municipal Code. (Ordinance 79-127,10-15-1979).

The City of Naperville has submitted an Industrial User Inventory to USEPA in accordance with the NPDES permit. Provisions are in place to begin implementation of a pretreatment program upon notification by USEPA that a program is required.

REIMBURSEMENT PROGRAMS

Naperville Water Utilities' "Back Flow Prevention Program" offers any wastewater customer that has experienced a wastewater back-up due to flooding a 75%-25% cost sharing program. The City of Naperville will reimburse the customer 75% of the cost of any wastewater back flow device installed at the affected property. The customer must qualify first by contacting the Collection and Pumping Supervisor to discuss eligibility. A copy of the packet can be found in *Appendix K*.

The "Storm Water Disconnection Program" is also a cost sharing program to disconnect any device that allows storm water to enter the wastewater collection system. This program is also available for any City of Naperville wastewater customer. See *Appendix DD – Stormwater Disconnection Program.*

Any storm water connection to the wastewater collections system is a violation of Ordinance 02-137, 6-4-2002. The property owner will have 60 days to make all repairs. If the repairs are not made in the time frame, water service may be affected.

WET WEATHER STORAGE LAGOONS

Naperville Water Utilities operates two wet weather storages lagoons. One lagoon is located at 1200 West Ogden Avenue and the other is located at 1800 South Washington Street. These lagoons are used for storing excess inflow and infiltration that has entered the collection system during heavy rainfall periods. After the excess storage lagoon(s) are no longer needed, the water in the lagoons is drained back into the collection system for proper treatment. *See Appendix EE – Wet Weather Storage Lagoons* for the City's procedures for operating these lagoons.

Flow to both lagoons are monitored by the City's SCADA system per IEPA permit IL0034061. *Appendix EE* also shows how the lagoons are used and when flow is diverted to them.

THIRD-PARTY NOTIFICATION PLAN

The City of Naperville is proactive in working to prevent releases of sanitary sewage into the environment. If/when a Sanitary Sewer Overflow happens, the City of Naperville's "Third-Party Notification Plan" will be followed. Below are the steps of the Third-Party Notification Plan.

IEPA Notification

The IEPA will be notified of all SSOs caused by flooding, main sewer line issues or sanitary sewer pump station failures within 24 hours of the SSO event. The IEPA notification shall be completed by phone or electronically by email. Within ten days, a "Sanitary Sewer Overflow or Bypass Notification Summary Report" with sample results shall be mailed to the IEPA.

Notification of City of Naperville Parties – All SSOs are reported to

Darrell Blenniss
Water Utilities Director
(630) 305-5320
Blennissd@naperville.il.us

If an SSO affects any Public Works stormwater, street, or other public right-of-way asset

Dick Dublinski
Director of Public Works
(630) 420-6752
Dublinskid@naperville.il.us

Springbrook Water Reclamation Center Laboratory Notification

Lisa McNames
Regulatory Compliance Manager
(630) 420-6121
Mcnamesl@naperville.il.us

Joe Slevnik
Water Reclamation Manager
(630) 420-6125
slevnikj@naperville.il.us

Public Notification

Determined by the affected area. All notifications are sent out by the City of Naperville Community Relations group. The Water Utilities Director and Communications Manager will review and approve all communications prior to their release via:

- City of Naperville Website
- Naper Notify
- Local Newspaper

It may be necessary to contact other parties outside of the City of Naperville, depending on the location of the SSO(s). Below is the list of other parties who may be contacted in the event of an SSO:

- Naperville Park District 630-848-5000
- DuPage County Forest Preserve 630-933-7200
- Will County Forest Preserve 815-727-8700
- DuPage County 630-407-6500
- Will County 815-722-5515
- Naperville Township 630-355-2786
- DuPage Township 630-759-1317
- Lisle Township 630-968-0057
- Wheatland Township 630-717-0092
- Village of Bolingbrook 630-226-8800
- Village of Plainfield 815-436-7093

All Third-Party notification will include:

- Where the SSO(s) occurred
- What caused the SSO(s)
- Areas affected by the SSO(s)
- Response action for the SSO(s)
- City of Naperville contact person for any questions or concerns regarding an SSO(s)

CITY OF WARRENVILLE

The City of Naperville treats wastewater for the City of Warrenville as depicted in *Appendix A - Service Area Map*. *Appendix FF – City of Warrenville Contract* details the agreement between Naperville and Warrenville. Warrenville's wastewater is conveyed two ways to the Raymond Road Trunk Sewer:

- Gravity feed from the City of Warrenville
- Pumped from the Cantera area

From the Raymond Road Truck Sewer, the wastewater flows to the Northwest Wastewater Pump Station where it is pumped to the Springbrook Interceptor. From the Springbrook Interceptor, the wastewater is gravity fed to the Springbrook Water Reclamation Center.

Below are the assets of the City of Warrenville collection system:

- 10 sanitary lift stations
- 50 miles of sanitary sewer
- 2 miles of force main
- Pipe sizes range from 8" – 27" sanitary sewer, 4" – 12" forcemains
- Pipe materials include concrete, plastic, ductile iron, truss, clay
- 1,239 precast manholes

- Number of customers 4,839

CITY OF WARRENVILLE I&I PROGRAM

The City of Warrenville is currently working on an eleven (11) year I&I plan in eleven (11) basins. The City of Warrenville is working with Engineering Enterprises Incorporated, RMS Utility Services, Midwest Water Group, and ADS Environmental on this program. The City of Warrenville also owns a lateral launching camera for sanitary service lateral inspections. Additional I&I work being done includes:

- A smoke testing program will begin in November 2019.
- Manhole inspection program with RMS Utility Services is underway.
- GIS updates are ongoing.

Warrenville Contact Information:

John Satter | Utility Division Supervisor
3S346 Mignin Drive, Warrenville, IL 60555
P: 630-836-3051 | F: 630-393-1869
jsatter@warrenville.il.us

CMOM COMMUNICATION

The City of Naperville's CMOM program can be viewed at any time on the City of Naperville's website. The CMOM program can also be viewed during normal business hours at the Naperville Water Service Center located at 1200 West Ogden Ave, Naperville.

CMOM ANNUAL REVIEW

The City of Naperville WD&C Division will conduct an annual review of the CMOM program's performance from the previous year, identifying areas of change and improvement that will be discussed in a team meeting format. This review will also serve as the basis for the development of the annual CMOM update report to be submitted to the Illinois EPA. Additionally, WD&C may call team meetings throughout the year as necessary to discuss and improve the CMOM program.

CMOM ANNUAL REPORT

Per the City of Naperville's NPDES permit, an annual CMOM report will be submitted to the IEPA each year. This report will contain, at a minimum, the following information:

- Summary of previous year results
- Review of system performance including a summary of all SSO events that occurred
- Asset Management Plan
- System Evaluation Plan including I&I reductions measures implemented
- Maintenance Plan including:
    - Pipe rehabilitation
    - Manhole repair, replacement and rehabilitation
    - All CCTV inspections

- Sanitary service lateral work/rehabilitation
- Pump/lift station maintenance, repairs and upgrades
- Forcemain work
- Asset management plan ongoing development
- Any updates to the "Overflow Response Plan"
- Any updates to the "Third Party Notification Plan"

Previous year's results will be reviewed to monitor effectiveness of the CMOM program and changes made as needed. Appendices will also be updated annually or as needed.

Each November, the city will put a draft progress report out for public review similar to the initial public review process. In late December, a finalized summary will be sent to the IEPA.

SYSTEM EVALUATION PLAN

Summary of existing SSO and Excessive I&I areas in the system and sources of contribution:

ADS Environmental is contracted to produce an annual Rainfall Derived Inflow and Infiltration (RDII) report. The City of Naperville uses the annual RDII report to evaluate areas of excessive I&I. *Appendix II* is a summary of the 2018 RDII excessive areas of I&I.

The 1st graph/summary shows the RDII volumes expressed in the Percent of rainfall (Capture Coefficient) four storms in 2018 producing the highest peak flows for the measuring period. There is not a definitive threshold of Capture coefficient that is bad, but in general values of 5% to 7% are in the marginal range and greater values are in the severe range. General values for Gal/LF/Inch in the 7 to 15 are in the marginal range and greater values are in the severe range. The values are generally higher in long soaking events that cause the ground to be saturated.

The 2nd graph summary displays the RDII volume expressed in Gallons/LF of sewer/Inch of rainfall the same four storms in 2018 producing the highest peak flows for the measuring period. This normalization method eliminates the low bias resulting from a basin with a low housing density or a basin containing large areas of un-sewered land such as parks, sports fields, cemeteries, etc.

Evaluate plans to reduce I&I and eliminate SSOs:

The City is developing a long-range rehabilitation plan, including cost. The 10-year I&I Reduction plan is required to be submitted to the IEPA at a later date.

Evaluate the effectiveness and performance in efforts to reduce excessive I&I in the collection system:

As stated above, The City of Naperville Water Utilities has a very aggressive I&I program. *Appendix JJ* displays the effectiveness of the City's I&I reduction and sanitary sewer rehabilitation plan. This include the WWTP flow reduction showing City wide I&I reduction results, Prescott Flow Meter Basin I&I reduction results and additional results from the I&I plan.

In addition, the City conducts an annual RDII study of all basin areas. The RDII study shows areas of improvement due to rehabilitation and maintenance activities as well as areas where conditions may be static or worsening. The RDII is reviewed each year to better target rehabilitation and maintenance activities.

Special provisions for pump station and force main and other special components:

All information for the wastewater lift station/pump station, force mains and special components is on pages 8 and 13 of this CMOM Report. The Capital Improvement Plan for the wastewater lift/pump stations is in the CMOM report in *Appendix H*.

Construction plans and schedules for correction to meet IEPA I&I standards:

The City is in the process of developing a ten (10) year wastewater collection rehabilitation plan to continue the elimination of I&I and prolong the life of the collection system assets. The plan will include costs, locations, year(s) and quantities. Below are the assets that will be included in the 10-year rehabilitation plan:

- Interceptor/Trunk Sewers
- Gravity Main
- Laterals
- Lift/Pump Stations
- Manholes
- Inverted Siphons.

All plans and schedules will be evaluated annually and updated to meet the needs of the collection system. The overview of the 10-year rehabilitation plan is shown in *Appendix LL*. The detailed ten-year plan will be submitted to the IEPA at a later date and will be incorporated into this CMOM once completed.

ASSET MANAGEMENT

The City has an ongoing asset management program for sanitary sewer assets. Data from the City's GIS system, CMMS system (Cityworks) and CUES Granite Net CCTV inspection records are used to assess the condition of various assets. The CMMS system also contains a database of cleaning, inspection, lining, spot repairs and other maintenance and repair activities.

The City uses a risk-based approach to analyze and prioritize maintenance and repairs to the sanitary sewer system. Data collected from the various systems, including GIS, Cityworks, CUES, and InfoSWMM is used to develop Probability of Failure (PoF) and Consequent of Failure (CoF) criteria for each sanitary sewer collection system asset. These criteria are used to calculate a Business Risk Exposure (BRE) score for each asset. The BRE score is used to help target the City's resources in the most efficient way possible to optimize performance of the collection system, to eliminate SSO's and other system problems.

The Asset Management Strategy will confirm that necessary programs and financial resources are in place to ensure the long-term sustainability of the collection system.

A draft Asset Management Strategy is provided in *Appendix MM*.

CAPACITY ASSESSMENT

The City is in the process of developing a comprehensive hydraulic model of the sanitary sewer collection system using Innovyze InfoSWWM modeling software. The model will incorporate actual flow monitoring data, as well as actual and projected land uses, to accurately depict the capacity of the sanitary sewer system. This model will help to identify capacity deficiencies, if any, in the collection system, and will allow for the modeling of various solutions. The model will also provide assurance that adequate capacity exists downstream to allow for new development and changing land uses.

A schedule of remaining modeling activities and a proposed timeline is presented in *Appendix NN*.

An Ultimate Wastewater Flow and Loading Evaluation for Springbrook Water Reclamation Center was conducted in 2019. The final study document is attached as *Appendix OO*.

APPENDICES

Appendix A - Service Area Map (Naperville/Warrenville)

Appendix B - Sewer Basin with Pipe Sizes

Appendix C - City Wide Sanitary Sewer Mains

Appendix D - Divertible Location Maps

Appendix E - Gravity Main Age

Appendix F - Siphon Location Map

Appendix G – Monthly Utility Rates and Charges

Appendix H - 2020 Capital Improvement Budget

Appendix I - 2020 Operations & Maintenance Budget

Appendix J – Customer Service Handout

Appendix K – Backflow Prevention Reimbursement

Appendix L – Emergency Operation Plan (EOP).

Appendix M - Overflow Response Plan

Appendix N - Permanent Flow Monitoring Map

Appendix O – Temporary Flow Monitoring Map

Appendix P – Rain Gauge Map

Appendix Q – SSO Monitoring Map

Appendix R – Flow Reduction Examples.

Appendix S – Lift Station Monthly and Semi-Annual Inspections

Appendix T – CCTV Inspection Schedule

Appendix U – Manhole Inspections Type 1

Appendix V – Naperville Construction Standards

Appendix W – Manhole Testing New Construction

Appendix X – Organization Structure

Appendix Y –Sewer Cleaning Procedure

Appendix Z - Jet Flushing Schedule

Appendix AA - Hot Spot Checks

Appendix BB - Preventive Maintenance Schedule

Appendix CC – Grease Testing Samples and Map

Appendix DD – Stormwater Disconnect Program

Appendix EE – Wet Weather Storage

Appendix FF – City of Warrenville Contract

Appendix GG – Maintenance Goal Tracking Data

Appendix HH- Unplanned Maintenance Work Order

Appendix II – System Evaluation

Appendix JJ – Program Effectiveness

Appendix KK – SSO Work Order Tracking

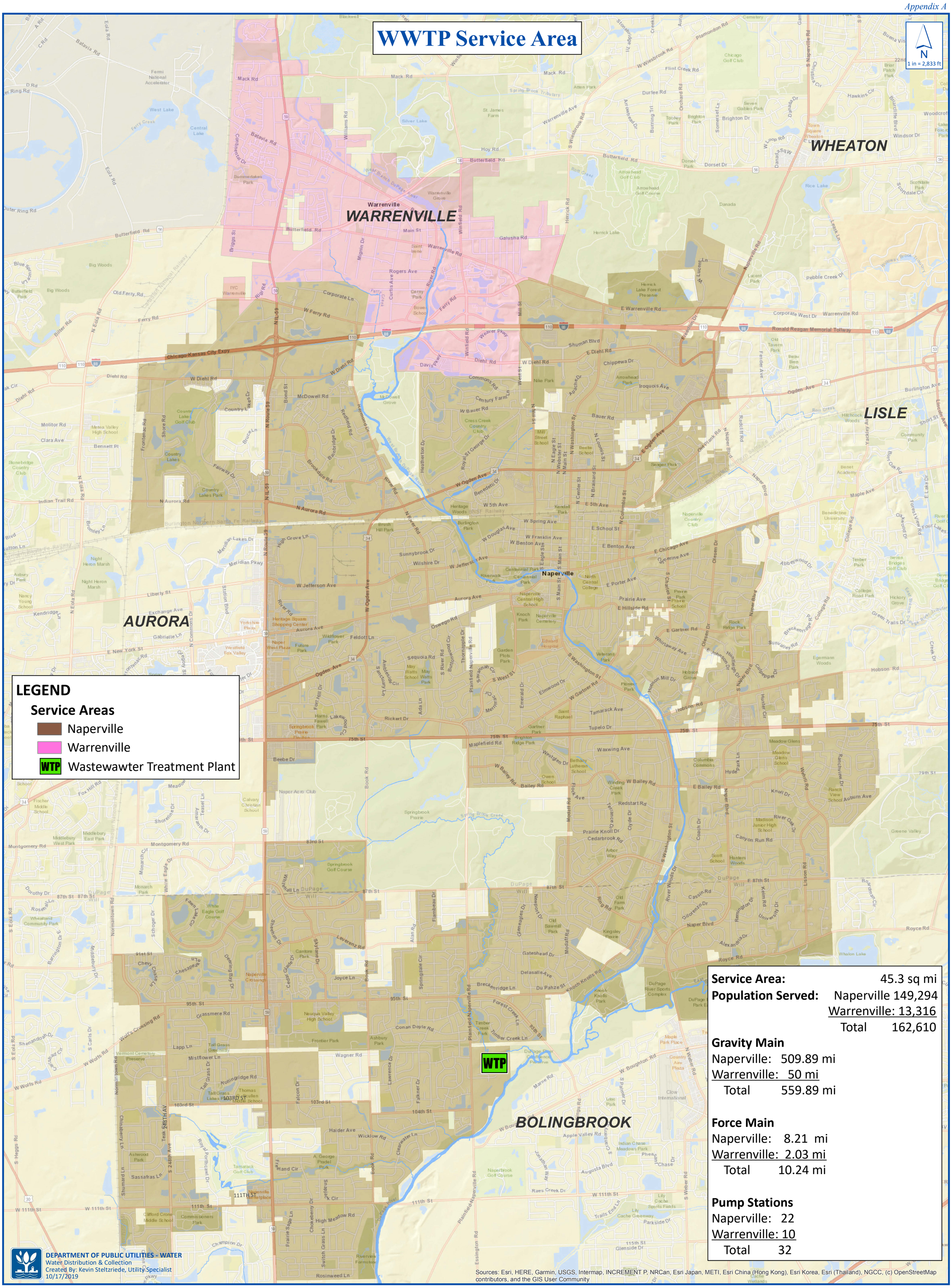
Appendix LL – 10-Year I&I Plan Overview

Appendix MM – Draft Asset Management Strategy

Appendix NN – Hydraulic Modeling Activities Schedule

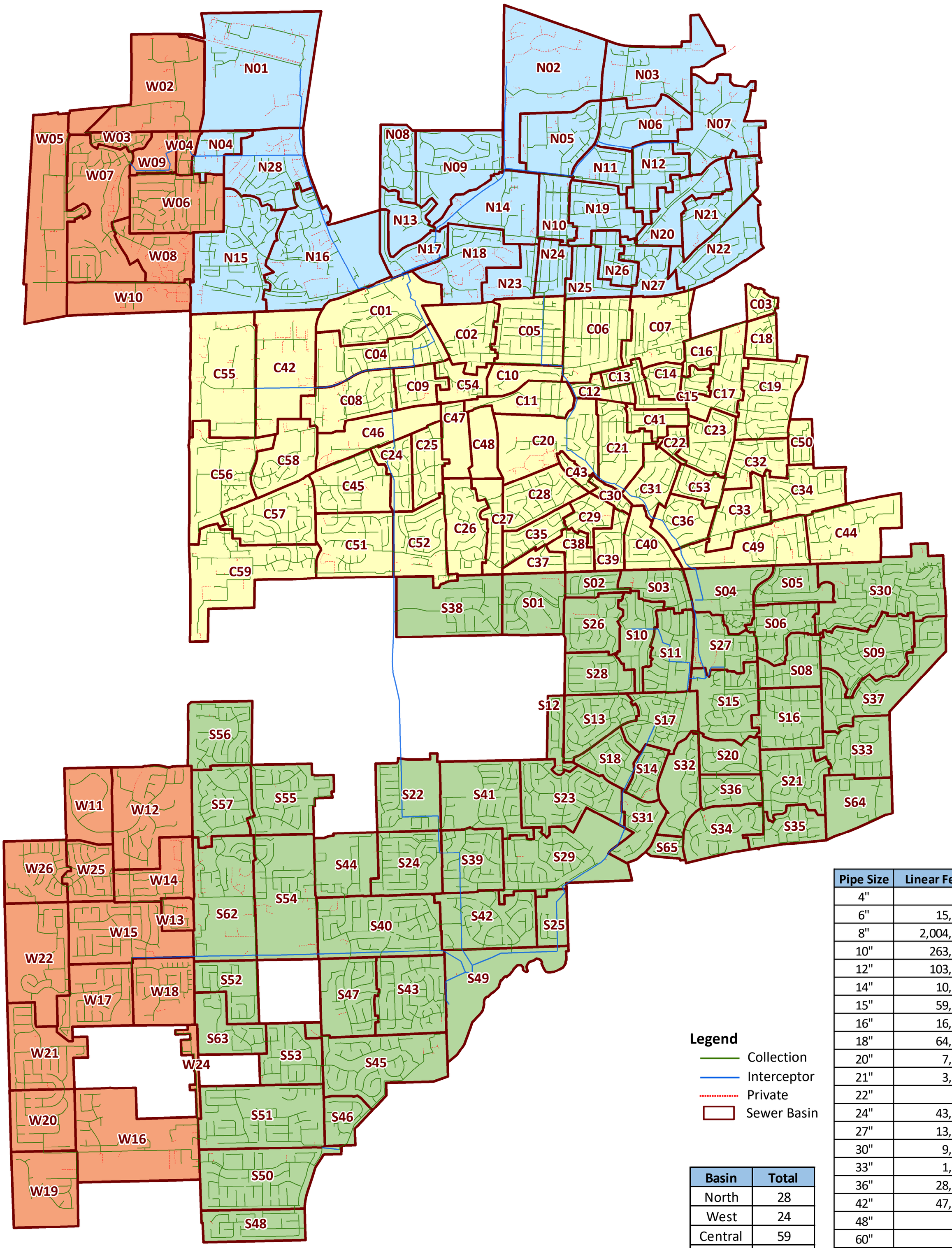
Appendix OO – 2019 SWRC Ultimate Wastewater Flow and Loading Evaluation

WWTP Service Area



Sanitary Sewer Basins

N
1 in = 2,500 ft


N01
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S62
S63
S64
S65

Legend

- Collection
- Interceptor
- Private
- Sewer Basin

Basin	Total
North	28
West	24
Central	59
South	59
Total	**170**

Pipe Size	Linear Feet
4"	43
6"	15,147
8"	2,004,640
10"	263,231
12"	103,515
14"	10,172
15"	59,114
16"	16,137
18"	64,013
20"	7,926
21"	3,490
22"	282
24"	43,057
27"	13,412
30"	9,324
33"	1,465
36"	28,729
42"	47,724
48"	426
60"	292
Unknown	710
Total	**2,692,849**

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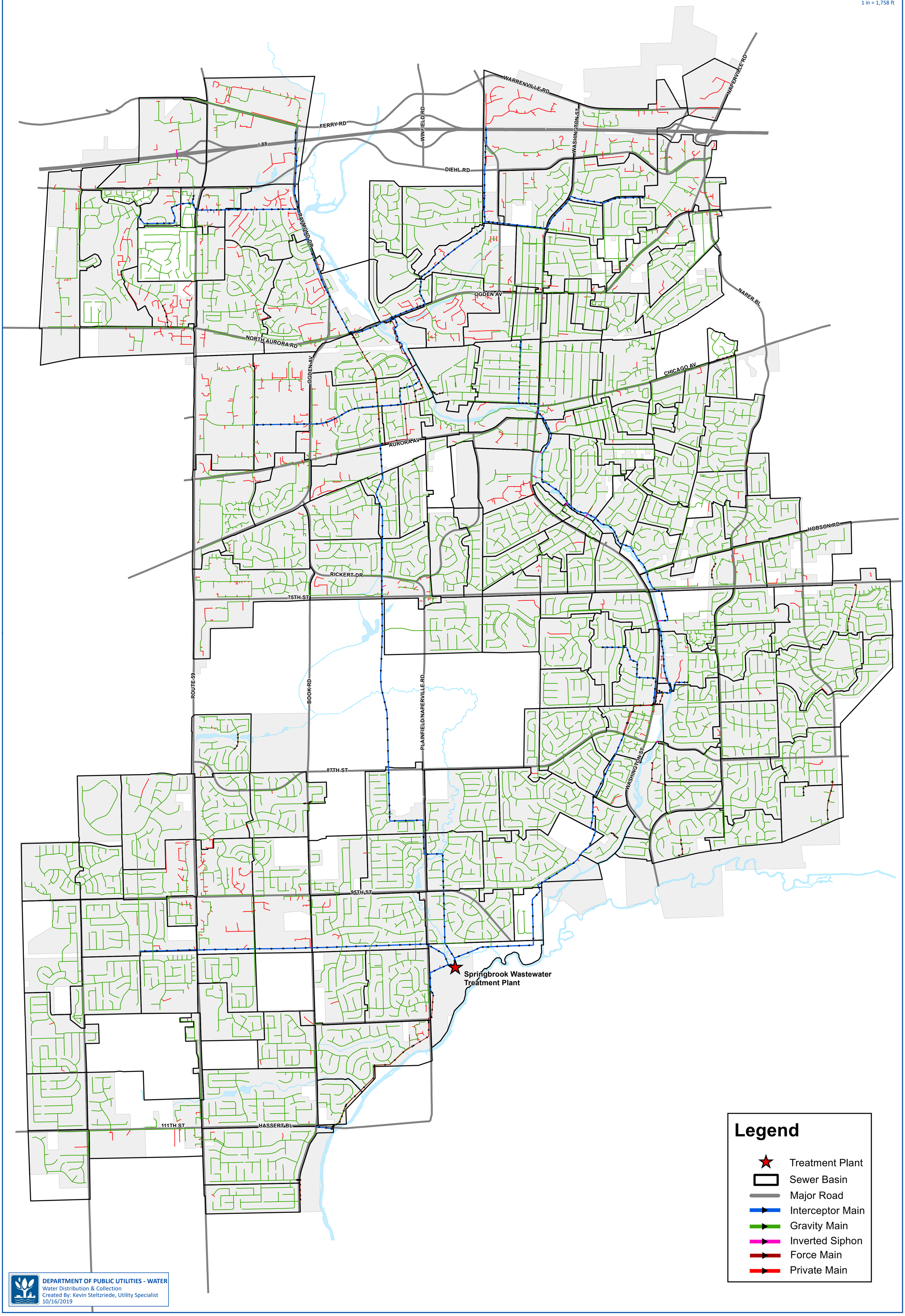
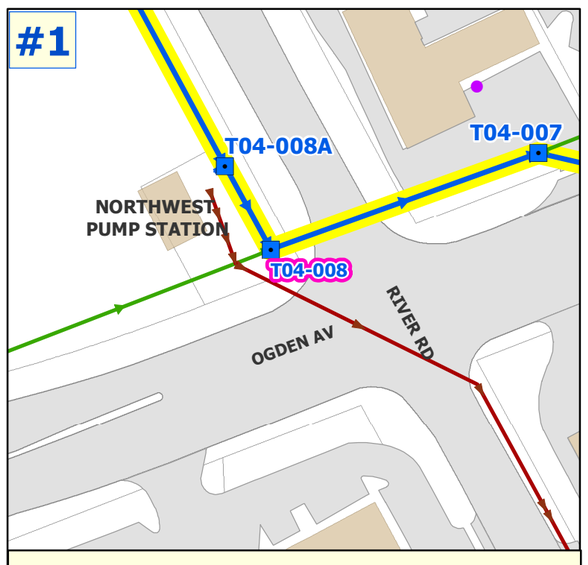
10/16/2019

Naperville Sanitary Sewer System

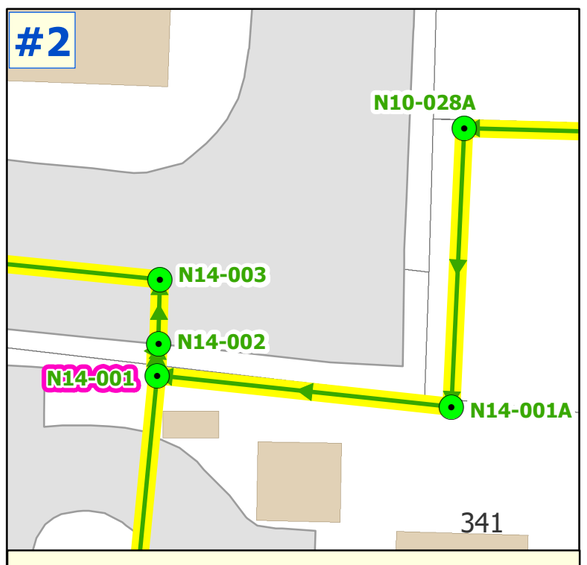


SANITARY SEWER DIVERTIBLES
GRAVITY MAINS, MANHOLES & VALVES

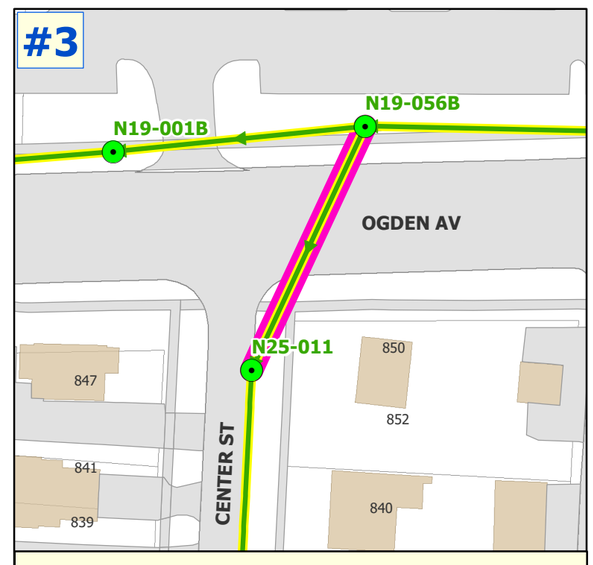
N
Not to Scale



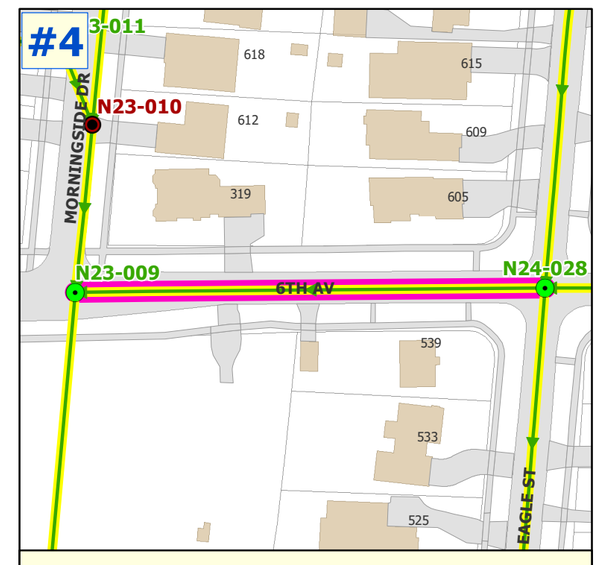
Northwest Pump-NOC
Divertible Valve in MH T04-008
Used during high flows to divert excess flow to NOC



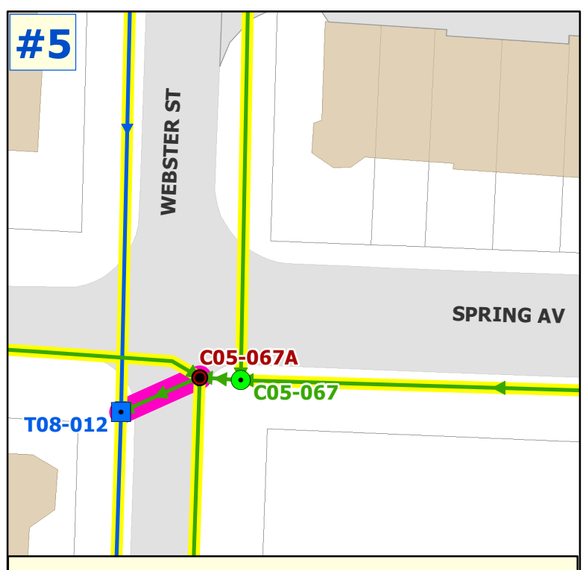
Ogden Manor
Divertible Valve in MH N14-001
Diverts flow between NOC/SOC
Approx. 400,000 gpd diverted to SOC



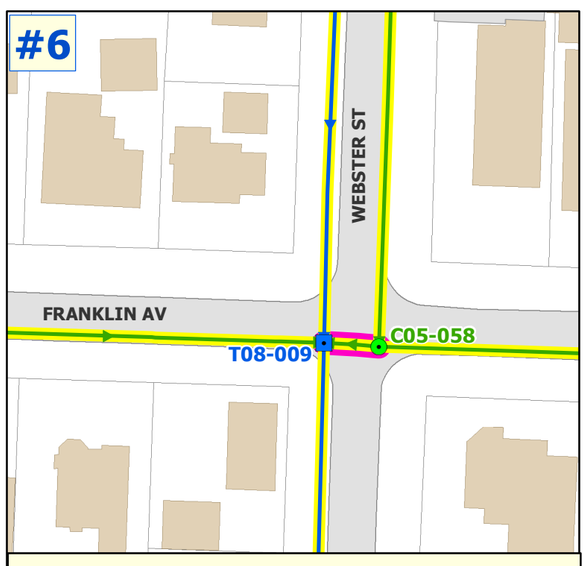
Center St - Ogden Divertible
Gravity Main
Diameter = 8" Length = 140'
Lined 2013 CIPP



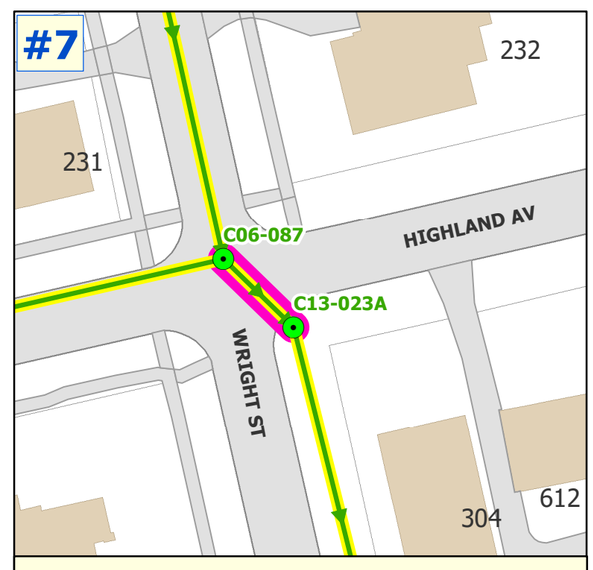
6th Av - Eagle Divertible
Gravity Main
Diameter = 8" Length = 355'
Lined 2006 CIPP



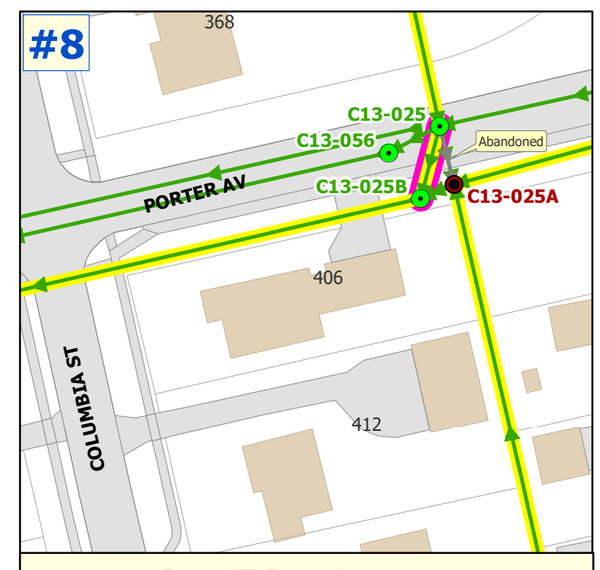
Spring - Webster Divertible
Gravity Main
Diameter = 15" Length = 30'
Clay



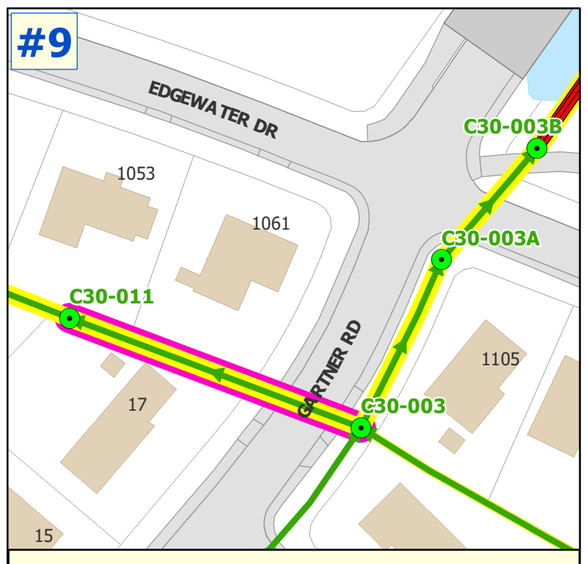
Franklin - Webster Divertible
Gravity Main
Diameter = 8" Length = 28'
Lined 2007 CIPP



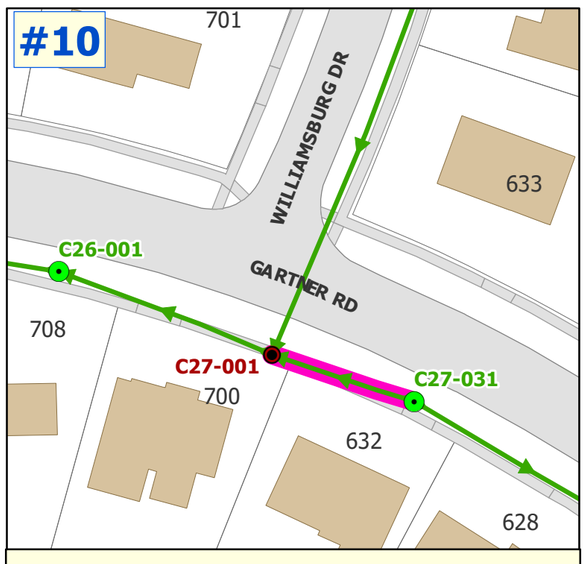
Highland Av Divertible
Gravity Main
Diameter = 8" Length = 39'
Lined 2005 CIPP



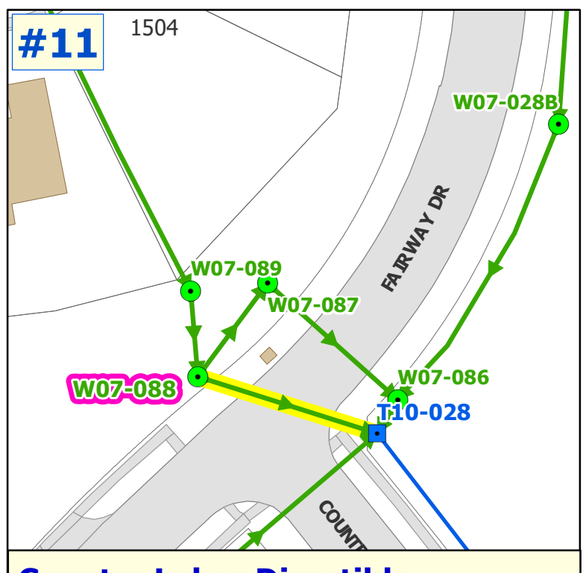
Porter Divertible #2
Gravity Main
Diameter = 12" Length = 37'
Lined 2005 CIPP



Edgewater Divertible
Gravity Main
Diameter = 12" Length = 195'
Lined 2004 CIPP

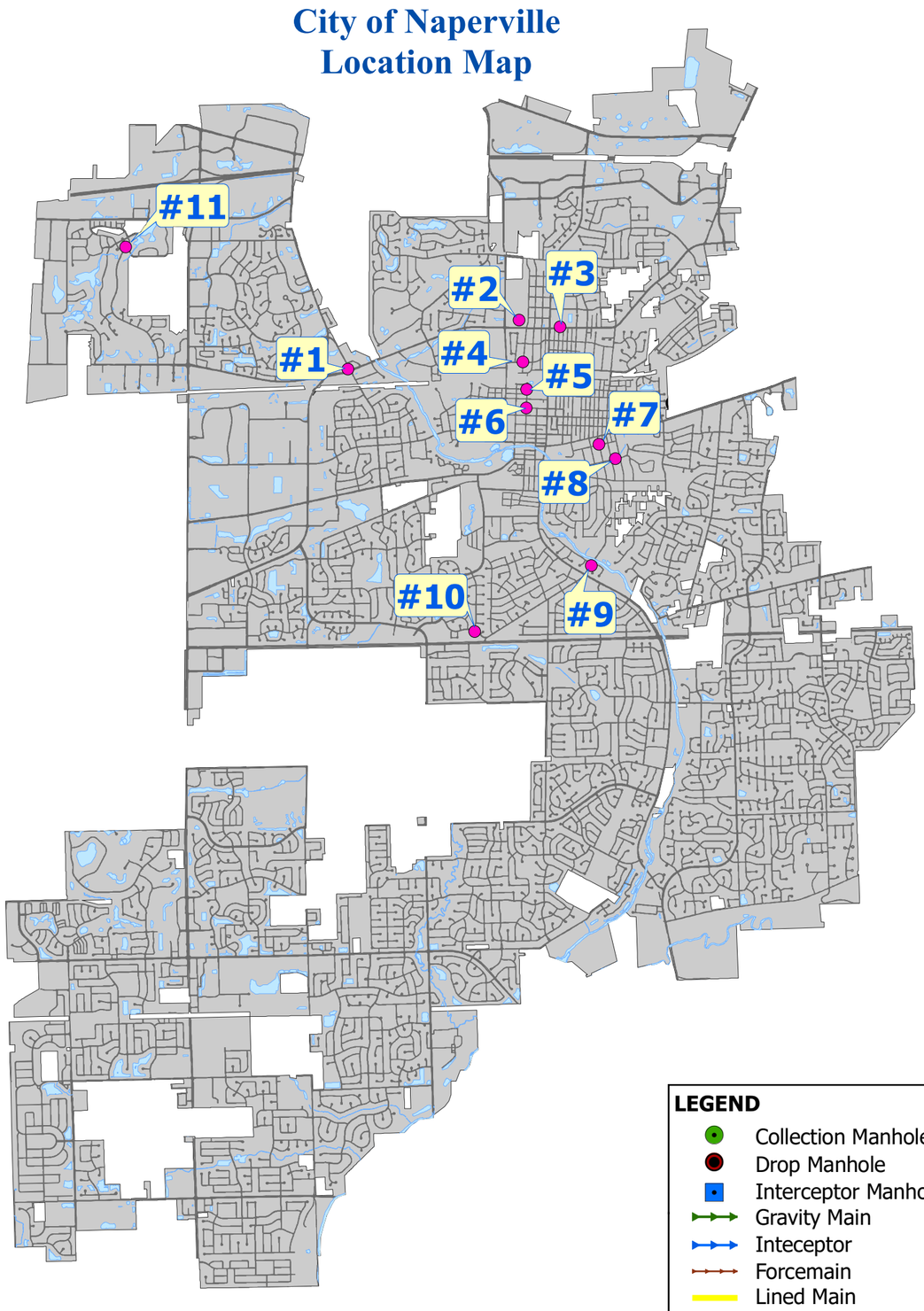


Gartner - Williamsburg Divertible
Gravity Main
Diameter = 8" Length = 70
Clay



Country Lakes Divertible
Divertible Manhole W07-088
Used to control excess flows due to pipe capacity limits

City of Naperville
Location Map



LEGEND
- Collection Manhole
- Drop Manhole
- Interceptor Manhole
- Gravity Main
- Inteceptor
- Forcemain
- Lined Main
- Divertible

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Water Distribution & Collection
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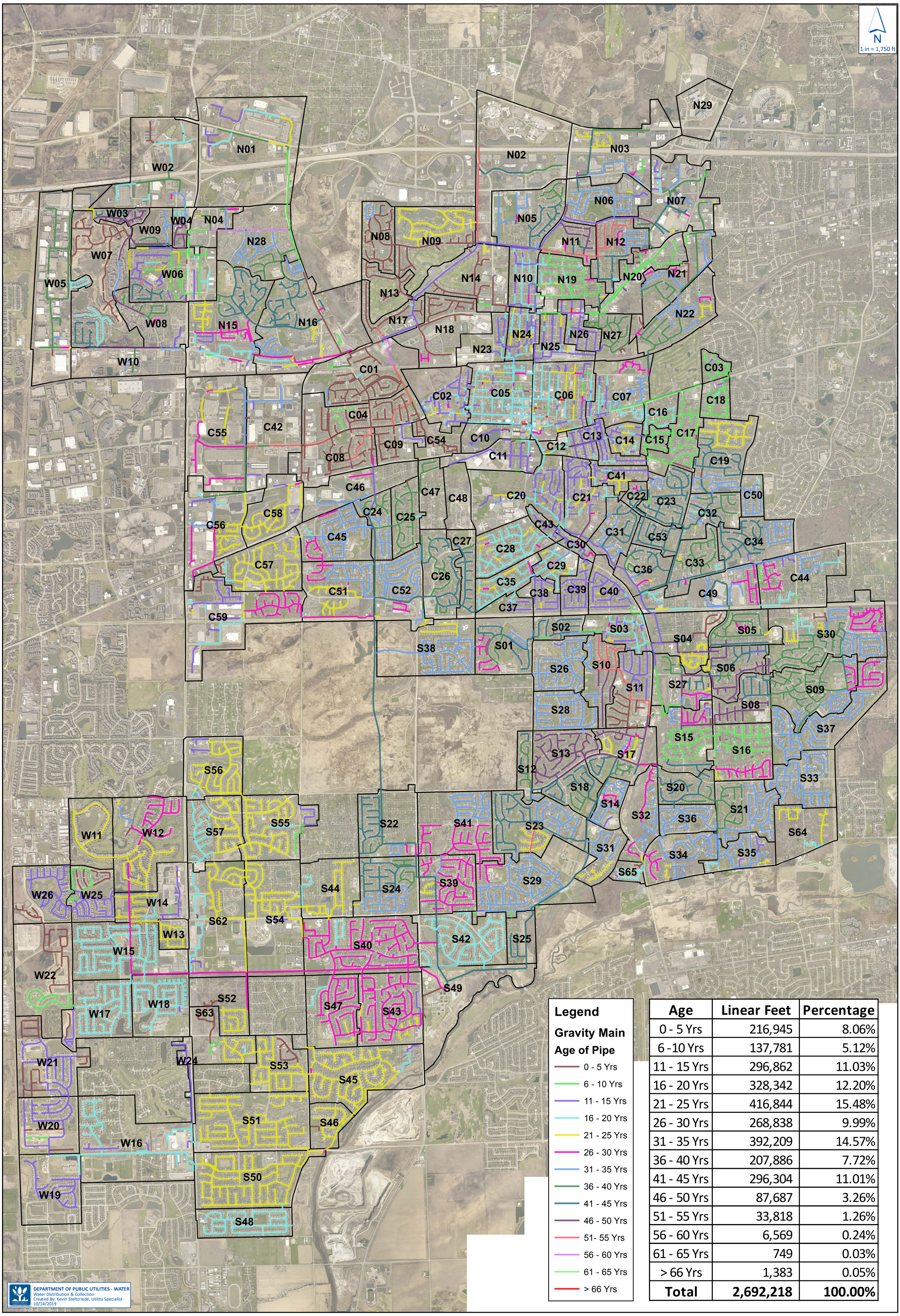
10/16/2019

Sanitary Gravity Main Age



Legend

Gravity Main Age of Pipe

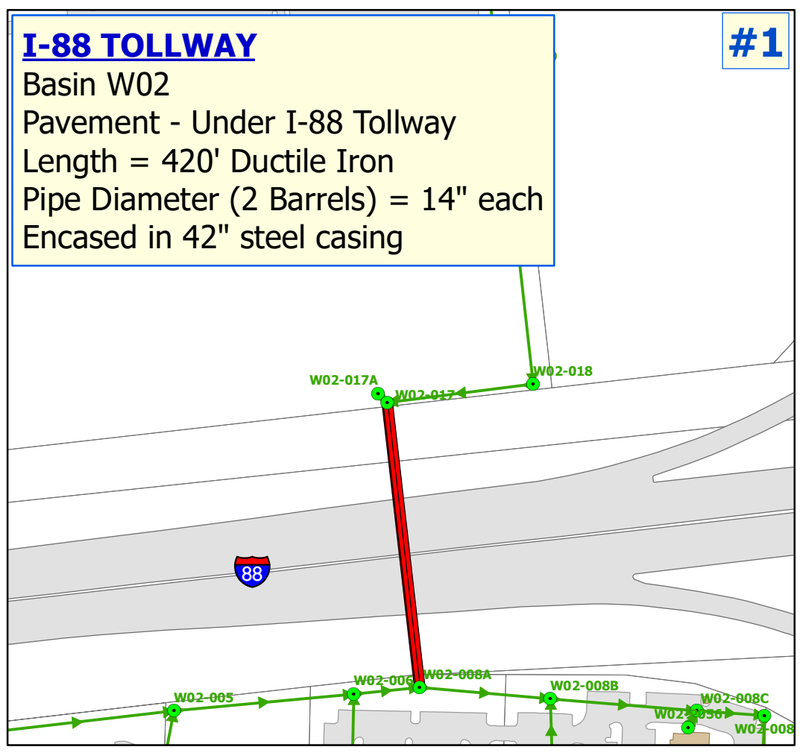
- 0 - 5 Yrs
- 6 - 10 Yrs
- 11 - 15 Yrs
- 16 - 20 Yrs
- 21 - 25 Yrs
- 26 - 30 Yrs
- 31 - 35 Yrs
- 36 - 40 Yrs
- 41 - 45 Yrs
- 46 - 50 Yrs
- 51- 55 Yrs
- 56 - 60 Yrs
- 61 - 65 Yrs
- > 66 Yrs

Age	Linear Feet	Percentage
0 - 5 Yrs	216,945	8.06%
6 -10 Yrs	137,781	5.12%
11 - 15 Yrs	296,862	11.03%
16 - 20 Yrs	328,342	12.20%
21 - 25 Yrs	416,844	15.48%
26 - 30 Yrs	268,838	9.99%
31 - 35 Yrs	392,209	14.57%
36 - 40 Yrs	207,886	7.72%
41 - 45 Yrs	296,304	11.01%
46 - 50 Yrs	87,687	3.26%
51 - 55 Yrs	33,818	1.26%
56 - 60 Yrs	6,569	0.24%
61 - 65 Yrs	749	0.03%
> 66 Yrs	1,383	0.05%
Total	**2,692,218**	**100.00%**

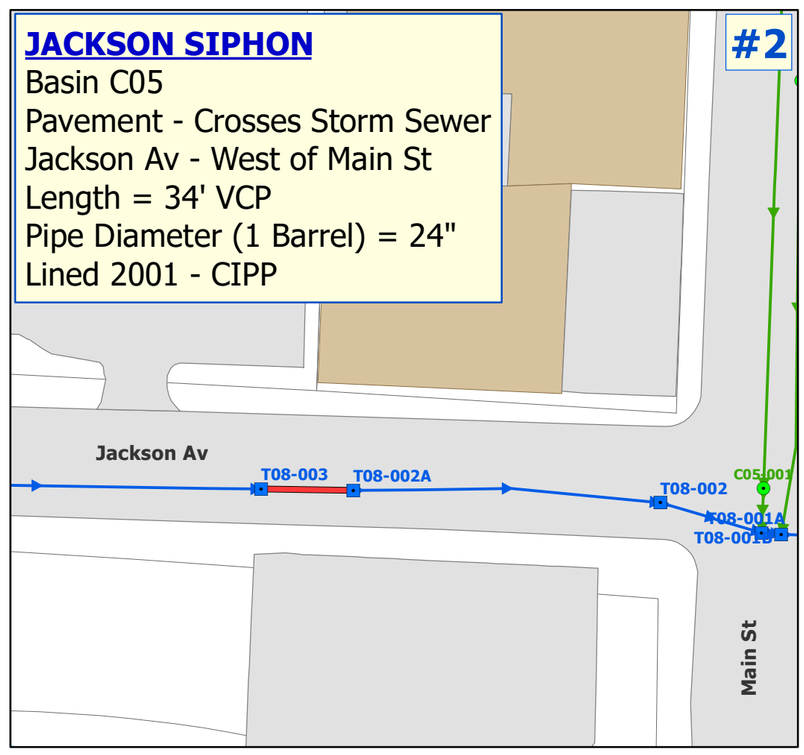
Sanitary Sewer Siphons

N

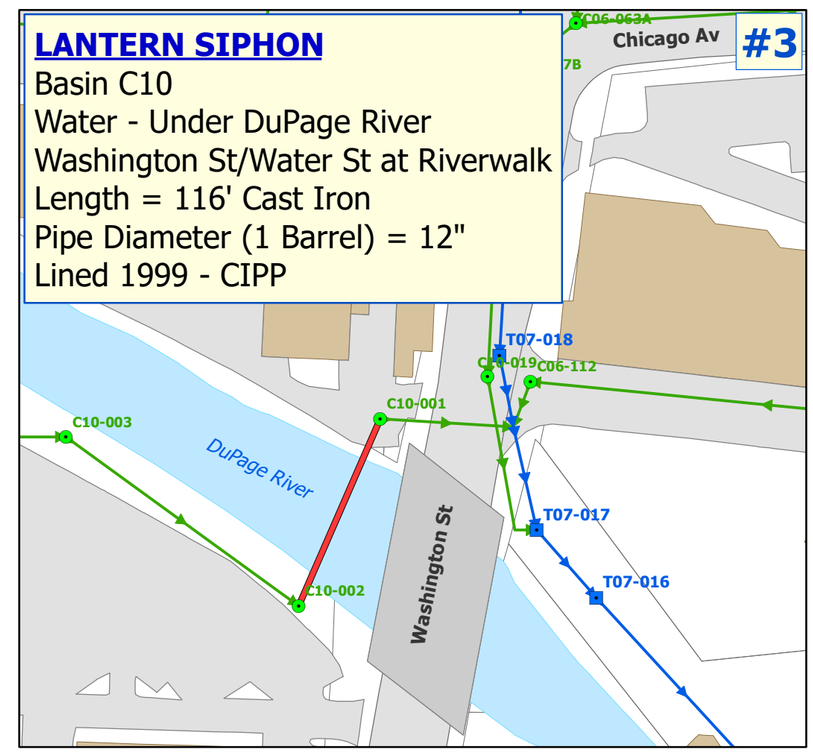
I-88 TOLLWAY
Basin W02
Pavement - Under I-88 Tollway
Length = 420' Ductile Iron
Pipe Diameter (2 Barrels) = 14" each
Encased in 42" steel casing



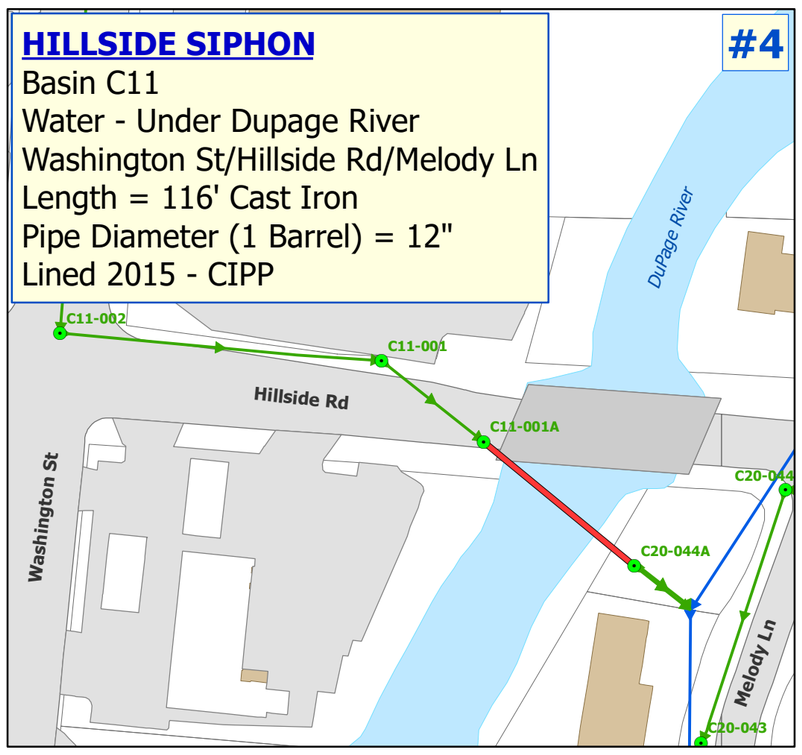
JACKSON SIPHON
Basin C05
Pavement - Crosses Storm Sewer
Jackson Av - West of Main St
Length = 34' VCP
Pipe Diameter (1 Barrel) = 24"
Lined 2001 - CIPP



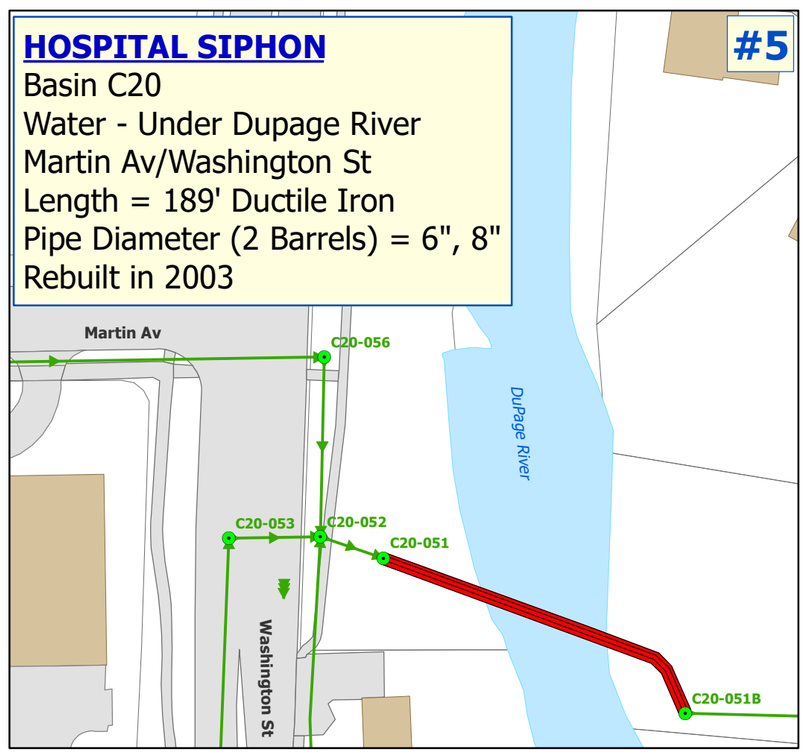
LANTERN SIPHON
Basin C10
Water - Under DuPage River
Washington St/Water St at Riverwalk
Length = 116' Cast Iron
Pipe Diameter (1 Barrel) = 12"
Lined 1999 - CIPP



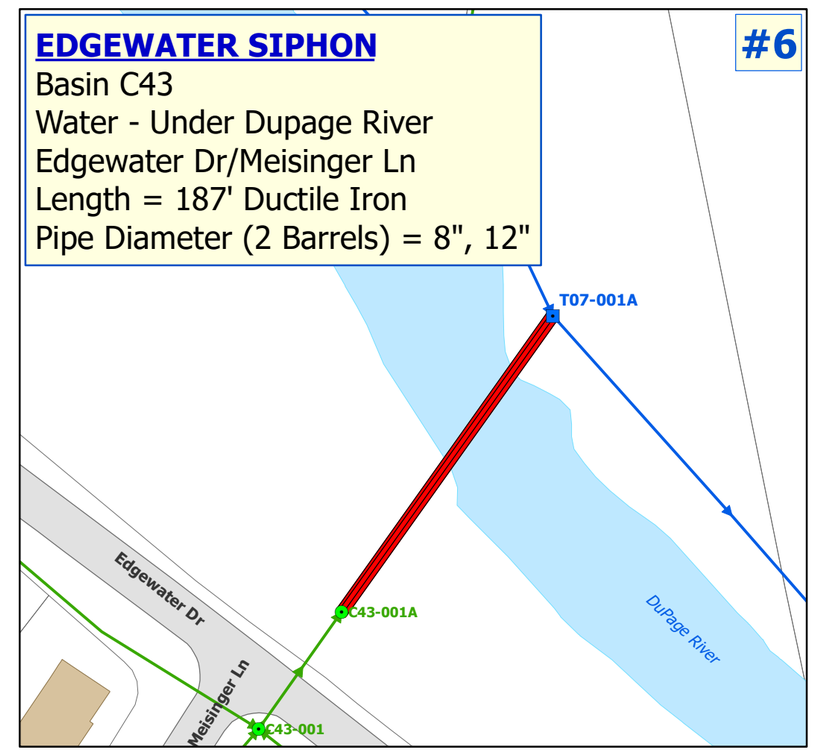
HILLSIDE SIPHON
Basin C11
Water - Under Dupage River
Washington St/Hillside Rd/Melody Ln
Length = 116' Cast Iron
Pipe Diameter (1 Barrel) = 12"
Lined 2015 - CIPP



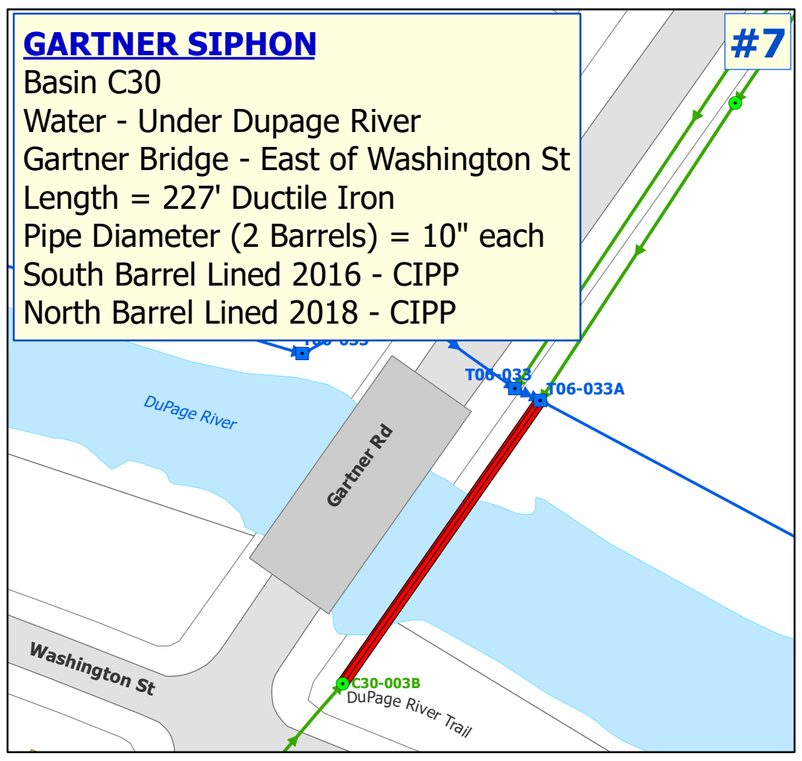
HOSPITAL SIPHON
Basin C20
Water - Under Dupage River
Martin Av/Washington St
Length = 189' Ductile Iron
Pipe Diameter (2 Barrels) = 6", 8"
Rebuilt in 2003



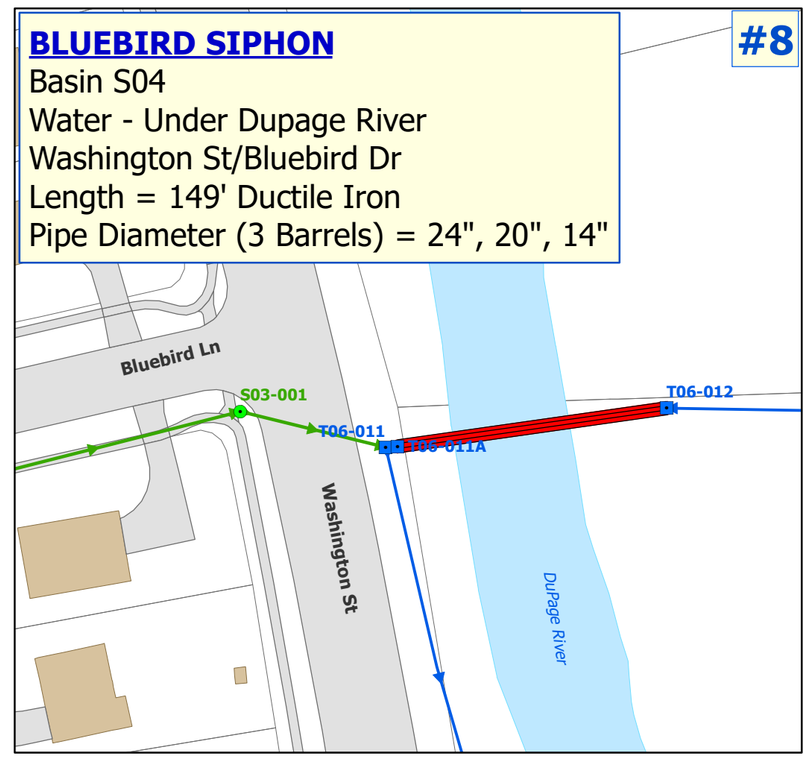
EDGEWATER SIPHON
Basin C43
Water - Under Dupage River
Edgewater Dr/Meisinger Ln
Length = 187' Ductile Iron
Pipe Diameter (2 Barrels) = 8", 12"



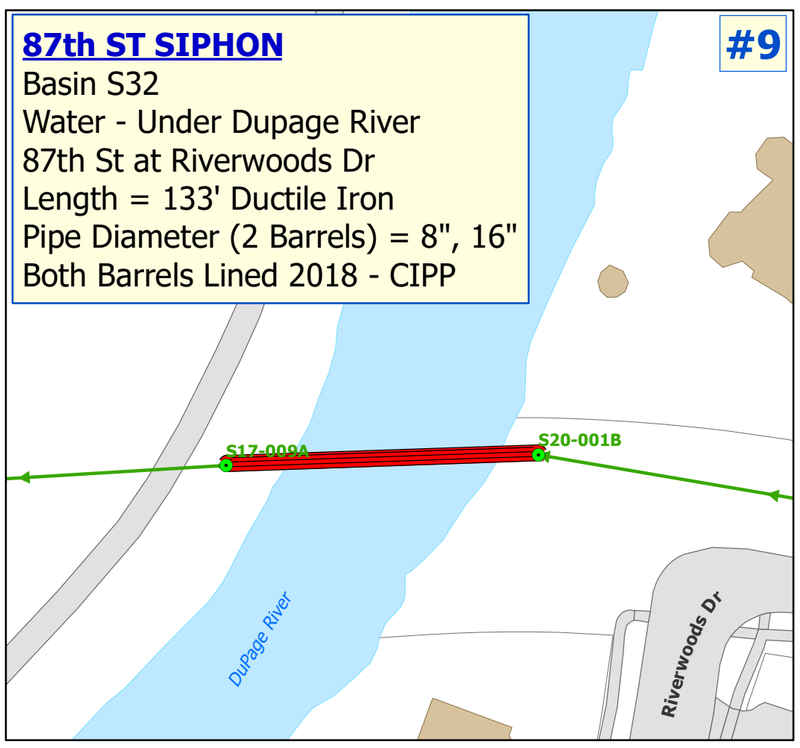
GARTNER SIPHON
Basin C30
Water - Under Dupage River
Gartner Bridge - East of Washington St
Length = 227' Ductile Iron
Pipe Diameter (2 Barrels) = 10" each
South Barrel Lined 2016 - CIPP
North Barrel Lined 2018 - CIPP



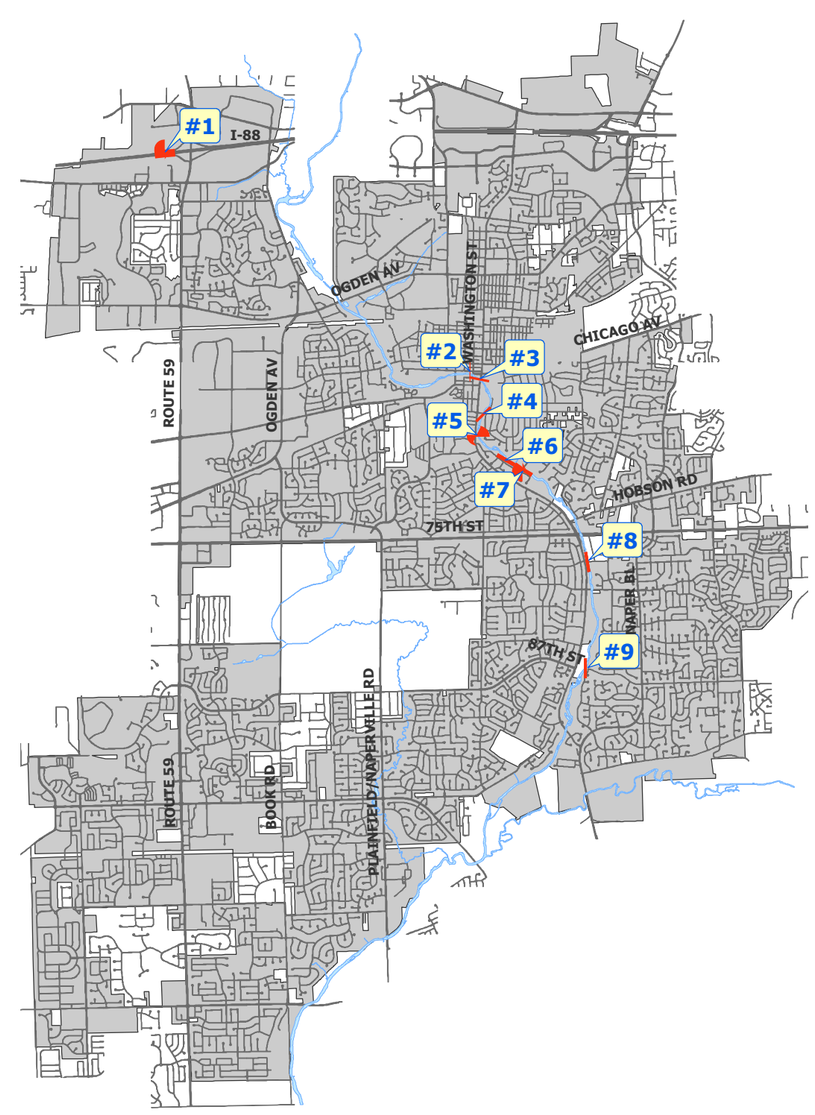
BLUEBIRD SIPHON
Basin S04
Water - Under Dupage River
Washington St/Bluebird Dr
Length = 149' Ductile Iron
Pipe Diameter (3 Barrels) = 24", 20", 14"



87th ST SIPHON
Basin S32
Water - Under Dupage River
87th St at Riverwoods Dr
Length = 133' Ductile Iron
Pipe Diameter (2 Barrels) = 8", 16"
Both Barrels Lined 2018 - CIPP



Sewer Siphon Location Key



DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019

CURRENT AND FUTURE WATER UTILITY RATES AND CHANGE IN MONTHLY UTILITY BILLS

May 1, 2019

WATER - RESIDENTIAL

	2018 (January 1)	2018 (May 1)	2019 (January 1)	**2019 (May 1)**	2020 (January 1)	2021 (January 1)
Wholesale Water Rate (DWC) per 1,000 gallons	$4.88	$4.94	$4.94	**$4.97**	*$4.97*	*$4.97*
Retail Rate (City of Naperville) per 1,000 gallons	$2.34	$2.34	$2.47	**$2.47**	$2.62	$2.73
Total Volumetric Rate	$7.22	$7.28	$7.41	**$7.44**	$7.59	$7.70
Monthly Customer Charge	$6.43	$6.43	$6.84	**$6.84**	$7.30	$7.63
Wholesale Water Rate (DWC) per 100 Cubic Feet	$3.65	$3.70	$3.70	**$3.72**	*$3.72*	*$3.72*
Retail Rate (City of Naperville) per 100 Cubic Feet	$1.75	$1.75	$1.85	**$1.85**	$1.96	$2.04
Total Volumetric Rate	$5.40	$5.45	$5.55	**$5.57**	$5.68	$5.76
Monthly Customer Charge	$6.43	$6.43	$6.84	**$6.84**	$7.30	$7.63
Average Monthly Residential Water Bill for 8,000 Gallons Used (1,069 Cubic Feet)	$64.16	$64.69	$66.17	**$66.38**	$67.99	$69.74
Change in Monthly Bill from Previous Year	$4.03	$0.53	$1.48	**$0.21**	$1.82	$1.75
% Change in Bill from Prior Year	6.72%	0.83%	2.29%	**0.32%**	3.59%	1.74%
Average Monthly Residential Water Bill for 5,610 Gallons Used (750 Cubic Feet)	$46.93	$47.31	$48.47	**$48.62**	$50.28	$51.21
Change in Monthly Bill from Previous Year	$3.14	$0.38	$1.16	**$0.15**	$1.81	$0.93
% Change in Bill from Prior Year	7.17%	0.81%	2.45%	**0.31%**	3.73%	1.85%

WATER - NON-RESIDENTIAL

	2018 (January 1)	2018 (May 1)	2019 (January 1)	**2019 (May 1)**	2020 (January 1)	2021 (January 1)
Block 1 (Consumption to 100,000 Cubic Feet)						
Wholesale Water Rate (DWC) per 100 Cubic Feet	$3.65	$3.70	$3.70	**$3.72**	*$3.72*	*$3.72*
Retail Rate (City of Naperville) per 100 Cubic Feet	$1.65	$1.65	$1.74	**$1.74**	$1.85	$1.92
Total Volumetric Rate	$5.30	$5.35	$5.44	**$5.46**	$5.57	$5.64
Block 2 (Consumption Over 100,000 Cubic Feet)						
Wholesale Water Rate (DWC) per 100 Cubic Feet	$3.65	$3.70	$3.70	**$3.72**	*$3.72*	*$3.72*
Retail Rate (City of Naperville) per 100 Cubic Feet	$0.97	$0.97	$1.02	**$1.02**	$1.09	$1.13
Total Volumetric Rate	$4.62	$4.67	$4.72	**$4.74**	$4.81	$4.85

CURRENT AND FUTURE WATER UTILITY RATES AND CHANGE IN MONTHLY RESIDENTIAL UTILITY BILLS

May 1, 2019

WASTEWATER

	2018 (January 1)	2018 (May 1)	2019 (January 1)	**2019 (May 1)**	2020 (January 1)	2021 (January 1)
Rate (per 100 Cubic Feet)	$1.96	$2.33	$2.46	**$2.46**	$2.61	$2.71
Monthly Customer Charge	$8.70	$9.91	$10.02	**$10.02**	$10.07	$9.85
Monthly Phosphorus Surcharge	$0.50	$1.00	$1.80	**$1.80**	$1.80	$1.80
Average Monthly Residential Wastewater Bill for 8,000 Gallons Used (1,069 Cubic Feet)	$30.15	$35.82	$38.12	**$38.12**	$39.77	$40.62
Change in Monthly Bill from Previous Year	$1.89	$5.67	$2.30	**$2.30**	$1.65	$0.85
% Change in Bill from Prior Year	6.69%	18.81%	6.42%	**6.42%**	4.33%	2.14%
Average Monthly Residential Wastewater Bill for 5,610 Gallons Used (750 Cubic Feet)	$23.90	$28.39	$30.27	**$30.27**	$31.45	$31.98
Change in Monthly Bill from Previous Year	$1.53	$4.49	$1.88	**$0.00**	$1.18	$0.53
% Change in Bill from Prior Year	6.84%	18.79%	6.62%	**0.00%**	3.90%	1.69%

Combined Water and Wastewater Monthly Residential Utility Bill for 8,000 Gallons (1,069 Cubic Feet)

	2018 (January 1)	2018 (May 1)	2019 (January 1)	**2019 (May 1)**	2020 (January 1)	2021 (January 1)
Average Monthly Residential Utility Bill for 8,000 Gallons Used (1,069 Cubic Feet)	$94.31	$100.51	$104.29	**$104.50**	$107.76	$110.36
Change in Monthly Bill from Previous Year	$3.35	$6.20	$3.78	**$0.21**	$3.47	$2.60
% Change in Bill from Prior Year	3.85%	6.57%	3.76%	**0.20%**	3.86%	2.41%

Combined Water and Wastewater Monthly Residential Utility Bill for 5,610 Gallons (750 Cubic Feet)

Average Monthly Residential Utility Bill for 5,610 Gallons Used (750 Cubic Feet)	$70.83	$75.70	$78.74	**$78.89**	$81.73	$83.19
Change in Monthly Bill from Previous Year	$2.62	$4.87	$3.04	**$0.15**	$2.99	$1.46
% Change in Bill from Prior Year	4.03%	6.88%	4.02%	**0.19%**	3.80%	1.79%

DEPARTMENT OF PUBLIC UTILITIES - WATER & WASTEWATER
FY2020-24 CAPITAL IMPROVEMENT PROGRAM -- DRAFT

Appendix H

Updated: 9/30/2019

Project No.	Project Description	FY2019 Adopted	FY2019 Actuals	FY2020 Proposed	FY2021 Proposed	FY2022 Proposed	FY2023 Proposed	FY2024 Proposed
		$11,921,000	$11,579,987	$23,395,000	$21,029,500	$16,356,000	$14,345,000	$15,615,000
WU	**WATER UTILITY:**							
	WATER DISTRIBUTION SYSTEM							
WU004	**Rehabilitation / Replacement - Mains**	**$700,000**	**$950,912**	**$1,200,000**	**$1,094,500**	**$3,881,000**	**$790,000**	**$750,000**
	Miscellaneous Replacements	$450,000	$0	$0	$50,000	$50,000	$50,000	$50,000
	Bid # Royal St. George Watermain- Carryover	$0	$475,387	$0	$0	$0	$0	$0
	Naperville Heights Watermain Replacement	$0	$0	$0	$0	$3,100,000	$0	$0
	Springdale Circle	$0	$0	$0	$427,500	$0	$0	$0
	Naper Blvd at Woodbrook	$0	$0	$0	$217,000	$0	$0	$0
	Oswego Road and River Road	$0	$0	$0	$0	$531,000	$0	$0
	Raymond & Forestview	$0	$0	$0	$0	$0	$540,000	$0
	Fairway Drive	$0	$0	$0	$0	$0	$0	$500,000
	RR Crossings (Critical RR, River, Arterial)	$250,000	$0	$0	$0	$0	$0	$0
	Bid #19-168 2019 Watermain Lining Projects	$0	$236,325	$0	$0	$0	$0	$0
	Watermain Lining Projects	$0	$0	$200,000	$200,000	$200,000	$200,000	$200,000
	Downtown Streetscape- Watermain	$0	$20,000	$1,000,000	$0	$0	$0	$0
	School Isolation Valves	$0	$0	$0	$200,000	$0	$0	$0
	RFP 19-207 Risk & Resiliency Assessment (CDM Smith)	$0	$99,200	$0	$0	$0	$0	$0
	RFP 19-208 Water Utilities Asset Prioritization & CIP Development	$0	$120,000	$0	$0	$0	$0	$0
WU037	**Lead Service Replacements**	**$25,000**	**$25,000**	**$25,000**	**$25,000**	**$25,000**	**$25,000**	**$200,000**
WU005	**Water Utility Infrastructure Relocation - Miscellaneous Locations**	**$25,000**	**$25,000**	**$625,000**	**$25,000**	**$25,000**	**$25,000**	**$25,000**
	Water Utility Infrastructure Relocation - Misc. Locations - Mains, Services, Valves, Hydrants	$25,000	$0	$25,000	$25,000	$25,000	$25,000	$0
	Water Main Relocation - North Aurora Road West of Rt. 59	$0	$0	$600,000	$0	$0	$0	$0
		$0	$0	$0	$0	$0	$0	$0
WU008	**Water Main Oversizing Payments - New Developments**	**$250,000**	**$356,852**	**$25,000**	**$25,000**	**$25,000**	**$25,000**	**$25,000**
	Leigh Subdivision	$0	$71,685	$0	$0	$0	$0	$0
	8th/Center oversizing and extension	$200,000	$267,912	$0	$0	$0	$0	$0
	Best Buy Carpet & Granite (12" WM crossing)	$25,000	$17,255	$0	$0	$0	$0	$0
	Tailoring by Monica watermain extension	$25,000	$0	$0	$0	$0	$0	$0
WU010	**WU10 Water Main Additions / Extensions**	**$100,000**	**$15,000**	**$60,000**	**$1,050,000**	**$50,000**	**$50,000**	**$0**
	Water Main Additions - Misc. Locations	$50,000	$0	$50,000	$50,000	$50,000	$50,000	$0
	SSA Projects- various	$10,000	$0	$0	$0	$0	$0	$0
	Washington St DuPage River Crossing	$40,000	$15,000	$10,000	$1,000,000	$0	$0	$0
		$0	$0	$0	$0	$0	$0	$0
	DISTRIBUTION SYSTEM SUBTOTAL:	**$1,100,000**	**$1,372,764**	**$1,935,000**	**$2,219,500**	**$4,006,000**	**$915,000**	**$1,000,000**
	WATER METERING							
WU019	**Water Metering Additions - New**	**$50,000**	**$0**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**
WU020	**Water Metering - Replacement**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
	Small diameter water meter purchase 18-177	$0	$975,000	$0	$0	$0	$0	$0
	Small diameter water meters install 18-285	$1,200,000	$529,150	$1,200,000	$800,000	$800,000	$800,000	$800,000
	Large Diameter water meters 18-204, contract 855	$1,100,000	$694,489	$1,100,000	$500,000	$500,000	$500,000	$500,000
	1.5-Inch Residential Water Meter Replacement 19-077, contract 1071	$0	$228,500	$0	$0	$0	$0	$0
	ERT / Reading Equipment Replacements	$0	$24,000	$0	$0	$0	$0	$0
WU040	**Automatic Meter Reading Project (AMR/AMI)**	**$0**	**$0**	**$10,000,000**	**$0**	**$0**	**$0**	**$0**
WU041	**Fire Hydrant Replacement Program**	$0	$0	**$150,000**	**$150,000**	**$150,000**	**$150,000**	**$150,000**
WU042	**Water Main Valve Replacement Program**	$0	$0	**$150,000**	**$150,000**	**$150,000**	**$150,000**	**$150,000**
	METERING SUBTOTAL:	**$2,350,000**	**$2,451,139**	**$12,650,000**	**$1,650,000**	**$1,650,000**	**$1,650,000**	**$1,650,000**
	WATER SUPPLY SYSTEM							
WU007	**Misc. Waterworks Improvements**	**$950,000**	**$1,503,670**	**$950,000**	**$2,100,000**	**$900,000**	**$850,000**	**$850,000**
	SWW Pump Replacement	$650,000	$0	$0	$0	$0	$0	$0
	RFP 19-055 Consultant services	$0	$98,427	$0	$0	$0	$0	$0
	FloWay pumps	$0	$132,831	$0	$0	$0	$0	$0
	Valves	$0	$22,412	$0	$0	$0	$0	$0
	Bid #19-216 South Water Works Improvements Construction contract	$0	$650,000	$0	$0	$0	$0	$0
	SWW PAS/CL2 Scrubber Addition	$0	$0	$750,000	$0	$0	$0	$0
	CL2 Upgrades	$0	$0	$200,000	$250,000	$250,000	$0	$0
	NWWW Controls/PumpUpgrades	$0	$250,000	$0	$650,000	$0	$0	$0
	WSWWW Tower Coating	$0	$0	$0	$1,200,000	$0	$0	$0
	SEWW Upgrades	$0	$0	$0	$0	$650,000	$0	$0
	SWWW Upgrades	$0	$0	$0	$0	$0	$650,000	$0
	WSWWW Upgrades	$0	$0	$0	$0	$0	$0	$650,000
	NWWW Hatches	$200,000	$0	$0	$0	$0	$0	$0
	Booster Station Upgrades	$0	$350,000	$0	$0	$0	$200,000	$200,000
WU029	**Emergency Standby Well Rehabilitation**	**$1,100,000**	**$1,449,661**	**$800,000**	**$800,000**	**$800,000**	**$500,000**	**$0**
	RFP 19-085 Improvements to City Well 28 & 31	$0	$81,616	$0	$0	$0	$0	$0
	19-176 Removal and Televising Emergency Standby Deep Wells No. 28 and No. 31	$0	$68,045	$0	$0	$0	$0	$0
	Pre-purchase of well components	$0	$0	$0	$0	$0	$0	$0
	Construction contract	$0	$1,300,000	$0	$0	$0	$0	$0
	Well #31 Rehabilitation	$500,000	$0	$0	$0	$0	$0	$0
	Well #28 Rehabilitation	$600,000	$0	$0	$0	$0	$0	$0
	Well #26 Rehabilitation	$0	$0	$800,000	$0	$0	$0	$0
	Well #19 Rehabilitation	$0	$0	$0	$800,000	$0	$0	$0
	Well #21 Rehabilitation	$0	$0	$0	$0	$800,000	$0	$0
	Well #24 Controls	$0	$0	$0	$0	$0	$500,000	$0
WU039	**Waterworks Pumps & Controls Replacement**	**$0**	**$0**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**
WU033	**SCADA Improvements & Upgrades - Various Waterworks Facilities**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$75,000**	**$75,000**
	SUPPLY SUBTOTAL:	**$2,150,000**	**$3,053,331**	**$1,900,000**	**$5,950,000**	**$3,550,000**	**$2,825,000**	**$1,825,000**
	WATER UTILITY SUBTOTAL:	**$5,600,000**	**$6,877,234**	**$16,485,000**	**$9,819,500**	**$9,206,000**	**$5,390,000**	**$4,475,000**
Rate Model Target >>>		**$5,448,500**	**$5,448,500**	**$7,014,500**	**$6,387,350**	**$3,221,400**	**$4,774,550**	

	Project Description	2019 Adopted	2019 Actual	2020 Proposed	2021 Proposed	2022 Proposed	2023 Proposed	2024 Proposed
WW	**WASTEWATER UTILITY:**							
	SANITARY SEWER SYSTEM							
WW006	**Rehabilitation - Interceptors / Trunk/Mainline Sewers/Services**	**$4,176,000**	**$3,315,543**	**$4,610,000**	**$4,960,000**	**$4,590,000**	**$3,725,000**	**$4,025,000**
	Small Diameter Rehabilitation	$600,000	$509,920	$600,000	$600,000	$600,000	$600,000	$600,000
	T03 NOC South Interceptor Rehabilitation	$500,000	$608,344	$1,000,000	$1,000,000	$0	$0	$0
	T10 McDowell Trunk Sewer Rehabilitation	$0	$0	$0	$0	$1,000,000	$1,000,000	$0
	T01 Springbrook Prairie Interceptor Rehabilitation	$0	**$0**	$0	$0	$0	$0	$1,000,000
	Bluebird Siphon Rehabilitation	$0	$0	$0	$350,000	$0	$0	$0
	Edgewater Siphon Rehabilitation	$0	$0	$0	$0	$300,000	$0	$0
	Other Siphon (TBD)	$0	$0	$0	$0	$0	$300,000	$300,000
	Complete Manhole Replacement	$75,000	$131,420	$120,000	$120,000	$90,000	$75,000	$75,000
	Manhole Rehab - Entire Structure	$150,000	$112,070	$150,000	$150,000	$150,000	$150,000	$150,000
	Manhole Rehab - Upper Structure	$350,000	$353,789	$290,000	$290,000	$0	$0	$300,000
	Service Lateral Rehabilitation	$1,600,000	$1,600,000	$1,600,000	$1,600,000	$1,600,000	$1,600,000	$1,600,000
	T06 South Central Interceptor Bank stabilization	$901,000	$0	$850,000	$850,000	$850,000	$0	$0
SW036	**Stormwater Improvements (Cress Creek Sump Pumps)**	**$50,000**	**$0**	**$50,000**	**$50,000**	**$50,000**	**$0**	**$0**
WW005	**Wastewater Utility Infrastructure Relocation - Miscellaneous Locations**	**$65,000**	**$35,000**	**$385,000**	**$825,000**	**$25,000**	**$375,000**	**$0**
	Downtown Streetscape Improvements- Sanitary	$0	$20,000	$350,000	$0	$0	$0	$0
	Jackson Ave. (Washington to Main) Service Relocations	$0	$0	$0	$0	$0	$350,000	$0
	Chicago Ave. (Brainard to Washington) Improvements	$0	$0	$0	$0	$0	$0	$0
	Washington St. DuPage River Crossing	$40,000	$15,000	$10,000	$800,000	$0	$0	$0
	Wastewater Utility Infrastructure Relocation - Misc. Mains & Services	$25,000	$0	$25,000	$25,000	$25,000	$25,000	$0
WW009	**Sanitary Sewer Oversizing Payments - New Developments**	**$25,000**	**$0**	**$10,000**	**$10,000**	**$10,000**	**$10,000**	**$10,000**
			$0	$0	$0	$0	$0	$0
WW010	**Sanitary Sewer Capacity Improvements**	**$120,000**	**$0**	**$70,000**	**$70,000**	**$570,000**	**$570,000**	**$0**
	Miscellaneous	$100,000	$0	$50,000	$50,000	$50,000	$50,000	$0
	SSA Projects (various)	$20,000	$0	$20,000	$20,000	$20,000	$20,000	$0
	River Road Force Main Discharge	$0	$0	$0	$0	$0	$500,000	$0
	Royal St. George trunk sewer improvements	$0	$0	$0	$0	$500,000	$0	$0
	Jefferson Ave. Capacity Improvements (West St. to Parkway)	$0	$0	$0	$0	$0	$0	$0
	COLLECTION SYSTEM SUBTOTAL:	**$4,436,000**	**$3,350,543**	**$5,125,000**	**$5,915,000**	**$5,245,000**	**$4,680,000**	**$4,035,000**
	WASTEWATER PUMPING / LIFT STATIONS							
WW034	**Lift Station Rehabilitation Program -**	**$560,000**	**$225,720**	**$640,000**	**$400,000**	**$325,000**	**$325,000**	**$325,000**
	NOC/SOC Site Security Improvements	$0	$0	$80,000	$0	$0	$0	$0
	Pump Stations Improvements/Upgrades - SCADA	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000

	Pump Stations Improvements - Unplanned Replacement of Major Components	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000
	Northwest Wastewater Pump Station Improvements/Upgrades 1994	$400,000	$0	$400,000	$0	$0	$0	$0
	Southwest Wastewater Pump Station Improvements/Upgrades 1993	$0	$0	$0	$300,000	$0	$0	$0
	Loomis/Ogden BPS Improvements/Upgrades 1991	$0	$0	$60,000	$0	$0	$0	$0
	Summerfield Pump Station Improvements/Upgrades 1997	$0	$0	$0	$0	$225,000	$0	$0
	Trillium Pump Station Improvements/Upgrades 1998	$0	$0	$0	$0	$0	$225,000	$0
	Bonnema Woods Pump Station Improvements/Upgrades 1998	$0	$0	$0	$0	$0	$0	$225,000
	Golden Larch BPS Improvements/Upgrades 1998	$60,000	$60,000	$0	$0	$0	$0	$0
	Arc Flash RFP 19-164	$0	$65,720	$0	$0	$0	$0	$0
	Forcemain Rehabilitation	$0	$0	$0	$0	$0	$0	$0
	H2S Monitors	$0	$0	$0	$0	$0	$0	$0
	Odor Control (Various Pump Stations)	$0	$0	$0	$0	$0	$0	$0
WW043	**Aero Estates Lift Station (New)**	**$450,000**	**$190,395**	**$0**	**$0**	**$0**	**$0**	**$0**
	LIFT STATIONS SUBTOTAL:	**$1,010,000**	**$416,115**	**$640,000**	**$400,000**	**$325,000**	**$325,000**	**$325,000**
	SPRINGBROOK WATER RECLAMATION CENTER							
WW028	**Replace/Improve Tertiary Filters**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	
WW035	**Phosphorus Removal - Preliminary Engineering (IEPA Requirement)**	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,000,000**	**$2,000,000**
	Engineering	$0	$0	$0	$0	$0	$1,000,000	$2,000,000
	SWRC Digester Hatches	$0	$313,770	$0	$0	$0	$0	$0
WW038	**Roadway Improvements**	**$0**	**$0**	**$75,000**	**$0**	**$50,000**	**$0**	**$50,000**
WW040	**Wastewater Engine Generator**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
	RFP SWRC CIP Evaluation and Facilities Plan	$0	$0	$0	$0	$0	$0	$0
WW041	**Facility Replacements (Non-Treatment)**	**$775,000**	**$925,543**	**$220,000**	**$270,000**	**$380,000**	**$400,000**	**$300,000**
	SWRC CIP Evaluation & Facilities Plan	$0	$0	$120,000	$0	$0	$0	$0
	BioSolids Storage Building Roof Rehab/Replacement	$0	$0	$0	$0	$0	$300,000	$300,000
	Lab AA System Replacement	$0	$0	$0	$100,000	$0	$0	$0
	BioSolids Processing Building Roof Repairs	$110,000	$124,847	$0	$0	$0	$0	$0
	South Blower Building Roof repair	$0	$0	$0	$70,000	$0	$0	$0
	Admin Building Roof Repair	$0	$0	$0	$0	$80,000	$0	$0
	GBT Building Roof Repair	$0	$80,000	$0	$0	$0	$0	$0
	Structural Repairs (aeration, Biosolids storage etc.)	$0	$0	$0	$100,000	$100,000	$100,000	$0
	BioSolids Storage Structural Repairs	$0	$0	$50,000	$0	$0	$0	$0
	Bid #19-193 Aeration Tank No. 3 Walkways Replacement	$0	$81,999	$0	$0	$0	$0	$0
	Aeration Walkway Priority 1 Repairs	$65,000	$0	$50,000	$0	$0	$0	$0
	Administration Building HVAC 19-018	$600,000	$382,840	$0	$0	$0	$0	$0
	Influent Screening Building Duct Heater	$0	$80,857	$0	$0	$0	$0	$0
	BioSolids Processing Building HVAC	$0	$175,000	$0	$0	$0	$0	$0
	Influent screening building HVAC	$0	$0	$0	$0	$200,000	$0	$0
		$0	$0	$0	$0	$0	$0	$0
WW042	**BioSolids Holding Tank (Phase 2)**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$880,000**
WW044	**Miscellaneous Process Related Replacements/Upgrades**	**$100,000**	**$10,553**	**$850,000**	**$4,150,000**	**$50,000**	**$50,000**	**$50,000**
	Disinfection System / ORP Controls Upgrades	$50,000	$0	$0	$0	$0	$0	$0
	Disinfection System / Replace Pumps & Tanks	$0	$0	$0	$0	$0	$0	$0
	UV Disinfection Installation	$0	$0	$800,000	$4,000,000	$0	$0	$0
	Influent Mag Meter Replacements	$0	$0	$0	$100,000	$0	$0	$0
	SCADA/PLC Upgrades	$50,000	$10,553	$50,000	$50,000	$50,000	$50,000	$50,000
WW045	**South Plant Grit Removal & RAS Upgrades & Improvements**	**$0**	**$0**	**$0**	**$475,000**	**$1,100,000**	**$2,500,000**	**$3,500,000**
	Engineering	$0	$0	$0	$75,000	$0	$0	$0
	South Plant Blowers Replacement	$0	$0	$0	$400,000	$0	$0	$0
	South Plant Filter Installation	$0	$0	$0	$0	$1,100,000	$2,500,000	$3,500,000
	SPRINGBROOK SUBTOTAL:	**$875,000**	**$936,096**	**$1,145,000**	**$4,895,000**	**$1,580,000**	**$3,950,000**	**$6,780,000**
	WASTEWATER UTILITY SUBTOTAL:	**$6,321,000**	**$4,702,754**	**$6,910,000**	**$11,210,000**	**$7,150,000**	**$8,955,000**	**$11,140,000**
Rate Model Target >>>		**$7,879,134**	**$7,879,134**	**$6,148,611**	**$7,381,959**	**$12,206,972**	**$9,536,564**	
		2019 Adopted	**2019 Actual**	**2020 Proposed**	**2021 Proposed**	**2022 Proposed**	**2023 Proposed**	**2024 Proposed**
	WATER UTILITY SUBTOTAL:	**$5,600,000**	**$6,877,234**	**$16,485,000**	**$9,819,500**	**$9,206,000**	**$5,390,000**	**$4,475,000**
	WASTEWATER UTILITY SUBTOTAL:	**$6,321,000**	**$4,702,754**	**$6,910,000**	**$11,210,000**	**$7,150,000**	**$8,955,000**	**$11,140,000**
	OVERALL TOTAL	**$11,921,000**	**$11,579,987**	**$23,395,000**	**$21,029,500**	**$16,356,000**	**$14,345,000**	**$15,615,000**
	Rate Study Target (EXCLUDING Citywide Initiatives)	**$11,766,000**	**$11,766,000**	**$11,817,500**	**$12,352,500**	**$13,827,500**	**$13,827,500**	
	Variance	**$155,000**	**($186,013)**	**$11,577,500**	**$8,677,000**	**$2,528,500**	**$517,500**	**$15,615,000**
				$1,577,500 W/O AMI				

Naperville Public Utilities - Water & Wastewater Collection & Pumping Division
FY2020 O&M Budget
12/17/2019

PURCHASED SERVICES	
Account Description	Budget
Architecture & Engineering Services	$150,000
Building & Grounds Maintenance	$25,000
Equipment Maintenance	$27,500
Operational Service	$531,000
Software & Hardware Maintenance	$17,000
Postage & Delivery	$1,000
Rental Fees	$15,000
subtotal	**$766,500**

PURCHASED ITEMS	
Account Description	Budget
Equipment Parts	$111,000
Operating Supplies	$60,000
Electric	$248,486
Natural Gas	$6,250
subtotal	**$425,736**

CUSTOMER REIMBURSEMENT PROGRAM	
Account Description	Budget
Service Roddings/Backflow Devices, Etc.	$225,400
subtotal	**$225,400**

SALARY & BENEFITS	
Account Description	Budget
Salary & Benefits	$1,368,343
subtotal	**$1,368,343**

Overall Total	**$2,785,979**

City of Naperville Sanitary Sewer Customer Survey/Registration Form

This form should be completed by the homeowner and plumber and submitted to DPU-Water

CUSTOMER NAME: _____

ADDRESS OF PROBLEM: _____

DATE AND TIME OF CALL: _____

DISTANCE TO THE MAIN FROM THE:_____ IS _____FEET plus distance inside house to cleanout

DISTANCE TO THE MAIN FROM THE:_____ IS _____FEET plus distance inside house to cleanout

CITY REPRESENTATIVE NAME: _____

Registration for rodding of sewer service line – should be filled out by the plumber

PLUMBING COMPANY: _____PHONE #:_____

PLUMBER ONSITE:_____

OBSTRUCTION OCCURRED AT (FOOTAGE):_____FROM **INSIDE** OR **OUTSIDE** CLEANOUT (CIRCLE ONE)

LOCATION OF BLOCKAGE (CIRCLE): **PRIVATE PROPERTY** **R.O.W**

WAS DEBRIS RODDED/PUSHED ALL THE WAY INTO THE CITY MAIN (CIRCLE ONE)? **YES** **NO**

Customer Response Survey

Please indicate the circumstances under which you hired the above listed plumbing company:

- ☐ Partial Blockage or Intermittent Problems
- ☐ Total Blockage of Sewer Service
- ☐ Planned Maintenance Rodding
- ☐ Other _____

Did your plumber solve the problem? What did they do?

_____

_____

Was the City representative courteous? _____

Was the City representative informative? _____

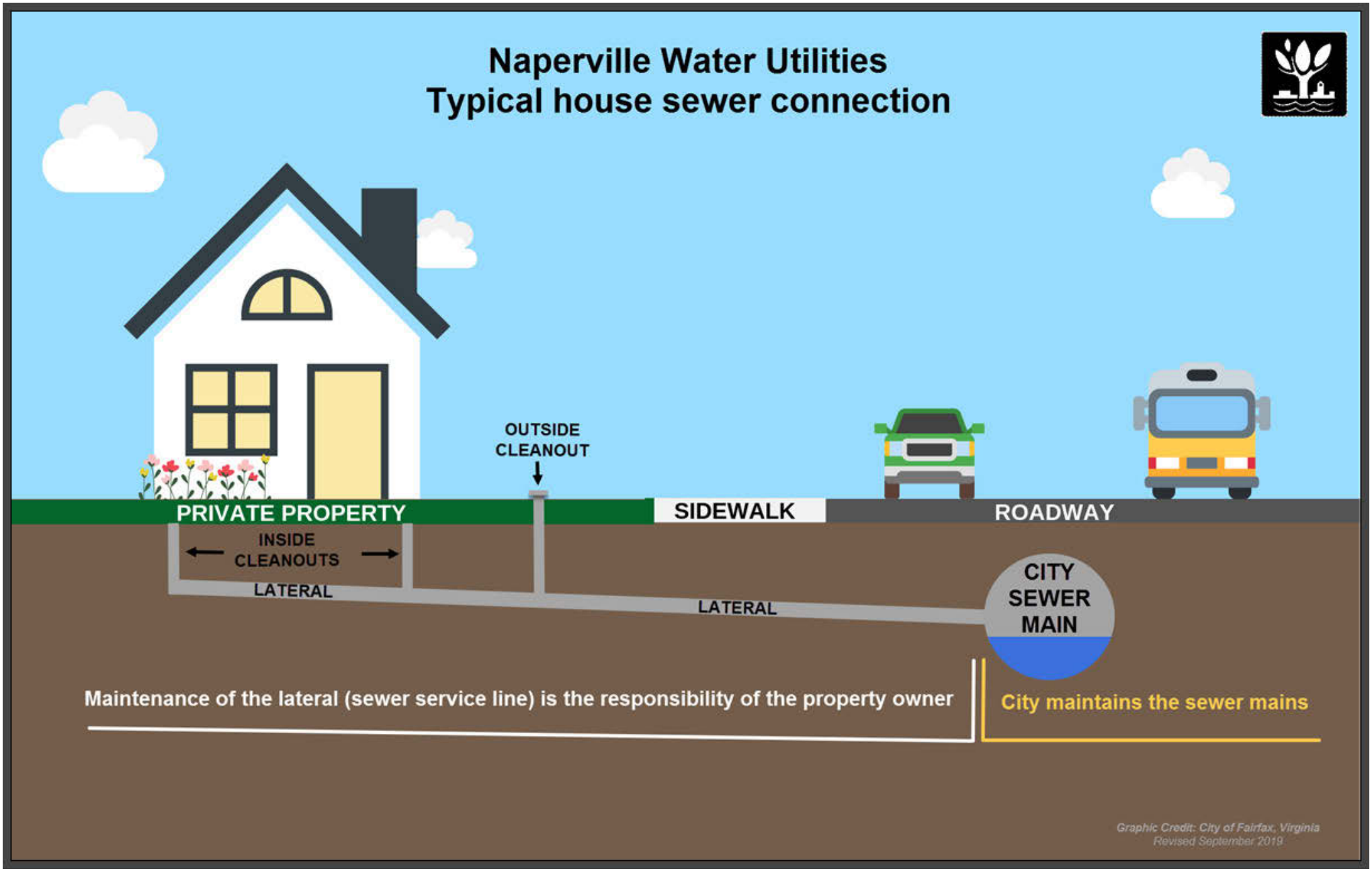
Please mail this entire form **and** a copy of the paid plumbing receipt(s) to:

DEPT. OF PUBLIC UTILITIES – WATER
ATTN: WSC OFFICE PERSONNEL
1200 W OGDEN AVENUE
NAPERVILLE, IL 60563

Our mission at the Department of Public Utilities -Water is to provide the utmost performance and service reliability to all our Naperville customers. Your opinion is valued, we kindly ask that you take a moment to rate our service at:
www.naperville.il.us/watersurvey

For assistance please call (630) 420-6137

Naperville Water Utilities
Typical house sewer connection



CITY OF NAPERVILLE - DEPARTMENT OF PUBLIC UTILITIES – WATER (DPU-W)
SANITARY SEWER SERVICE LINE MAINTENANCE – REPAIR RESPONSIBILITY
(Effective January 1, 1993)

Description	Private Property (House to ROW)	Public Property (ROW)	Comments
Normal/Routine Maintenance 1st rodding in one 12-month period	Property Owner 100% Cost	Property Owner 100% Cost	Must use a qualified plumber with proper tools and rod all the way to city main.
Extra Maintenance 2nd rodding in the same 12-month period	Property Owner 100% Cost	Property Owner 50% Cost City – DPU 50% Cost	Both 1st & 2nd rodding <u>must</u> be investigated by DPU and performed by qualified plumbers using the proper tools. For City to participate in cost sharing, DPU must witness the 2nd rodding.
Excessive Maintenance 3rd rodding (or more) in the same 12-month period	Property Owner 100% Cost	City – DPU 100% Cost	All roddings must be per above. 2nd and additional roddings require DPU to witness. The City may elect to have their own plumber rod the service line.
Repair/Replacement House to ROW (for any reason)	Property Owner 100% Cost		City inspection of new line required before backfilling (TED).
Repair/Replacement Repair and/or replacement of the service line in public ROW when the service line requires rodding more than 2 times in 2 or more consecutive 12-month periods.		City – DPU 100% Cost	All aspects of policy/procedures must have been followed with proper DPU witnessing. The city may rod instead of repair when appropriate.
Repair/Replacement Structural collapse in Public ROW at any time		City – DPU 100% Cost	City – DPU performs all work in ROW. Substantial evidence and DPU witnessing of rodding is required prior to DPU excavating. DPU may not excavate based on a plumber claim that there is a probable collapse in the ROW.
Repair/Replacement Total blockage due to tree roots in which a qualified plumber cannot restore service.		City – DPU 100% Cost	City – DPU performs all work in ROW. Substantial evidence and DPU witnessing of roddings are required prior to DPU excavating. The City may rod instead of repair when appropriate.

GUIDELINES FOR ORDINANCE COMPLIANCE/REIMBURSEMENT PARTICIPATION:

- Department of Public Utilities - Water (DPU-W), should be called at (630)420-6137 to investigate all sanitary sewer back-ups prior to calling plumber for assistance.
- The DPU-W representative will check the city sanitary sewer main and let the customer know how far it is to the main from the sanitary sewer service line and give the customer a handout with a registration form for potential reimbursement.
- The registration form must be completed and indicate the rodding was performed successfully from the cleanout to the main by a qualified plumber. The completed form and a paid receipt accompanying the form should be sent to DPU-W. <u>Improper or incomplete roddings do not count as instances</u>.
- The DPU-W payment(s) or repairs are made per policy and guidelines that are in the right of way (ROW) or easement areas only, not on private property.
- If payment(s) are warranted, they are made to the customer, not the plumber.
- DPU-W is not responsible for the blockages in the ROW caused by inappropriate items flushed or dropped/inserted down the service line (including toys, baby diapers, or construction debris, etc).

Naperville

COMMON QUESTIONS REGARDING THE SANITARY SEWER SERVICE LINE RESPONSIBILITY ORDINANCE/POLICY

The customer is responsible for all normal maintenance of the service line on private property as well as in the city ROW (right-of-way).

QUESTION: What does normal maintenance mean?

ANSWER: Normal maintenance is the removal of materials that are flushed or dropped/inserted down the service line (including toys, baby diapers, etc.), construction debris, and tree roots (that require less than two roddings per year by a qualified plumber that is located in the right-of-way/easement). All problems on private property are the sole responsibility of the customer. If the plumber is unable to restore service and feels the blockage is in the ROW, the customer needs to contact the Department of Public Utilities while the plumber is still present and a representative will be dispatched immediately. If the blockage is determined to be in the ROW and the plumber can't get through, the DPU will determine whether another plumber will be contacted at the City's expense or an excavation will be initiated. The results of this work will dictate whether the customer will be reimbursed for the initial unsuccessful rodding.

The Department of Public Utilities (DPU) will share 50% of the cost with the property owner of an additional right-of-way rodding after the lot owner has paid for one ROW rodding in the same 12 month period.

QUESTION: What are the procedures that must be followed so as to participate in the cost sharing?

ANSWER: The most important and first step is to call DPU's Water Distribution & Collection Division at (630) 420-6137 to have crews investigate the city sanitary sewer mains prior to calling a plumber. This is very important to ensure that the mains are not blocked, where we can let you know how far it is that your plumber needs to rod (to ensure debris is pushed all the way out of the service line into the city main), and that DPU documents the information, as well as a follow-up call is made to ensure everything turned out effectively. Customers will receive an information sheet with a registration form and the distance from the house to the sewer main each time the DPU is contacted to investigate a sewer back up. DPU will respond to each rodding registration after review.

To qualify, the form must be completed, and signed by the customer, the rodding must be done successfully from the cleanout to the sewer main, the blockage was located in the ROW, and a paid receipt must accompany the registration form. Reimbursement of 50% to the customer for the second rodding by an experienced/licensed plumber will

be made only if the rodding is witnessed by a DPU representative and the blockage is determined to be in the ROW, and not caused by "foreign" materials that were flushed down or dropped/inserted down the customer service line, or construction debris. Under policy guidelines, reimbursement will be to the customer not to the plumber.

The DPU will pay 100% of the cost of additional right-of-way roddings in the same 12 month period.

QUESTION: What must the customer do to qualify for DPU to pay for the additional roddings?

ANSWER: The procedures previously mentioned must be followed. To qualify, the form must be completed, and signed by the customer, the rodding must be done successfully from the cleanout to the sewer main, the blockage was located in the ROW, and a paid receipt must accompany the registration form. Reimbursement to the customer for the third (or more) roddings by a qualified plumber will only be made if the rodding is witnessed by a DPU representative and the blockage is determined to be in the public ROW and not caused by "foreign" materials that were flushed down or dropped/inserted down the customer's service line, or construction debris. Reimbursement will be to the customer not to the plumber.

DPU will be responsible for the total cost of repairs to the sanitary service line in ROW where a licensed/experienced plumber is not able to break through the blockage, if there are structural problems with the sanitary service line, or where the service line requires rodding more that two times in two or more consecutive years (per DPU policy).

QUESTION: How do I qualify for DPU to pay for the above-mentioned cost?

ANSWER: The procedures previously mentioned must be followed. If a service line is repaired on private property by a licensed plumber and the customer feels the service line repairs should extend into the ROW or easement, the DPU must be notified, allowed to investigate, and the work must be prior approved to qualify for reimbursement.

Naperville
Department of Public Utilities - Water

RE-ESTABLISHMENT OF FLOODED HOMES -SAFETY AND SANITATION INSTRUCTIONS
(As related to sanitary sewer surcharge)

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1. Wash or flush down walls and floors as soon as the floodwaters recede. **DO NOT BRING CHILDREN INTO THE FLOOD AREA DURING CLEAN-UP.**

2. Be cautious in entering a flooded basement relative to electric outlets and gas lines. The utility companies may have to shut off the electricity and gas line if possible. Do not handle any connected electrical cords or appliances if the current is still on. Do not light a match in an enclosed area where gas could be present. Check all affected pilot lights or burners on gas fired or oil-fired appliances before placing them back in service. If electricity is connected to an appliance, which has had, the motor controls submerged, do not attempt to start it until you have consulted your appliance service company or dealer.

3. While a basement is still flooded, avoid flushing toilets or using other plumbing fixtures whose discharge would increase the hazard or make the basement more difficult to clean.

4. Remove water for all flooded basements by natural drainage or by pumping. Wash or flush down walls and floors if possible during the drainage or pumping process.

5. During the clean-up period of basements or other enclosed areas, provide as much ventilation as possible by opening windows and use of fans if electricity is available.

6. As a final cleanup of walls, floors, cupboards, dishes, etc., use plenty of soap or dishwashing compound. Use warm or hot water if possible. Areas may be disinfected by use of Lysol or chlorine solution. Use 8 tablespoons or ½ cup of Clorox or Roman Cleanser per gallon of water.

7. Discard all bottled goods sealed with crimped caps that were in the flood. Destroy the contents to make certain that no one else will use such bottled goods.

8. Discard all vegetables, such as potatoes, carrots, cabbage, onions and others, which were in contact with the floodwater. Canned fruits and vegetables should be thoroughly washed. Wash the outside of the can with soap and hot water, using a brush around the covers and rubber rings. The cans and jars should then be immersed in chlorinated water for at least 15 minutes using the same strength solution as recommended in # 4 above.

9. Food stored in deep freeze unit where the electricity has been off for more than 72 hours should be examined carefully. If the food has not reached a temperature of 40ºF or above, it could be refrozen and used without endangering health; however, the flavor and texture might be damaged. Food with a temperature of above 40ºF should be discarded.

   Food in a freezer where the door or lid has been submerged in floodwater should be discarded if there is evidence that water has entered the freezer compartment. Any discarded food or vegetables should be placed in covered vermin-proof receptacles until final pick-up or disposal.

10. Clothing, carpets, upholstered furniture toys, bedding, and similar items should be discarded unless they are cleaned and disinfected. Movable objects should be put outdoors to dry and exposure to sunlight. Some salvage agencies or companies are equipped to process contaminated material without hazard to employees or eventual customers. Refer to the yellow pages under "carpet and rug cleaners" for available cleaning companies. Discarded clothing should not be left accessible to unauthorized scavengers pending pick-up. Stores with flood damaged merchandise are required to obtain clearance from either the local health department or the Illinois Department of Agriculture before offering any such goods for sale.

11. After cleaning the basement, the individual should make sure that all clothing and parts of the body, which come in contact with the sewage, are thoroughly washed. Prevent the tracking of sewage into the living quarters of the house.

12. The DuPage County Health Department advises that clothes should be washed in hot water a few times before wearing, and whites washed with bleach will kill any bacteria.

Naperville

CUSTOMER AWARENESS

1. Sanitary Sewer Backups:

Always call the City prior to calling a plumber when you experience a sanitary sewer backup or when you feel that the problem may be caused outside of the home. A City representative will be dispatched to check the main sanitary sewer line at no cost to you. The City representative will advise you and measure the distance from your house to the main sanitary sewer line. This information will be useful to you if you need to call a plumber. If the plumber can't make it all the way to the City main and the blockage is in the right-of-way (parkway, street, or easement) call the City immediately, before the plumber removes his sewer rod from the sanitary sewer service line.

2. Heavy Rainfall Sanitary Sewer Backups:

Call the City at the time you're having a problem so we can check the sanitary sewer system. We need to know when and where these backups occur so we can analyze the area to determine if we can reasonably reduce future occurrences. Storm water, retention/detention basins, catch basins, street flooding concerns should be directed to the Department of Public Works (DPW).

3. When Calling For A Plumber:

There are several choices of plumbers. It's a good idea to get price quotes from more than one plumber so you can compare the rates. Ask the plumber if his work is guaranteed and for how long. Let the plumber know if you have any large trees over your sanitary service line and any history of sanitary sewer backups. If you have a long sanitary sewer service line (100' or more) you need to ask the plumber if his equipment will adequately rod the distance of the sanitary sewer service line (especially if tree roots may be involved). The plumber must rod from the house all the way to the sanitary sewer main to effectively clean the service line (or he'll be back). It is recommended that the plumber use a 4”-6” expandable bit if tree roots are the cause of the backup.

4. Water Meter/Valves:

Valves near the water meter are the private property of the homeowner. These valves will turn off water all over the house. Older homes may have only one valve at the meter. All the piping and valves should be kept in good condition so they can be used in case an emergency turn off is needed. It is a good idea to randomly check for potential water leaks (as identified in #5, high bill concerns paragraph) a couple of times a year. Naperville water meters measure usage by cubic feet, not gallons used. There are approximately 7 1/2 gallons in one cubic foot of water.

5. High Bill Concerns:

A leak in your home may be the cause of the problem. Toilet leaks are the usual cause of a high water consumption bill. You can read your water meter at the end of the day and again first thing in the morning to see if there has been any usage over night. Make sure if you have a water softener that it doesn't regenerate when you are performing this "reading test". You can also see if you have a toilet leak by putting dye or food coloring in the tank of the toilet. Watch if the dye goes into the bowl when it has not been flushed. If it does, then the toilet is leaking. Stopping any leaks will save you money on your utility bill.

6. Water Softener:

Many homes in Naperville have water softeners which were considered necessary due to the hard water condition experienced when our water supply came from the underground wells. Presently Naperville's water supply is 100% Lake Michigan water and has a range of 7 - 9 grains of hardness. For many homeowners this reduced hardness level is adequate without the need for a water softener. If you no longer choose to use the water softener it must be disconnected properly or you may experience reduced water pressure in your home. Unplugging the timer unit is

insufficient to disconnect the water softener. You must also prevent the water from circulating through the machine by putting it on "bypass" and unplug the unit for trial period. After you have tried unsoftened water and if you decide to resume softening you can replug and put the unit back on line. Always keep salt in the brine tank if you decide to keep the water softener operational. If you decide you no longer require additional softening have the softener permanently removed.

7. Downspouts & Sump Pump Discharge Pipes:

Make sure you have adequate piping to divert the rain water away from your house. The discharge pipes should release water at least 10 feet away from the house foundation wall. The slope of the ground where the discharge pipes are located should also divert the water away from the house, without proper drainage your sump pump will just be recycling the water from downspouts that don't adequately discharge water far enough away from the building foundation causing the sump pump to needlessly run and may sometimes not be able to pump fast enough. This could result in flooding in the basement as well as the rainwater going down the sanitary sewer drain and causing others to have back-ups.

8. J.U.L.I.E :

Call J.U.L.I.E (joint utility location information for excavations) at least 48 hours (2 work days) prior to digging in your yard so you don't dig into an electric/phone cable, water/sewer or gas service line. J.U.L.I.E services are free of charge.

9. Electrical Structures:

Maintain a ten 10 foot clearance from the front and five 5 foot clearance from the side of any electric utility structures (i.e., fences, landscaping, etc).

CITY PHONE NUMBERS:

CONCERN	DEPARTMENT	PHONE NUMBER
1. Billing concerns	Finance	420-6059
2. Electrical concerns	Depart of Public Utilities-Electric	420-6187
3. Garbage pick-up	Department of Public Works	420-4190
4. J.U.L.I.E.S	All	800-892-0123
5. Sanitary sewer back-up	Depart of Public Utilities-Water	420-6137
6. Storm water/drainage flooded streets	Depart of Public Works	420-6095
7. Water leaks/concerns	Depart of Public Utilities-Water	420-6137
8. Water meter appt/concerns	Department of Public Utilities-Water	420-6137
9. To file claims	Legal – Claims Adjuster	305-5559

Naperville

Dear Customer,

Every year, some Naperville residents are faced with the inconvenience and expense of sanitary sewer backups that are caused by rainwater/groundwater surcharging the sanitary sewer system. These surcharges are caused by heavy rainfall events. If you had sanitary sewage coming up through your basement floor drain you experienced a sanitary sewer backup. If you had storm water entering your basement through cracks, window wells, doors, or your sump pump couldn't handle the storm water you did not experience a sanitary sewer backup.

The City of Naperville's, Department of Public Utilities-Water is committed to reducing and eliminating the frequency and severity of these sanitary surcharges. We have an ongoing program using city crews, consultant engineers, and contractors to locate and repair the problems. This is a long term and ongoing project. This program includes dye testing, televising of sanitary sewers, building inspections, flow monitoring, dig repairs, lining and sealing of sewers.

The Department of Public Utilities has found that certain areas of the city are more susceptible to reoccurring problems. We are offering you participation in our backflow prevention program. This allows you to have a backflow prevention device of your choice installed in your home and the City will reimburse you the homeowner 75% of the cost. If you have any questions, concerns or need technical assistance you can contact us at (630) 420-6137.

This program does not replace our relentless efforts to prevent all backups due to heavy rainfall events. Installation of a backflow prevention device may give you immediate protection and peace of mind from recurring sanitary sewer backups.

For storm water concerns call (630) 420-6095. If you have a claim to file contact our Legal Department at (630) 305-5559.

Department of Public Utilities-Water
Water Distribution & Collection Division

Naperville

PAYMENT AGREEMENT FOR INSTALLATION OF
SANITARY SERVICE BACKFLOW PREVENTION DEVICE

The Department of Public Utilities-Water recognizes that certain areas of the city are more susceptible to reoccurring sanitary sewer backups due to heavy rainfall surcharges. We are committed to reducing the frequency and severity of these surcharges. We are offering you participation in our backflow prevention program. This allows you to have a backflow prevention device of your choice installed in your home and the City will reimburse you the homeowner 75% of the cost. We are doing this, although we have no direct responsibility to do so, to maximize trouble-free service to all our customers.

The conditions for this transaction are as listed below:

A) Homeowner must obtain (3) written quotes and send copies of the quotes to the Collection & Pumping Supervisor for preauthorization prior to any work beginning. These quotes must include restoration. The City will make only one payment. Once the City has given you authorization you may schedule the work. The City will normally select the lowest quote but reserves the right to reject all quotes should they exceed usual and customary charges for this type of installation.

B) Upon completion of the installation, the Homeowner must submit proof of payment for the installation to the Collection & Pumping Supervisor. Payment will then be made by the City for 75% of the agreed on quotation. This will be paid to the customer. No payment will be made to the plumber. This transaction is between the DPU Wastewater Utility and the customer, not the plumber.

C) The City assumes no responsibility for the selection, installation, maintenance or operation of the backflow prevention device. Any future costs related to maintenance or repair of the device will be paid by the Homeowner.

CUSTOMER NAME_____

ADDRESS_____

PHONE _____

QUOTE PRICE _____ PLUMBER _____

QUOTE PRICE _____ PLUMBER _____

QUOTE PRICE _____ PLUMBER _____

TYPE OF DEVICE_____

CITY'S 75% PAYMENT _____

CONDITIONS/PAYMENT AGREED TO BY:

_____ _____
Customer Signature Date

_____ _____
Collection & Pumping, Supervisor Date

Date Installation Completed _____ Plumber_____

Return to: **Dept. of Public Utilities – Water, Attn: Collection & Pumping Supervisor; 1200 W Ogden Ave, Naperville, IL 60563**

HOLD HARMLESS AGREEMENT FOR INSTALLATION OF SANITARY SERVICE BACKFLOW PREVENTION DEVICE

(Required for program participation)

In consideration for reimbursement by the CITY of costs incurred under the terms of the installation of a backflow prevention device, I the Homeowner, agree to release, waive, discharge and hold harmless the CITY, its officers, agents, servants, representatives and employees from any and all liability, claims, demands, actions, and causes of action whatsoever arising out of or related to any loss, damage, or injury, including death, that may be sustained by me or any of the property owned by me as a result of my participation in the backflow prevention program and the installation of a backflow prevention device. I further understand that my acceptance into the program by the CITY in no way implies liability by the CITY for any injury or property damage sustained by me as a result of any prior or future sanitary sewer backup.

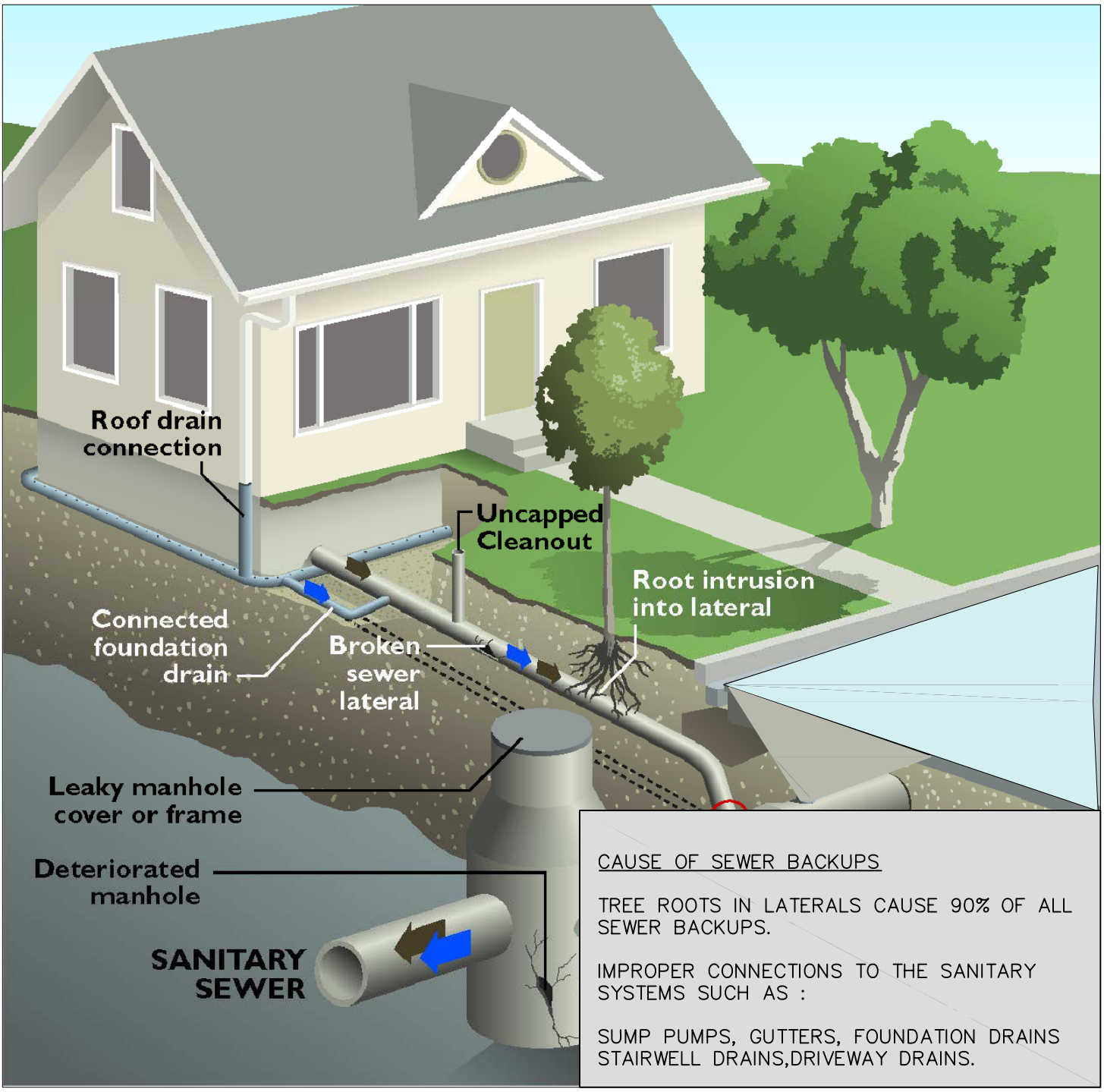
The terms set forth herein shall be in full force and effect during the installation of the device and shall survive thereafter and shall be binding upon my heirs, executors and representatives.

_____ _____

Homeowner Signature Date

Naperville

SANITARY SEWER BACKUPS: CAUSES & PREVENTION



CAUSE OF SEWER BACKUPS

TREE ROOTS IN LATERALS CAUSE 90% OF ALL SEWER BACKUPS.

IMPROPER CONNECTIONS TO THE SANITARY SYSTEMS SUCH AS :

SUMP PUMPS, GUTTERS, FOUNDATION DRAINS STAIRWELL DRAINS,DRIVEWAY DRAINS.

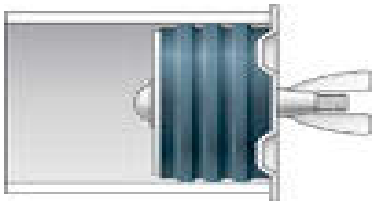
Stand Pipe

A standpipe is an inexpensive alternative to a floor drain plug. When the sewer backs up, the water moves up the pipe. If properly installed, water pressure cannot build up to blow a standpipe out of the floor drain. The system works unless the backup is so deep that it goes over the top of the pipe.

.

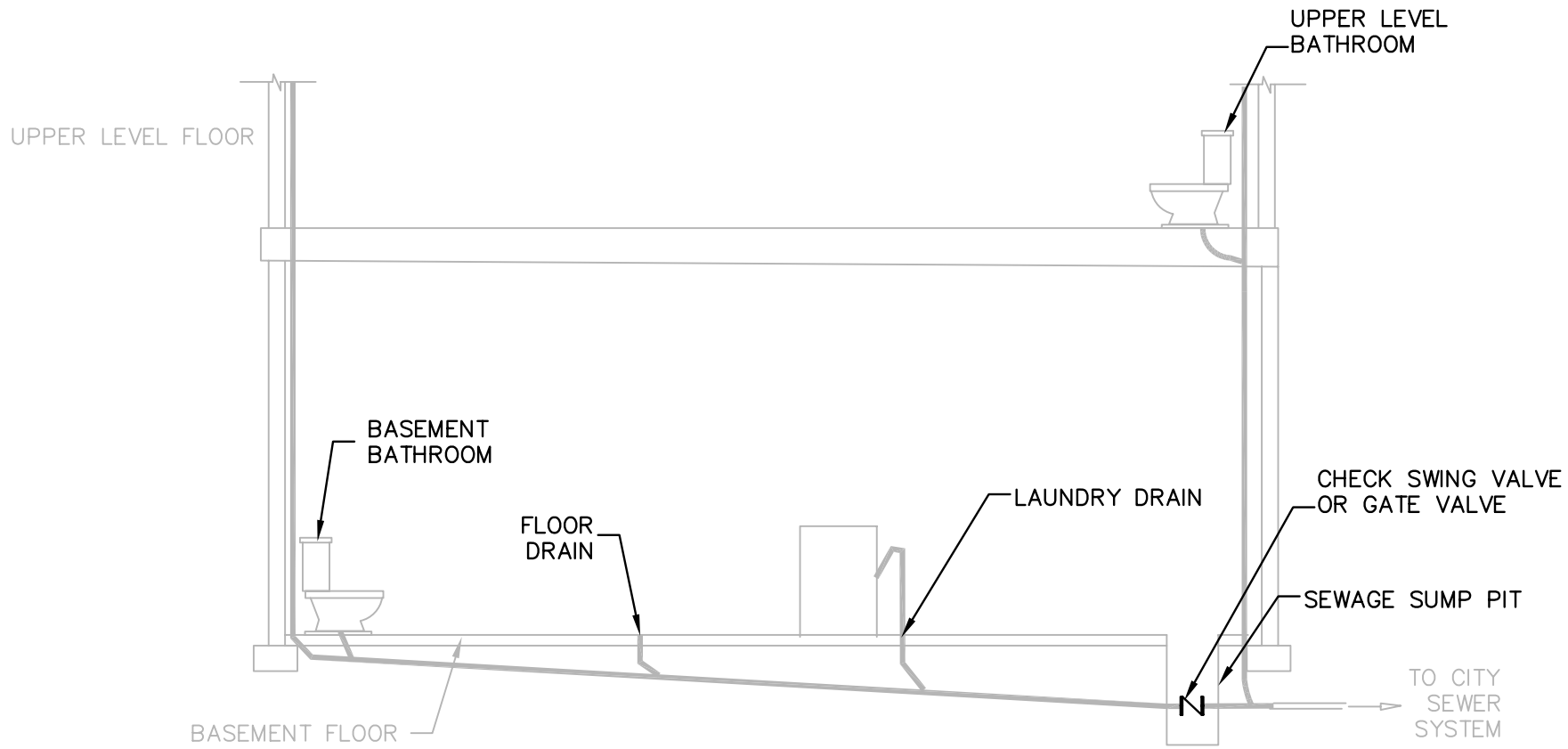
Floor Drain Float Plug

This Plug is an automatic backup valve installed to prohibit sewage backing ups. When the water level is down at (the left), the float hangs free and allows water to drain. As the water rises in the floor drain the float is pushed up into the plug effectively blocking the drain from flooding.



Mechanical Plug

A mechanical plug device for sealing pipeline drains. The plugs are installed mechanically and should only be installed in periods of heavy rains.



BACK FLOW PREVENTION OPTION 1
SWING CHECK VALVE/GATE VALVE -N.T.S.

CHECK VALVES\GATE VALVES:

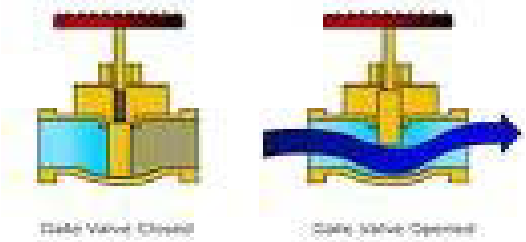
ADVANTAGES

- NOTHING TO REMOVE TO RESTORE USE OF FLOOR DRAIN.
- NO PIPE PROJECTING FROM THE FLOOR DRAIN. (STAND PIPE)

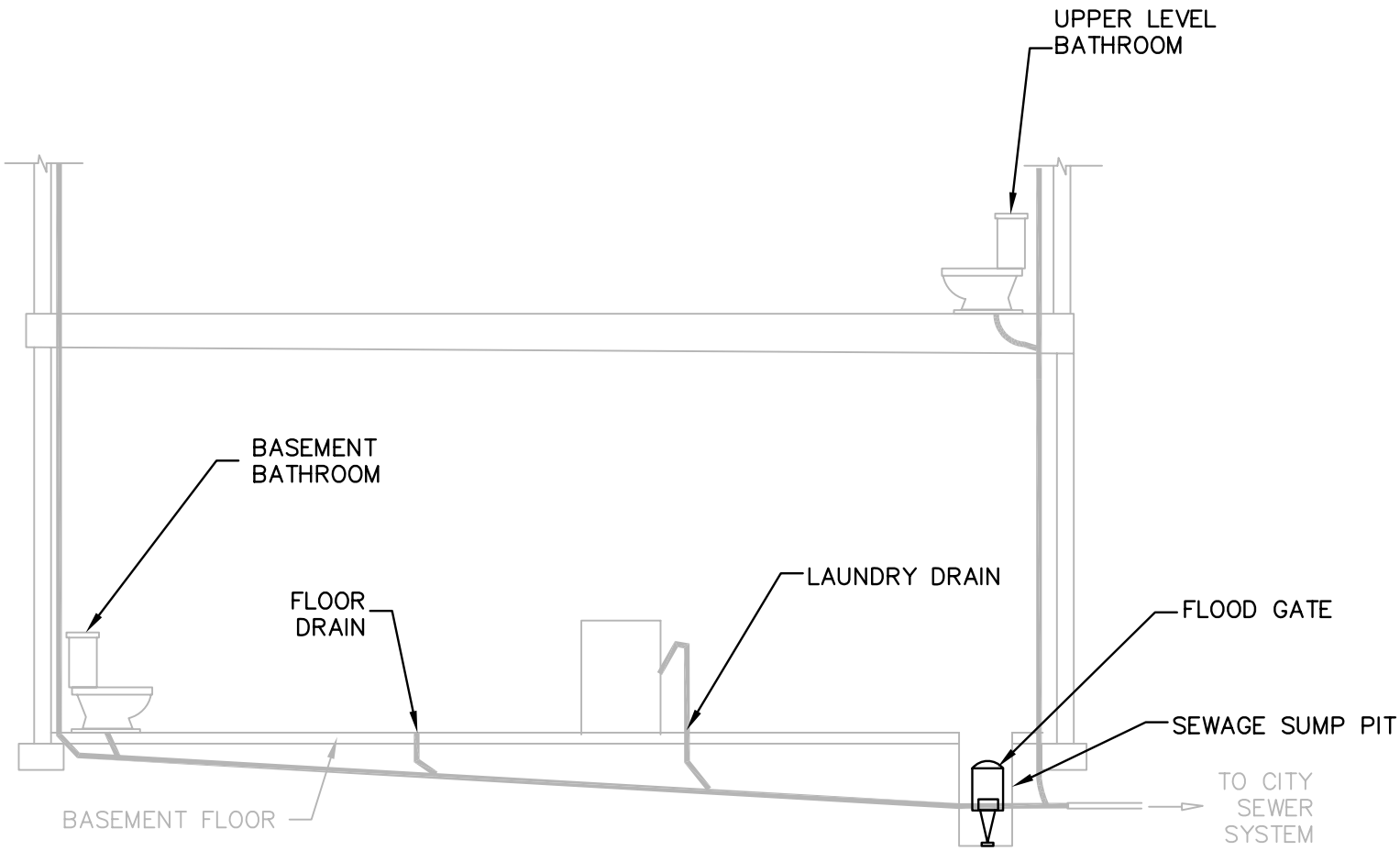
DISADVANTAGES

- NEEDS ANNUAL MAINTENANCE TO OPERATE CORRECTLY AT AN ANNUAL COST.
- HOMEOWNER MUST BE HOME TO OPERATE GATE VALVE.
- CANNOT USE ANY PLUMBING IN THE HOME WHEN VALVE IS CLOSED.

SECTION VIEW OF A SWING CHECK VALVE



SECTION VIEW OF A GATE VALVE



BACK FLOW PREVENTION OPTION 1
FLOOD GATE-N.T.S.

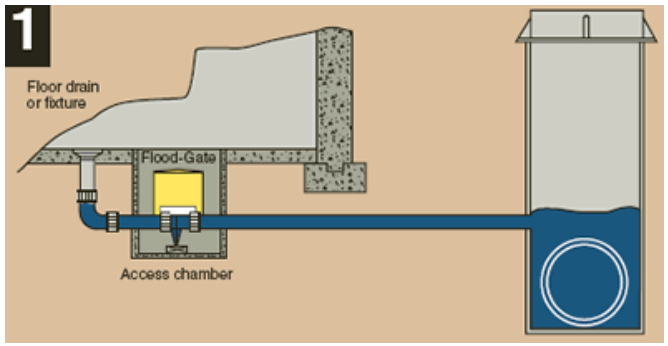
FLOOD GATE:

ADVANTAGES

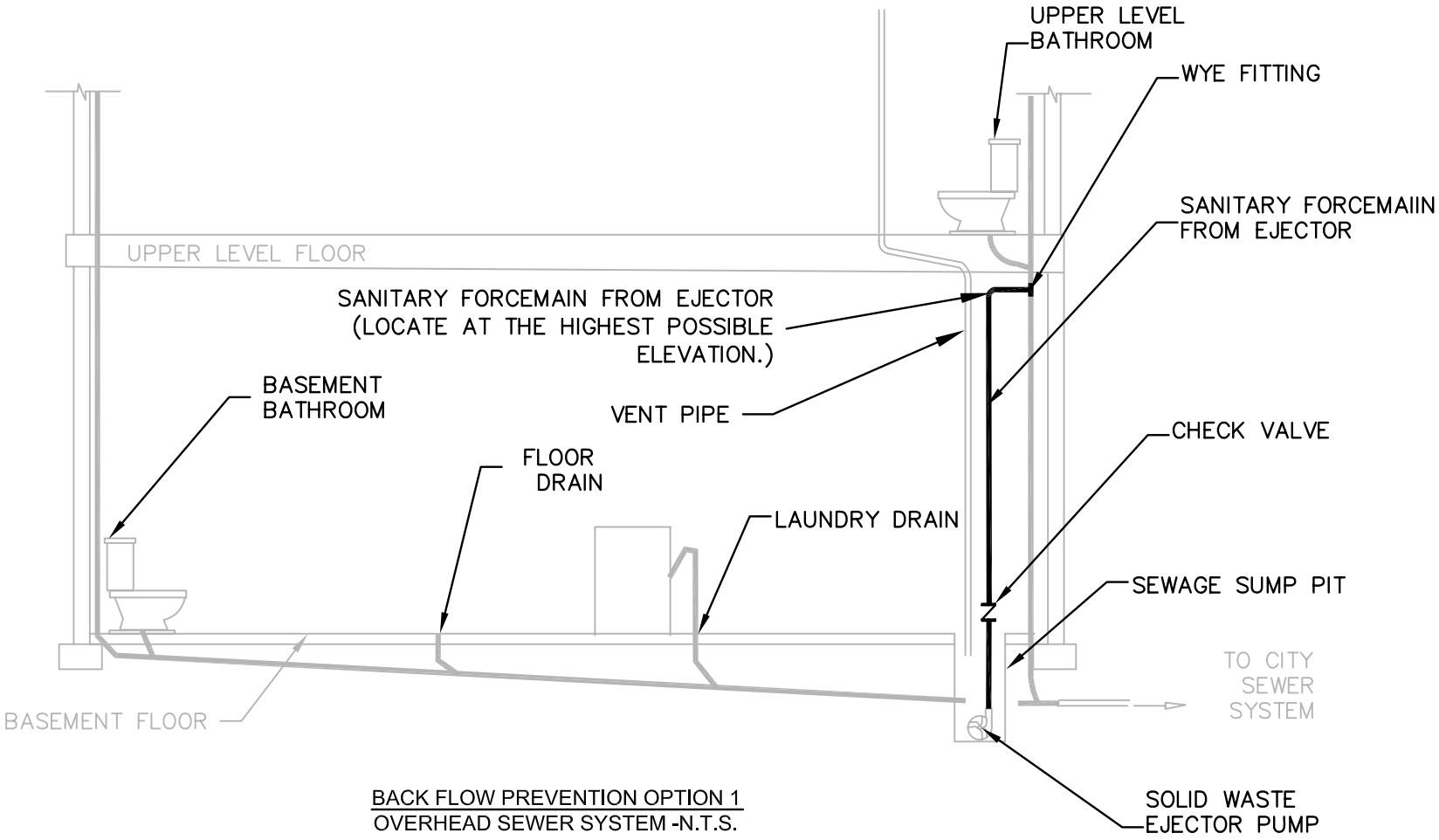
- OPERATES AUTOMATICALLY SO NO ONE HAS TO BE HOME TO OPERATE.
- OPTIONS ARE AVAILABLE TO KNOW WHEN VALVE IS OPEN OR CLOSED.

DISADVANTAGES

- NEEDS ANNUAL MAINTENANCE.
- CANNOT USE ANY PLUMBING IN THE HOME WHEN THE VALVE IS CLOSED.



FLOOD GATE



BACK FLOW PREVENTION OPTION 1
OVERHEAD SEWER SYSTEM -N.T.S.

OVERHEAD SEWER:

ADVANTAGES

- NO ONE HAS TO BE HOME TO OPERATE.
- THE SYSTEM DOES NOT RELY ON A VALVE TO CLOSE TO PREVENT A SEWER BACK UP.
- LOSS OF POWER DOES NOT AFFECT USE OF UPPER LEVEL PLUMBING.

DISADVANTAGES

- SEWAGE EJECTOR PUMP WILL BE INOPERABLE DURING A POWER FAILURE.
- USE OF LOWER LEVEL PLUMBING DURING HEAVY RAIN SHOULD BE MINIMAL.

EJECTOR PUMP AND SUMP PIT

APPENDIX 1 – WATER

1.0 FOREWORD

This Emergency Operating Plan (EOP) was prepared for the Department of Public Utilities – Water (DPU-Water) to provide a logical framework for meeting a variety of emergencies. This plan does not apply to normal day-to-day emergencies and the well-established routine procedures used to confront such emergencies.

The intent of this plan is to provide a functional framework to deal with an emergency in a controlled fashion.

2.0 PLAN MAINTENANCE

The Director of DPU-Water (or designated alternate) shall be responsible for ensuring that necessary changes or updates to this plan are published and distributed.

Revisions to any part of this EOP by the Water Reclamation (SWRC) Division, or the Water Distribution and Collection (WD&C) Division shall be forwarded to the Director.

3.0 DISTRIBUTION LIST

This EOP shall be distributed to the following individuals:

- Darrell Blenniss, Director, DPU-Water & Wastewater
- Amy Ries, Deputy Director, DPU-Water & Wastewater
- Tony Conn, Manager, WD&C
- Kerry Anthenat, D&M Supervisor, WD&C
- David Sloan, Field Supervisor, WD&C
- John Vose, R&E Supervisor, WD&C
- Katy Librizzi, C&P Supervisor, WD&C
- Brett Johnson, Field Supervisor, WD&C
- Joe King, Supervisor, WD&C
- Frank Selvaggi, Field Supervisor, WD&C
- Joe Slevnik, Manager, SWRC
- Pat O'Malley, Project Manager, WD&C
- David Today, Supervisor, SWRC
- Lisa McNames, Regulatory Compliance Manager, SWRC
- Rob Yagoda, Supervisor, SWRC
- Bill Bolster, Supervisor, CEEC
- John Flannery, Safety & Training Instructor
- Eric Hedman, Safety & Training Instructor

These individuals shall be responsible for maintaining their copy of the EOP in an up-to-date fashion as modifications are made. All copies of the EOP shall be kept in a secure, but accessible location to be readily available in the case of an emergency.

4.0 BASIC PLAN

4.1 TRAINING, TESTS AND EXERCISES

This objective of DPU-Water's management strategy during an emergency is to be efficient

and timely in responding to an emergency. A good EOP is the first step in meeting this objective, but the plan by itself does not guarantee preparedness. Performing tabletop and/or field exercises at all levels of DPU-Water's staff is essential to making personnel operationally ready.

Tests (planned as well as "surprised") should be conducted on a regular basis to maintain the readiness of operational procedures, personnel and equipment. Tests can also be used to evaluate the effectiveness of communication between the Command Site (ICP), SWRC Command Center, WD&C Command Center, and the Emergency Operating Plan.

Exercises provide personnel with an opportunity to become thoroughly familiar with procedures, facilities, and systems which will actually be used during an emergency.

4.2 MAINTAINING THE EMERGENCY PLAN

As the need arises this Plan will be updated, This will be done when deficiencies in the Plan are made apparent following training or exercise; when changes occur in the organizational structure and when technological changes render information obsolete. A specific named individual will be responsible for follow-up to ensure updates are performed timely and accurately.

4.3 STRUCTURE AND OR OPERATIONS

4.3.1. Pre-Emergency Period

Training and exercises should be performed during both normal conditions, during periods of a local or national threat, and during wartime. The level of preparedness shall increase during periods of threats or wartime to include at a minimum:

- Review of the City's EOP and Standard Operating Procedures (SOPs)
- Accelerated training of permanent and auxiliary staff
- Inspection of critical facilities by personnel from DPU-Water and the Police Department
- Mobilization of resources

4.3.2. Emergency Period

The emergency period will consist of two phases:

- Alert and respond to site
- Evaluate and determine if situation is a legitimate emergency

The first phase of the emergency period is initiated when DPU-Water personnel are alerted to a specific event, unusual sample results, or other indicators that are evaluated as a potential emergency period. Field staff shall proceed directly to the location of the potential emergency to establish the ICS as necessary and begin to gather data. Personnel located at the ICS shall use the following tabulated list of

SWRC and WD&C individuals, and contact one individual from each division. Personnel shall call the individuals listed starting from highest priority (managers), and proceeding to the lowest priority (field supervisors). The first individual contacted from both SWRC and WD&C shall serve as the supervisory staff to the personnel located at the ICS during this initial phase.

SWRC and WD&C Employee Contact List:

SWRC Division				WD&C Division			
Contact		**Work Phone**	**Cell Phone**	**Contact**		**Work Phone**	**Cell Phone**
Joe Slevnik		630-420-6125	630-780-8438	**Tony Conn**		630-305-5537	630-774-5324
David Today		630-420-4181	630-816-2536	**Kerry Anthenat**		630-420-4123	630-774-4514
Rob Yagoda		630-420-6129	630-514-8283	**David Sloan**		630-305-5263	630-240-4586
Lisa McNames		630-420-6121		**John Vose**		630-420-6741	630-675-0501
				Brett Johnson		630-548-1270	630-774-7780
				Joe King		630-420-6740	630-809-0236
				Frank Selvaggi		630-305-5993	630-774-2114
				Katy Librizzi		630-305-5994	630-200-8244
				Pat O'Malley		603-420-6681	630-768-6693

The second phase of the emergency period is for WD&C and SWRC supervisors to evaluate the information gathered and determine if the situation at hand is a legitimate emergency. If it is determined that the situation definitely is an emergency, WD&C and SWRC supervisory staff shall contact the Director of DPU-Water to determine if the situation is a credible emergency that requires the activation of the EOC. If the EOC is activated, staff at the EOC will take over coordination activities at the ICS. Staff at the ICS shall simultaneously maintain contact with the WD&C and SWRC Command Centers to determine the tasks that need to be completed.

4.3.3. Post-Emergency Period

When staff at the EOC determines that the emergency is over, the post-emergency period shall include the following tasks:

- Placing water service back online
- Restoring any damaged public or private property
- Identifying any residual hazards
- Planning to mitigate future hazards
- Summarizing costs associated with the response and recovery efforts

* * * * *

FIRST PRIORITIES - INITIATE IMMEDIATELY:

1. EVACUATION PLAN FOR SWRC DIVISION AND CEEC FACILITIES

In the event any of the following situations occur, 1) natural disaster, 2) nuclear, military or terrorist attack, or 3) major chemical spill (chlorine bleach or sodium bisulfate); chlorine gas leak, the following steps shall be taken depending on location and type of emergency:

Springbrook Water Reclamation Center (SWRC) and Civil Environmental Engineering Center (CEEC)

1. **Upon receiving notification of a natural or nuclear disaster, all SWRC and CEEC personnel shall be notified and report to the SWRC administration building control room. All people will be accounted for and given further instructions at that time and location.**

   Any chemical spill or release must be reported to the National Response Center (NRC), EPA Region 5 Office and Illinois Emergency Management Agency (IEMA) (notifying the Naperville Fire Department / EMA may satisfy the IEMA notification). These notifications may be for major leaks or releases such as events that require contacting the Naperville Fire Department or another agency for assistance (ref. http://www2.epa.gov/emergency-response/national-response-system).

2. **Upon receiving a report of a major chemical spill or leak which may require site evacuation, all SWRC personnel will be notified to report to the administration building control room or if wind direction requires, to the CEEC building. CEEC shall be notified of the situation status and will be advised of necessary steps to be taken and of changing conditions.**

Water Supply Sites

There are limited amounts of chlorine at these sites but in the event there would be a major release of chlorine, people should move up-wind of the leak and report it to the Naperville Fire Department (911), supervisor and to the IEPA. It may be necessary to block off the road to stop access through the area. You should remain near the site to provide assistance to emergency response units and maintain contact with supervisor for instructions.

EMERGENCY AND ALARM RESPONSE PROCEDURES AND RELATED OVERTIME AUTHORIZATION

Supervisory/management employees shall be contacted in the following order for notification of operational and/or mechanical/electrical problems at the following divisional sites at all times:

Springbrook (Operational Problems)

1. **Wastewater Operations Supervisor**
2. **Wastewater Maintenance Supervisor**
3. **SWRC Water Reclamation Division Manager**
4. **DPU-Water Director**

Water Supply Facilities

1. **Water Supply Supervisor**
2. **WD&C Distribution Section Supervisor**
3. **WD&C Division Manager**
4. **DPU-Water Director**

Remote Pump Stations

For any alarms at remote sanitary sewer pump stations, notify the city dispatcher (X6187 or X 6188) to call out Water Distribution & Collection (WD&C) Division personnel during evening or weekend hours. The callout order is as follows:

1) **WD&C Collection & Pumping Field Supervisor**
2) **WD&C Collection & Pumping Section Supervisor**
3) **WD&C Division Manager**

In those situations when the specified management/supervisor employees cannot be reached on a timely basis, the employee on duty should use his/her own judgement to obtain additional help as is required to adequately handle the situation. In these cases, the employee has the authority to call 1) the standby person (if applicable) or 2) other employee(s) in on an overtime basis as the need justifies.

After obtaining the required assistance, the operator on duty should continue trying to contact the specified management/supervisory personnel. If those management/supervisory personnel are still not readily available, the operator on duty should notify the dispatcher and advise him/her of the situation. The operator on duty should then continue to try to contact the specified management/supervisor personnel on a periodic basis throughout the remainder of his/her shift. If the management/supervisory personnel are still not available, the next shift operator (in case of wastewater operator) should be notified and should continue periodic calls to the specified management/supervisory personnel until one of them is reached and advised of the situation.

The above pertains to operators/personnel in all sections of the division.

1.

NATURAL DISASTER CHECKLIST - WATER & WASTEWATER UTILITIES		
PRE-EMERGENCY	**EMERGENCY**	**POST EMERGENCY**
1. Check the availability of personnel. 2. Ensure that all employees' home phone numbers are updated on a regular basis. 3. Routine check of equipment operation. 4. Check Disaster Plan as to responsibilities and coordinate with other departments. 5. Contact ESDA Office and report the availability of City equipment and personnel. 6. Keep maps of water mains, valves and other utility structures up to date and easily accessible. 7. Establish Resource Center.	1. Provide emergency water and wastewater services as needed. 2. Act as Advisor to Chief Executives on engineering problems. 3. Provide for emergency shut down of all utilities. 4. Provide for continued operation of all utilities. 5. Provide engineering equipment to other services on a priority basis as determined by the officials. 6. Assist with debris clearance. 7. Maintain utilities to critical and essential facilities. 8. Provide sanitation services.	1. Assist with debris clearance. 2. Assign private equipment on a priority basis. 3. Conduct examination of utility structure to determine the extent of damage that has occurred. 4. Make repairs to water and wastewater mains and structures as needed. 5. Restore utilities to critical and essential facilities.

2.

EVACUATION CHECK LIST - WATER & WASTEWATER CHECKLIST		
PRE-EMERGENCY	**EMERGENCY**	**POST EMERGENCY**
1. Check the availability of personnel. 2. Ensure that all employees' home phone numbers are updated on a regular basis. 3. Routine check of equipment operation. 4. Check Disaster Plan as to responsibilities and coordinate with other departments. 5. Contact EMA Office and report the availability of City	1. Provide emergency water and wastewater services as needed. 2. Act as Advisor to Chief Executives on Engineering. 3. Provide for emergency shut down of all utilities. 4. Provide for continued operation of all utilities. 5. Provide engineering equipment to other services on a priority basis as determined by the officials.	1. Assist with debris clearance. 2. Assign private equipment on a priority basis. 3. Conduct examination of utility structure to determine the extent of damage that has occurred. 4. Make repairs to water and wastewater main and structures as needed. 5. Restore utilities to critical and essential facilities.

equipment and personnel. 6. Keep maps of water mains, valves and other utility structures up to date and easily accessible. 7. Establish Resource Center. 8. Identify facilities of terrorism and review safety of buildings.	6. Assist with debris clearance. 7. Maintain utilities to critical and essential facilities. 8. Provide sanitation services. 9. Provide personnel as available to assist with evacuation operation. 10. Ensure that power is provided to areas where shelters are located. 11. Assess terrorist-related damage to mission critical facilities.	6. Provide personnel to support return of evacuees. 7. Restore terrorist-related damage to mission critical utility structures.

3.

NUCLEAR DISASTER CHECKLIST- WATER AND WASTEWATER UTILITIES		
PRE-EMERGENCY	**EMERGENCY**	**POST EMERGENCY**
1. Increased Readiness Phase: a) Cancel all leaves and vacations. b) Check availability of personnel. c) Review emergency plan. d) Brief personnel on their responsibilities during nuclear disaster. 2. Warning Phase: a) Relocate to the EOC (assigned staff only) 3. Establish Resource Center.	1. Continue operations until fallout arrives. 2. Act as Advisor to Chief Executives on engineering services. 3. Provide for shutdown of gas and other utilities to prevent more damage. 4. Provide for emergency water and wastewater services where needed, on priority basis as determined by the Chief Executives. 5. Provide sanitation services.	1. Assist with debris clearance. 2. Assign private equipment on a priority basis. 3. Ensure that water supply system is intact and that water is safe to drink. 4. Assess extent of damage to utility structures. 5. Make repairs to water and wastewater mains and structures as needed. 6. Restore utilities to critical and essential facilities.

4. PRIMARY OBJECTIVES IN THE EVENT OF AN EMERGENCY:

A. Maintain a constant water supply for both human consumption and for fire-fighting operations. In the event of a disruption of service, it is to be restored as soon as possible. Includes critical cooling systems such as hospitals and data centers.

B. Maintain an operational wastewater treatment system.

C. Provide emergency water supply and sewage disposal.

D. Provide initial damage assessment of wells, storage sites, and underground piping systems, and see that necessary repairs are made.

E. Coordinate with local contractors to obtain additional equipment and manpower as needed.

F. Provide engineering services.

G. Conserve quantity of water by establishing water rationing stations and notifying the public as to the location and quantity of emergency water supplies.

H. Turn off sections of damaged mains.

5. MINIMUM STAFFING FOR WINTER WEATHER EMERGENCIES:

WD&C Administration

WD&C Manager
1 Clerical Staff in Office

WD&C Main Break Crew

1 R&E Supervisor or Field Supervisor
3 R&E UT3, or UT4
Dump Truck #757
Dump Truck #025
Vactor #733
Backhoe #770
Loader #761 (at SOC)
Service Truck #719 / Trailer #661

WD&C Snow Removal - Water Service Center

1 WD&M UT1 or UT2
Truck #797 with plow

WD&C Customer Service

1 C&P UT 2, UT3 or UT4
1 WD&M UT1 or UT2
Truck #669
Truck 708

WD&C Lift Stations

1 C&P UT2
1 C&P UT3 or UT4

Truck #731 with plow
Tractor #285 with plow/snow thrower/snow brush

WD&C Water Supply Section

Water Supply Supervisor
1 UT4
Vehicle #725 with plow, #790 with plow or #718 with plow and liftgate

CEEC JULIE

1 CEECM Locator
Truck #756 (Ford F-150)

SWRC Administration

Water Reclamation Manager
1 Administrative Assistant
Vehicle #702

SWRC Laboratory Section

Regulatory Compliance Manager, Chemist, or UT III-Lab
Vehicle #717

SWRC Wastewater Operations Section

Supervisor or Field Supervisor
1 UT4 for 1st Shift
1 UT4 for 2nd Shift
1 UT4 for 3rd Shift
Vehicles #701, #750 (Wheel Loader), #758 (Backhoe),
#785 (4x4 One-Ton Dump with Plow)

SWRC Wastewater Maintenance Section

Supervisor or Field Supervisor
1 UT4 or 1 UT3
Vehicle #791
Vehicle #798

DPU-W Equipment Available for Loan

4X4 Truck #707 (WD&C)
4X4 SUV Ford Escape #703 (CEE/CM)

DPU-WD&C Equipment Available for Snow Removal

(With Operator - Use WDC Snow Plow Callout List)

Backhoe #771 (WD&C)
6-Wheel Dump with plow #753 (WD&C)
6-Wheel Dump with snow plow #730 (WD&C)

ORGANIZATION

The Department of Water and Wastewater Utilities is organized into four divisions:

A. Administration

B. Civil Environmental Engineering and Construction Management

C. Water Distribution and Collection

D. Water Reclamation

(See Appendix III for organization chart)

RESPONSIBILITIES

The personnel making up the Water and Wastewater Utilities Department are responsible for developing procedures to institute Section I.

IV. CONCEPT OF PLANNING AND OPERATIONS

A. PRE-EMERGENCY PERIOD

1. Maintain a state of readiness to cope with any emergency situation, including mitigation.

2. Develop plans and procedures for instituting items listed in Section I.

B. EMERGENCY PERIOD

1. Alert and assemble personnel at a central location.

2. Initiate items in Section I, following priorities given by the Disaster Analysis Team, or other authorities.

3. Break staff into 12-hour shifts and forward list to Utility Dispatch.

4. Fuel vehicles and equipment for snow removal and/or de-icing activities.

5. Make arrangements to shelter staff at critical facilities for prolonged period.

C. RECOVERY PERIOD

Resume normal operations in accordance with Standard Operating Procedures.

V. THE WATER AND WASTEWATER UTILITY'S INTEGRATED EMERGENCY MANAGEMENT SYSTEM.

A. MITIGATION

Activities designed to avoid or prevent emergencies from occurring, and to reduce the

effects of those that are unavoidable.

1. Identify and list items under our control, which could trigger an emergency. Take steps to eliminate or reduce these hazards.

2. Maintain scheduled preventive maintenance on all utility structures.

3. Maintain a strict set of utility construction specifications so that structures are more likely to withstand a disaster, and be better able to respond to the needs placed on them after the emergency.

4. Identify facilities of terrorism.

B. PREPAREDNESS

Planning and training activities designated to save lives and minimize damage by preparing personnel to respond appropriately when an emergency is imminent.

1. Keep maps of water and sewer mains, valves, and other utility structures up to date and easily accessible.

2. Cross-train employees so that more than 1 or 2 key employees are available to perform necessary maintenance and repairs.

3. Establish an evacuation plan to safely remove from operations sites any non-essential personnel. Prepare in advance a telephone listing of any outside service agency, company, or contractor required in the event of an emergency.

4. Maintain on-hand an adequate supply of tools and materials to make emergency repairs.

5. Ensure that utility structures have adequate fire suppression and back-up power sources to minimize downtime.

6. Identify possible sources of temporary water supplies.

7. Establish security for sites against terrorist activity.

8. Remain up to date with ICS training.

C. RESPONSE

Swift and decisive actions that will eliminate or reduce the severity of the incident.

1. Assign staff to Emergency Operating Center duty.

2. Evaluate potential damage to affected sites.

3. Notify and establish communications with outside emergency service organizations (city, county and state).

4. Set up an alternate mode of communications in the event the primary mode is disrupted.

5. Call any outside service agencies, companies or contractors whose service is required.

6. Assure that emergency power is operational in priority areas.

7. Take measures to verify water quality.

8. In the event of a pipe storage tank rupture, locate and close valves to water storage tanks or distribution systems.

9. Evaluate potential terrorist-related damage to pre-determined facilities.

RECOVERY

Activities which continue until all systems return to normal:

1. Perform necessary maintenance repairs to watermains and sanitary sewer lines, utility structures, and machinery to ensure continued delivery of water and wastewater service.

2. Continue to maintain all aspects of the water distribution system to determine what resources are needed where, as situations change.

3. Obtain supplies to replenish parts used in making repairs.

4. Perform necessary terrorist-related repairs to water mains and sanitary sewer lines, and mission critical utility structures to ensure continued delivery of water and wastewater service.

SECONDARY PRIORITIES:

SWRC DIVISION VEHICLES & EQUIPMENT AVAILABLE FOR USE IN AN EMERGENCY:

VEHICLES
To Transport Personnel (# of People)

#702 - Dodge Grand Caravan (6)
#717 - Ford Transit (5)
#791 - Chevrolet 2500 with Crew Cab (5)

TRUCKS W/LIFT GATES

#701 - Ford F250

TRACTORS

#750 - John Deere 744hmh - 8 cu. yd. bucket
#758 - Ford Loader 555C Backhoe
#794 - Case CX80 Tractor

DUMP TRUCKS

#785 - Ford F450 w/Snow Plow

OTHER TRUCKS AVAILABLE

#754 - Ford F250 Pickup w/Snow Plow

RESCUE EQUIPMENT

8 - Full Body Harness (6 SWRC Safety Trailer)
2 - Full Body Harness (SWRC Maintenance Shop)
5 - Full Body Harness for climbing (stored as West Waterworks)
2 - Rescue/Retrieval Tripod & Winch

GENERATORS, PUMPS, & AIR COMPRESSORS

1 - Stanley HP-1 Power Unit w/1-TP08 Trash Pump – 1 - SM22 Sump Pump
1 - Sullair 125Q Rotary Screw Air Compressor
2 - 110/220 Volt Portable Generators
2 - Ingersoll-Rand Air Powered Sump Pumps - 2" Discharge
1 - Miller Trailblazer-welder/generator 7.0 kw
1 - Miller Spectrum 625 Plasma Cutter

CUTTING & WELDING EQUIPMENT

2 - Oxy-Acetylene Cutting Torch
1 - Miller Mig Welder
1 - Miller Plasma Cutter

ATMOSPHERE MONITORING EQUIPMENT

4 - Portable, Personal Atmosphere monitors for Carbon Monoxide, Lower Explosion Limit, Oxygen, Hydrogen Sulfide.

VENTILATION EQUIPMENT

1 - Gas Powered Ventilator Blower
1 - Electric Ventilator Blower
1 - Hi Volume Ventilator

CHLORINE EMERGENCY REPAIR KITS

4 - A-Repair Kits 100/150 lb. Cylinder (Northeast, South, Southeast and Northwest Waterworks)

MISCELLANEOUS ITEMS

Rakes, Shovels, Picks, Hand Tools, Power Tools, etc.

Stormwater Pollution Prevention Plan (SWPPP)

Springbrook Water Reclamation Center
3712 Plainfield/Naperville Road
Naperville, IL. 60564
630-420-6122

SWPPP Contact:

Water Reclamation Division Manager
Joe Slevnik
3712 Plainfield/Naperville Road
Naperville, IL. 60564
630-420-6125

Preparation Date:

01/ 31/17

Facility Information

Name of Facility: Springbrook Water Reclamation Center
Street: 3712 Plainfield/Naperville Road
City: Naperville State: Illinois ZIP Code: 60564
County: Will

Latitude:
1. 41 º 41 ' _56" N (degrees, minutes, seconds)

Longitude:
1. 88 º 09 ' 50" W (degrees, minutes, seconds)

Estimated area of industrial activity at site exposed to stormwater: 75 acres

Discharge Information

Does this facility discharge stormwater into surface waters? ☒ Yes ☐ No

Does this facility discharge stormwater into a municipal storm water conveyance system? Yes but only in stormwater area 1.

Facility Manager:

Name: Joe Slevnik
Address: 3712 Plainfield/Naperville Road
City, State, Zip Code: Naperville, IL. 60564
Telephone Number: 630-420-6125
Email address: slevnikj@naperville.il.us
Fax number: 630-420-4118

Facility Owner:

Name: City of Naperville
Address: 400 E Eagle Street
City, State, Zip Code: Naperville, IL. 60540
Telephone Number: 630-420-6111

SWPPP Contact:

Name: David Today
Telephone number: 630-420-4181
Email address: todayd@naperville.il.us
Fax number: 630-420-4118

Stormwater Pollution Prevention Team

Staff Names and/or Title	Individual Responsibilities
David Today / Operations Supervisor	SWPPP updates, monitoring, implementation, monthly inspections, training
Rob Yagoda / Maintenance Supervisor	Monitoring and inspections, monthly inspections
Tom Greybill / Operations Field Supervisor	Monitoring and inspections, monthly inspections
Greg Olthoff / Maintenance Field Supervisor	Monitoring and inspections, monthly inspections
Carl Christenson / Operations Field Supervisor	Monitoring and inspections, monthly inspections

General Plant Layout

Bulk Chemicals	Associated Pollutants

Sodium Bisulfite	Sodium Bisulfite
Cationic Emulsion Polymer	Cationic Emulsion Polymer
Sodium Hypochlorite	Sodium Hypochlorite
Magnesium Hydroxide	Magnesium Hydroxide
Equipment Oils	Hydrocarbons

Areas of Site Where Potential Spills/Leaks Could Occur

Location	Outfalls
Sodium Bisulfite / Disinfection Building	Tanks have concrete containment area. If concrete containment area fails or there is a major spill during delivery the southeast (Area 4) stormwater detention area could be impacted.
Sodium Hypochlorite / Disinfection Building	Tanks have concrete containment area. If concrete containment area fails or there is a major spill during delivery the southeast (Area 4) stormwater detention area could be impacted.
Magnesium Hydroxide / pH Vault	Tank has an underground concrete containment area. If there would be a major spill during delivery the southwest (Area 1) stormwater discharge area could be impacted.
Cationic Emulsion Polymer / Centrifuge Building	Tank has concrete containment area. If concrete containment area fails or there is a major spill during delivery the southeast (Area 4) stormwater detention area could be impacted.
Cationic Emulsion Polymer / GBT Building	Totes are stored in a concrete containment area. If concrete containment area fails the northwest (Area 2) stormwater detention area could be impacted. Totes hold 280 gallons of product and are delivered at our loading south blower building dock area. If a spill would happened outside the building but not in the loading dock ramp the south (Area 5) stormwater detention area could be impacted. See Other Areas section for more information on our loading dock. Also stormwater areas could be impacted if a spill would occur during the moving of the totes from the delivery area to the GBT building.
Equipment Oils / All buildings and plant areas	There are no large holding tanks of oils. There is less than 5, 55 gallon

	drums of oil that are stored in Administration building garage. If any drums would leak no storm water areas would be impacted. The Administration building floor drain discharges back to our wastewater treatment plant. At times small amounts of oil are transported between onsite buildings. If there would be a leak or spill it would be localized but could impact nearby stormwater areas. Oil is delivered at our south blower building loading dock area. If a spill would happened outside the building but not in the loading dock ramp the south (Area 5) stormwater detention area could be impacted. See Other Areas section for more information on the loading dock.
Fuel Storage / Main building transformer pad.	There are no vehicle fueling areas on our site. Fuel is stored in approved 5 gallon containers and stored in a safety cabinet on the Main building transformer pad. It would be unlikely but if a large spill happen here the southwest (Area 1) stormwater detention area could be impacted. Also the French drain manhole grate to the north of the transformer pad could be impacted.

Spill Management

1. Communicate the hazard
Immediately notify others working in the area and all supervisory personnel of the hazard and if the situation warrants it, evacuate the area. If needed call 911 for help. Be sure to tell the dispatcher which material was spilled and the quantity so that first responders will be ready to address the situation.

Make sure that anyone who is injured or has been contaminated is removed from the immediate area and taken to a safe place. If appropriate decontaminated injured personnel while waiting for medical personnel to arrive. This underscores the importance of workers knowing the proper steps to take for each chemical they work with.

2. Control the spill
This step focuses on ensuring that the spill does not become any worse. If there is a way to stop the spill or minimize the chances of it becoming worse take those actions (such as closing a valve or righting a container that has tipped over). Workers should immediately don appropriate PPE for the chemical and the nature of the hazard.

If possible (and appropriate) shut down any potential sources of heat or ignition. Increase ventilation to the area if that will safely disperse any fumes. If the fumes present a hazard of their own it's usually better

to isolate the area by closing doors after the workplace has been evacuated.

3. Contain the hazard
Once the immediate situation has been addressed take steps to keep the spill from spreading to other areas or contaminating adjacent surfaces. Depending on the material and situation this usually involves confining the spilled material to a small area by using some type of absorbent material. Start spreading those materials around the perimeter of the spill to prevent it from expanding.

You'll want to prevent the spill from spreading to floor drains or other places that may allow the material to flow to the wastewater plant influent. You may need to build a dike to block or direct the material or use a special product such as a spill sock.

If you have to leave the area during this process be sure to block access to the spilled material with caution tape or some other method that will prevent others from coming in contact with it.

4. Clean up the spill and any damage
Collect the material used to contain the spill and dispose of it in the specified manner. If the spill is small, that may be a plastic bag, while larger spills may require plastic pails or drums. In some cases you'll also need to clean/dispose of any equipment such as brooms or dustpans that you used to clean up the material. If what you've gathered qualifies as a hazardous material be sure to label it accordingly and dispose of it as specified by local laws and environmental regulations.

Clean the surfaces that were affected by the spill with the correct material whether that's bleach, a mild detergent, water, or some other material appropriate for the product that was spilled. Instead of rinsing the area after cleaning you may need to use another method such as more absorbent material.

Be sure to wash your hands and any other areas that may have come in contact with the materials thoroughly. If your clothing can be safely decontaminated and cleaned, follow the appropriate steps. Otherwise dispose of the clothing following proper safety procedures.

Stormwater Storage Areas

If a large spill or leak does accrue and could impact stormwater storage/discharge areas the following is a guide to lessen the impact to offsite areas. See "General Plant Layout" for map of stormwater storage/discharge and bulk chemical storage areas. Also see area maps from storage/discharge outlets.

Area 1
Stormwater area 1 receives stormwater from the Administration building, south GBT building, pH structure, south digesters and main employee parking areas. This includes roof drains, paved and unpaved areas around them.

Spill Containment
Follow the instructions that are in the "Spill Management" section of this guide. If the spill is large and cannot be contained to the spill area then the next steps may be necessary.

Place absorbent socks in the path of the spill to stop and collect the spill.

If unsuccessful, contain the spill by using a damming material like dirt to block the spill from leaving the area.

If this is unsuccessful, plug or dam main driveway stormwater outlet culvert so that the spill does not leave our stormwater area. This culvert flows to a municipal stormwater sewer. See map below for area 1 outlet location.

The fire department should be notified for large spills.

Area 2
Stormwater area 2 receives stormwater from the north digester, north GBT building and west blower building areas. This includes roof drains, paved and unpaved areas around them.

Spill Containment
Follow the instructions that are in the “Spill Management” section of this guide. If the spill is large and cannot be contained to the spill area then the next steps may be necessary.

Place absorbent socks in the path of the spill to stop and collect the spill.

If unsuccessful, contain the spill by using a damming material like dirt to block the spill from leaving the area.

If this is unsuccessful, plug or dam stormwater drain outlets so that the spill does not leave our stormwater detention basin. See map below for area 2 outlet location.

The fire department should be notified for large spills.

Area 3
Stormwater area 3 receives stormwater from the aeration tank, secondary clarifiers 3 & 5 and south Grit/RAS building areas. This includes roof drains, paved and unpaved areas around them.

Spill Containment
Follow the instructions that are in the “Spill Management” section of this guide. If the spill is large and cannot be contained to the spill area then the next steps may be necessary.

Place absorbent socks in the path of the spill to stop and collect the spill.

If unsuccessful, contain the spill by using a damming material like dirt to block the spill from leaving the area.

If this is unsuccessful, plug or dam stormwater drain outlet so that the spill does not leave our stormwater detention basin. See map below for area 3 outlet location.

The fire department should be notified for large spills.

Area 4
Stormwater area 4 has open grate manholes along the paved area north of the centrifuge building and the paved areas north and south of the biosolids storage building. The area also receives surface stormwater from the east and west gravel areas around the biosolids storage building. Surface stormwater can also reach area 1 from the east Grit/RAS building, secondary clarifiers 1-2, sandfilter, disinfection building, centrifuge building and paved and unpaved areas around them.

Spill Containment
Follow the instructions that are in the “Spill Management” section of this guide. If the spill is large and cannot be contained to the spill area then the next steps may be necessary.

Place absorbent socks in the path of the spill to stop and collect the spill. Plug or cover any stormwater drains in the area.

If unsuccessful, contain the spill by using a damming material like dirt to block the spill from leaving the area.

If this is unsuccessful, plug or dam stormwater drain outlet so that the spill does not leave our stormwater

detention basin. See map below for area 4 outlet location.

The fire department should be notified for large spills.

Area 5
Stormwater area 5 receives stormwater from entire south treatment plant area. This includes roof drains, paved and unpaved areas around it.

Spill Containment
Follow the instructions that are in the “Spill Management” section of this guide. If the spill is large and cannot be contained to the spill area then the next steps may be necessary.

Place absorbent socks in the path of the spill to stop and collect the spill.

If this is unsuccessful, plug or dam stormwater drain outlet so that the spill does not leave our stormwater detention basin. See map below for area 5 outlet location. Also the French drain manhole grate north of secondary clarifier 7 could be impacted.

The fire department should be notified for large spills.

Other Areas
All the area of lagoon #2 drains north to a drain structure that discharges to our wastewater treatment plant.

South blower loading dock trench drain discharges to the south blower building grease trap and then drains back to our wastewater treatment plant.

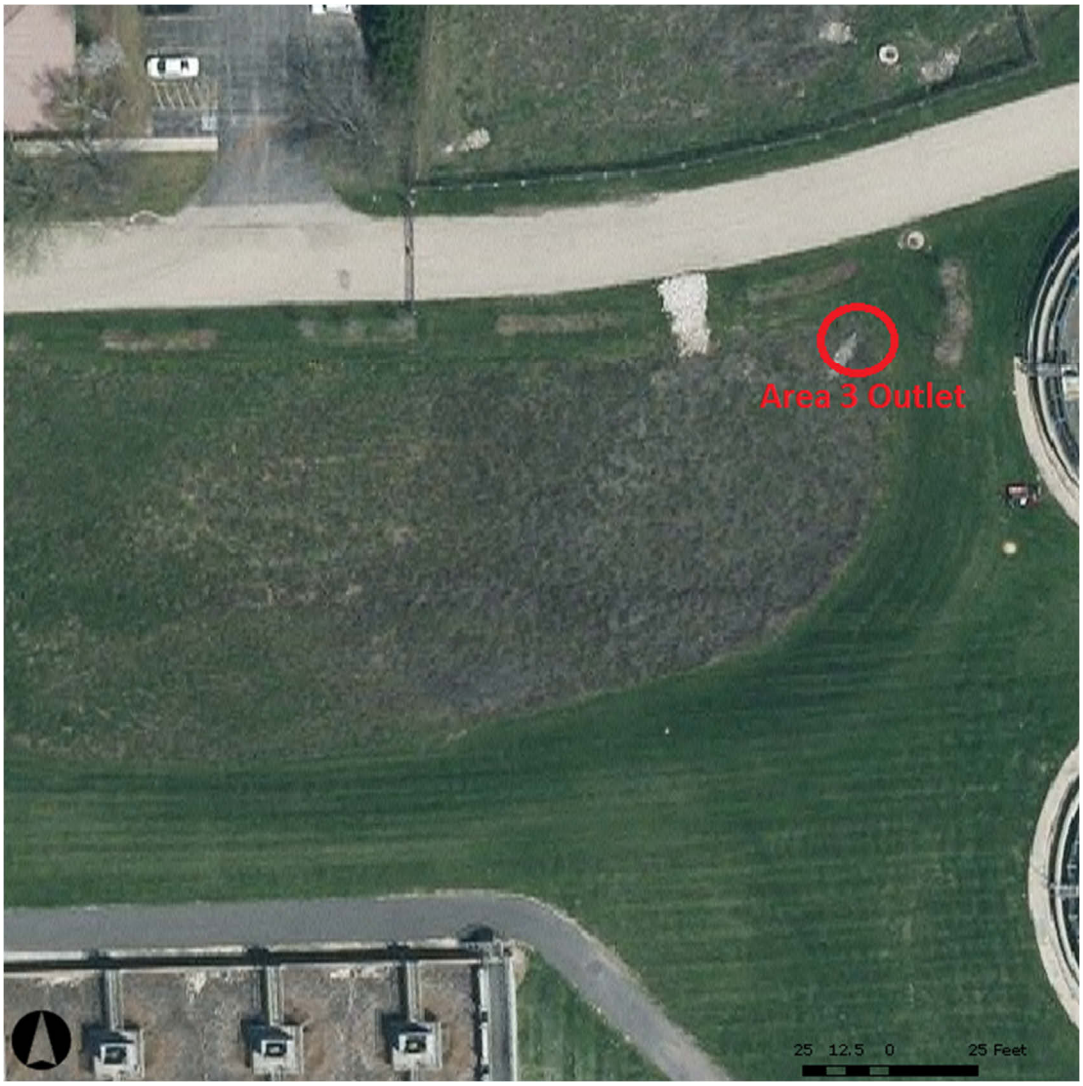
The area around the vehicle storage building drains south to the DuPage River. Surface stormwater can reach the river from the vehicle storage roof drains, paved and unpaved areas around the building. The floor grating manholes that are inside the vehicle storage building drains back to our wastewater treatment plant. The cleaning of vehicles or equipment should never be done outside of this building.

The area around the barscreen building, secondary clarifiers 4 & 6 and raw pump structures drains to two grating manholes that are east and west of the raw pumps 1-2 structure. These drains **are not stormwater drains** but are drains that flow to our wastewater treatment plant influent. These two manhole gratings are the only drains that are approved for <u>outdoor</u> vehicle and equipment cleaning.

Stormwater Discharge Area 1

Stormwater Dentention Area 2

Stormwater Dentention Area 3



Stormwater Dentention Area 4

Stormwater Dentention Area 5

Best Management Practices (BMPs)

Good Housekeeping

- All spills no matter how small will be reported immediately to a Pollution Prevention Team Member.
- Identify and control all on-site sources of chemical/oil leaks/spills to prevent stormwater contamination from areas exposed to precipitation.
- Keep all dumpsters lids closed when not in use.

Preventive Maintenance:

- Clean catch basins when the depth of debris reaches 60% of the sump depth. In addition, the Permittee must keep the debris surface at least 6 inches below the outlet pipe.
- Inspect all equipment and vehicles during monthly site inspections for leaking fluids such as oil, antifreeze, etc. Take leaking equipment and vehicles out of service or prevent leaks from spilling on the ground until repaired.

- Immediately clean up spills and leaks (e.g., using absorbents, vacuuming, etc.) to prevent the discharge of pollutants.

Spill Prevention and Emergency Cleanup:

1. Store all chemical liquids, fluids, and petroleum products, on an impervious surface.
2. Do not store any chemicals, oils or other contaminates outdoors.
3. Prevent precipitation from accumulating in containment areas with a roof or equivalent structure or include a written plan on how it will manage and dispose of accumulated water if a containment area cover is not practical.
4. Locate spill kits within 25 feet of all stationary fueling stations, fuel transfer stations, and mobile fueling units. At a minimum, spill kits shall include:
   Oil absorbents capable of absorbing 15 gallons of fuel.
   A storm drain plug or cover kit.
   A non-water containment boom, a minimum of 10 feet in length with a 12 gallon absorbent capacity.
   A non-metallic shovel.
   Two five-gallon buckets with lids.
5. Use drip pans or equivalent containment measures during all petroleum transfer operations.
6. Locate materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas).
7. Use drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible. Drain fluids from equipment and vehicles prior to on-site storage or disposal.
8. Maintain a spill log that includes the following information for chemical and petroleum spills: date, time, amount, location, and reason for spill; date/time clean-up completed, notifications made and staff involved.

Employee Training

One a year all wastewater operations and maintenance employees will attend training to prevent illegal stormwater discharges from leaving our site. Training will include:

- Reviewing and updating the Stormwater Pollution Prevention Plan.
- Reporting any employee concerns.
- Reviewing
  8.1. An overview of what is in the SWPPP.
  8.2. How employees make a difference in complying with the SWPPP and preventing contamination of stormwater.
  8.3. Spill response procedures, good housekeeping, maintenance requirements, and material management practices.
- How the Permittee will conduct training.
- The frequency/schedule of training. The Permittee shall train employees annually, at a minimum.
- A log of the dates on which specific employees received training.

Inspections and Recordkeeping

Illegal Discharges

During each monthly site inspection, look for signs of illegal discharges, especially during dry weather when stormwater isn't discharging from the site. Each monthly site inspection will include:

- Completing the Industrial Stormwater Monthly Inspection Report and storing the report in the safety file cabinet.
- Reporting any observations made at stormwater area locations associated with industrial activity to see if there was any discharges to waters of the state, or to a storm sewer system that drains to waters of the state.

- Any observations for the presence of floating materials, visible oil sheen, discoloration, turbidity, odor, etc. in the stormwater discharge(s).
- Any observations for the presence of illegal discharges such as process wastewater, chemical spills or equipment oil leaks. If an illegal discharge is discovered we shall eliminate the discharge.
- Reporting any problems with the condition of the stormwater detention areas and there stormwater discharge piping/structure

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List of Significant Spills and Leaks	Completed by:_____ Title:_____ Date:_____

List all spills and leaks (as indicated on Worksheet #2) of toxic or hazardous pollutants that were significant. Significant spills and leaks include but are not limited to, release of oil or hazardous substances in excess of reportable quantities (see chapter 2 of text). Although not required, we suggest you list spills and leaks of non-hazardous materials.

Date (month/day/year)	Location (as indicated on site map)	Description				Response Procedure		Preventive Measure Taken
		Type of Material	Quantity	Source, If Known	Reason for Spill/Leak	Amount of Material Recovered	Material No longer exposed to Storm-water (Yes/No)	

Spill Log	Completed by:_____ Title:_____ Date:_____

List all chemical and petroleum spills and leaks

Date and Time	Location	Description				Response Procedure		Comments
		Amount	Type of Material	Source, If Known	Reason for Spill/Leak	Notifications Made	Staff Involved	

Employee Training	Completed by:_____ Title:_____ Date:_____

Describe the annual training of employees on the SWPPP, addressing spill response, good housekeeping, and material management practices.

Training Topics 1.) LINE WORKERS	Brief Description of Training Program/Materials (e.g., film, newsletter, course)	Schedule for Training (list dates)	Attendees
Spill Prevention and Response			
Good Housekeeping			
Material Management Practices			
2.) P2 TEAM:			
SWPPP Implementation			
Monitoring Procedures			

PRIORITY ACTION CHECKLIST

Industrial Stormwater Monthly Inspection Report

FACILITY NAME:	**INSPECTION TIME:** **DATE:**

WEATHER INFORMATION:

- Description of Weather Conditions (e.g., sunny, cloudy, raining, snowing, etc.):
  _____
  _____
  _____
- Was stormwater (e.g., runoff from rain or snowmelt) flowing at outfalls and/or discharge areas shown on the Site Map during the inspection: ☐ **Yes** ☐ **No** ☐ **Comments:**
  _____
  _____
  _____

I. POTENTIAL POLLUTANT SOURCE AREA INSPECTION AND BEST MANAGEMENT PRACTICES EVALUATION			
SWPPP and Site Map: Have a copy of the SWPPP and site map with you during the inspection so that you can ensure they are current and accurate. Use it as an aide in recording the location of any issues you identify during the inspection. • Is the Site Map current and accurate? • Is the SWPPP inventory of activities, materials and products current? Any new potential pollutant sources must be added to the map and reflected in the *SWPPP Facility Assessment & Tables 2, 2A, 3 and 5.*	**Yes**	**No**	**Findings and Remedial Action Documentation:** Describe any findings below and the schedule for remedial action completion including the date initiated and date completed or expected to be completed.

PRIORITY ACTION CHECKLIST

Vehicle/Equipment Areas: ***Equipment cleaning: Check NA if not performed on-site. Skip section.*** **Is equipment washed and/or cleaned only in designated areas?** • Observe washing: Is all wash water captured and properly disposed of? ***Equipment maintenance:*** • Are maintenance tools, equipment and materials stored under shelter, elevated and covered? • Are all drums and containers of fluids stored with proper cover and containment? • Are exteriors of containers kept outside free of deposits? • Are any vehicles and/or equipment leaking fluids? Identify leaking equipment. • Is there evidence of leaks or spills since last inspection? Identify and address. • **Are materials, equipment, and activities located so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas)?** •	**Yes**	**No**	**NA**	**Findings and Remedial Action Documentation:**
Add any additional site-specific BMPs: _____ _____ _____ _____ _____	**Yes**	**No**	**NA**	**Findings and Remedial Action Documentation:**

I. POTENTIAL POLLUTANT SOURCE AREA INSPECTION AND BEST MANAGEMENT PRACTICES EVALUATION

PRIORITY ACTION CHECKLIST

Good Housekeeping BMPs:	**Yes**	**No**	**NA**	**Findings and Remedial Action Documentation:**
1. Are paved surfaces free of accumulated dust/sediment and debris? • Are there areas of erosion or sediment/dust sources that discharge to storm drains? 2. Are all waste receptacles located outdoors: • In good condition? • Not leaking contaminants? • Closed when is not being accessed? • External surfaces and area free of excessive contaminant buildup? 3. Are the following areas free of accumulated dust/sediment, debris, contaminants, and/or spills/leaks of fluids? • External dock areas • Pallet, tank and drum storage areas • Maintenance shop(s) • Other areas of industrial activity: _____ _____ _____ _____ _____ _____ _____ _____				
Spill Response and Equipment: Are spill kits available? Do the spill kits contain all the permit required items? • Oil absorbents capable of absorbing 15 gallons of fuel. • A storm drain plug or cover kit. • A non-water containment boom, a minimum of 10 feet in length with a 12 gallon absorbent capacity. • A non-metallic shovel. • Two five-gallon buckets with lids. **Are contaminated absorbent materials properly disposed of?**	**Yes**	**No**	**NA**	**Findings and Remedial Action Documentation:**
I. POTENTIAL POLLUTANT SOURCE AREA INSPECTION AND BEST MANAGEMENT PRACTICES EVALUATION				
General Material Storage Areas: • Are garbage metal bins covered?	**Yes**	**No**	**NA**	**Findings and Remedial Action Documentation:**

PRIORITY ACTION CHECKLIST

Stormwater BMPs and Treatment Structures: Visually inspect all stormwater BMPs and treatment structures devices, discharge areas infiltration and outfalls shown on the Site Map. • Are BMPs and treatment structures in good repair and operational? • Are BMPs and treatment structures free from debris buildup that may impair function? • The permit requires Permittees to clean catch basins when the depth of debris reaches 60% of the sump depth. In addition, the Permittee must keep the debris surface at least 6 inches below the outlet pipe. Based on this, do catch basins need to be cleaned? • Are berms, curbing or other methods used to divert and direct discharges adequate and in good condition?	**Yes**	**No**	**NA**	**Findings and Remedial Action Documentation:**
Observation of Stormwater Discharges: • Is the discharge free of floating materials, visible oil sheen, discoloration, turbidity, odor, foam or any other signs of contamination? • Water from washing vehicles or equipment, steam cleaning and/or pressure washing is considered process wastewater and is not allowed to comingle with stormwater or enter storm drains. Is process water comingling with stormwater or entering storm drains? • Illegal discharges include domestic wastewater, noncontact cooling water, or process wastewater (including leachate). Were any illegal discharges observed during the inspection?	**Yes**	**No**	**NA**	**Findings and Remedial Action Documentation:**

PRIORITY ACTION CHECKLIST

II. CORRECTIVE ACTION AND SWPPP MODIFICATIONS DESCRIPTIONS: Additional space to describe inspection findings and corrective actions if needed. Provide brief explanation of the general location and the rationale for the additional or different BMPs.

III. CERTIFICATION STATEMENTS AND SIGNATURES:

GUIDANCE INFORMATION

ORGANIZATION

Primary Agency:

Department of Public Utilities- Water/Wastewater

Support Agencies:

City of Naperville
Fire/Police/Ambulance
911

City of Naperville
Emergency Management Agency
630-420-6009 - Pager: 630-314-8343

DuPage County - Office of Emergency Management
630-682-7207

Will County - Office of Emergency Management
815-740-0911

Illinois Emergency Management Agency*
800-782-7860

National Emergency Response Center*
800-424-8802

***These agencies to be called in accordance with Section II Emergency Action Checklist.**

GUIDANCE INFORMATION

Direction and Control:

The line of succession for the individual responsible for the operation of the annex:

DEPARTMENT OF PUBLIC UTILITIES

WATER & WASTEWATER UTILITY

CHAIN OF COMMAND

		Mobile #
1.	**Darrell Blenniss** Director	630-423 1048
2.	**Amy Ries,** P.E. Deputy Director	630-774-0511
3.	**Tony Conn** Manager Water Distribution & Collection	630-774-5324
4.	**Joe Slevnik** Manager Water Reclamation	630-780-8438

EMERGENCY PHONE NUMBERS & FACILITY EMERGENCY COORDINATORS:

WSR DIVISION	CONTACT	OFFICE		CELL
SWRC – Water Reclamation Manager	Joe Slevnik	630-420-6125		630-780-8438
SWRC - Wastewater Ops.	David Today	630-420-4181		630-816-2536
SWRC – Wastewater Maint.	Robert Yagoda	630-420-6129		630-514-8283
SWRC – Regulatory Mgr	Lisa McNames	630-420-6121		
Safety Training Instructor	Eric Hedman	TBD		TBD
Safety Training Instructor	John Flannery	630-305-5215		630-461-1088
Emergency Mgt. Coordinator	Dan Nelson	630-420-6009		630-774-4074

Division Employee Address/Telephone Directory:

GUIDANCE INFORMATION

Water Reclamation Division (SWRC)
- Springbrook -
(3712 Naperville/Plainfield Rd)

Employee Name & Title				
Christensen, Carl Wastewater Operations Field Supervisor				
Decker, Kelly Administrative Assistant				
Flaar, Richard Utility Technician IV				
Frantzen, Brent Utility Technician IV				
Goerich, Jr., William Utility Technician III				
Goldsmith, Daniel Utility Technician IV				
Greybill, Thomas Wastewater Operation Field Supervisor				
Steve Guistolise Utility Technician III				
Holzkopf, Robert Utility Technician IV				
Johnson, Jeff Utility Technician IV				
McNames, Lisa Regulatory Compliance Manager				
Nier, Jeffrey Utility Technician IV				
Olivo, Salvatore Utility Technician III				
Olthoff, Greg Wastewater Maintenance Field Supervisor				
Powers, William Utility Technician IV				
Schultz, Harold Utility Technician III				
Slevnik, Joseph Water Reclamation Manager				
Employee Name & Title				
Szok, Carter Utility Technician IV				
Thiel, Jill Chemist				
Today, David				

GUIDANCE INFORMATION

Operations Supervisor – Wastewater				
Walton, Mark Utility Technician IV				
Wrigley, Amy Technical Specialist				
Yagoda, Robert Wastewater Maintenance Supervisor				

GUIDANCE INFORMATION

Water Distribution & Collection Division (WD&C)

- Water Service Center –
(1200 W. Ogden Avenue)

Employee Name & Title				
Abel, Jeremy Utility Technician III				
Alvarez, Aaron Utility Technician III				
Albright, Lori Engineering Technician				
Alvarado, Martin Utility Technician III				
Antich, Jamie Utility Technician IV				
Anthenat, Kerry Supervisor – D&M				
Brue, Terald Utility Technician II				
Chilicki, Keith Utility Technician III				
Conn, Tony Division Manager				
Daggett, Brent Utility Technician II				
Davila-Nuno, Yvette Customer Service Representative				
Lopez, Luke Utility Technician III				
Rafacz, Dariusz Utility Technician III				
Johnson, Brett Field Supervisor – R&E				
Keller, Angelica Utility Specialist				
King, Joseph Water Supply Supervisor				
Kovacs, Peter Utility Technician IV				
Lawrentz, James Utility Technician III				
Lenert, James Utility Technician I				
Lesac, James Utility TechnicianI				
Librizzi, Katy Supervisor – C&P				
Young, Sean Utility Technician IV				

GUIDANCE INFORMATION

Employee Name & Title				
McQuen, Bob Utility Technician II				
Myers, Chris Utility Technician IV				
Nerison, Max Utility Technician III				
Nolan, Brad Utility Technician II				
O'Malley, Joe Utility Technician II				
O"Malley, Patrick Project Manager				
Orin, Josh Utility Technician IV				
Pasillas, Israel Utility Technician I				
Young, Chad Utility Technician I				
Griessler, Joann Administrative Assistant				
Nicholas, Micky Utility Technician I				
Ripsky, Jarett Utility Technician III				
Schlueter, Dave Utility Technician IV				
Schlueter, Marge Administrative Assist II				
Selvaggi, Frank Field Supervisor – C&P				
Saris,Tom Utility Technician I				
Sloan, Dave Field Supervisor – D&M				
Sloan, Timothy Utility Technician III				
Subat, Steven Utility Technician II				
Thome, Wally Utility Technician II				
Tinajero, Dino Utility Technician II				
Vose, John Supervisor – R&E				
Waters, Mike Utility Technician IV				

GUIDANCE INFORMATION

Civil Environmental Engineering & Construction Mgt. Division (CEE/CM)

(3612 Plainfield/Naperville Rd.)

Employee Name & Title				
Bolster, Bill Utility Inspection Supervisor				
Garcia, Rick Utility Technician II				
Xi, Jason Sr. Civil Environmental Engineer				
Lesac, Dave Utility Technician II				
Murphy, Kristina Civil Environmental Engineer				
O'Loughlin, Monica Financial Engineering Specialist				
Ries, Amy Deputy Director/ Engineering Manager				
Splitt, Doug GIS Specialist				
Strait, Josh Sr. Civil Environmental Engineer				
Villalobos, Gerardo Utility Specialist				
Wallace, Gary Utility Technician II				

GUIDANCE INFORMATION

SWRC EMERGENCY VENDOR LISTING:

Advanced Automation & Controls **780 Ridgeview Drive** **McHenry, IL 60050** **815/578-0655** **24 hour contact; Paul 815/693-8914**	**SCADA/Process Controls**
A-Keveloh Plumbing, Inc. **6804 Hobson Valley Dr., Unit 120** **Woodridge, IL 60517** **630/963-0433**	**Plumbing**
Alexander Chemical Company **1901 Butterfield Rd. Suite 120** **Downers Grove, IL 60515** **800/445-9458**	**Chlorine cylinders and emergency response (supplier to Hawkins Inc.)**
Alliance Fence **1900 S. Frontage Rd.** **Joliet, IL 60436** **815/741-3768**	**Temporary fence**
Allied Garage Door, Inc. **P.O. Box 817** **Lombard, IL 60148** **800/660-1877**	**Man-door, garage doors, & gates**
Andritz Separation Inc. **1010 Commercial Blvd. South** **Arlington, TX 76001** **817/465-5611**	**Centrifuge**
Artlip & Sons, Inc. **230 South Broadway** **Aurora, IL 60505** **630/896-1560**	**HVAC**
Aurora Wire & Fixture, Inc. **P.O. Box 1268** **Aurora, IL 60507** **630/859-8777**	**Electrical field work**
Automatic Control Services **931 W. 75th St., Suite 137, PMB 214** **Naperville, IL 60565** **630/357-1780**	**SCADA**
Bennett Door Service, Inc. **320 S. Lombard Rd.** **Addison, IL 60101** **800/558-8229**	**Man-doors & garage doors**

GUIDANCE INFORMATION

Busy Bee Board Up Service & Glass **27 N. Wacker Dr. Suite 412** **Chicago, IL 60606** **773/501-7705**	**Board up service**
Centrisys **9586 58th Place** **Kenosha, WI 53144** **262/654-6006**	**Centrifuge repair**
Classic Fence **1822 Route 30** **Oswego, IL 60543** **630-551-3400**	**Fence**
Cla-Val **Delete Elgin information and add;** **Cla-Val Naperville/Chicago, Illinois office** **331/814-3936** **Dallas office; 214/388-8493**	**Cla-Val equipment (Water Supply)** **(See Dorner Company)**
Clear 20 Inc. **1955 Raymond Rd.** **Suite 110** **Northbrook, IL 60062** **847/498-9808**	**Magnesium Hydroxide**
Columbia Pipe and Supply **544 South Lake Street** **Aurora, IL 60506** **888/361-4500**	**Pipe, valves, fittings**
Continental Electrical Construction Co. **1811 High Grove Lane, Suite 191** **Naperville, IL 60540** **630/355-4500**	**Electrical field work**
Create Cut Invent **5403 Patton Drive Suite #220** **Lisle, IL 60532** **630/258-3028**	**Welding & Fabricating**
Custom Welding **475 River Road** **Naperville, IL 60540** **630/355-3696**	**Welding & Fabricating**
Dahme Mechanical Industries, Inc. **610 S. Arthur Ave.** **Arlington Heights, IL 60005** **847/253-0341**	**General contractor**
DORNER COMPANY **N61 W23043 Silver Spring Drive** **PO Box 189**	**Valves, Actuators, Cla-val**

GUIDANCE INFORMATION

Sussex, WI 53089 **262/932.2100**	
Dreisilker Electric Motors **325 Roosevelt Road** **Glen Ellyn, IL 60137** **630/469-7510**	**Electric motor repairs**
Drydon Equipment Corp. **2035 S. Arlington Heights Rd.** **Suite 110** **Arlington Heights, IL 60005** **847/228-7878**	**Poly & chemical feed, & Ph pump**
EESCO, *a Division of WESCO Distribution, Inc.* **2401 INTERNATIONALE PKWY** **WOODRIDGE, IL 60517** **630/513-8135**	**Westinghouse, EATON, Allen-Bradley**
Fullmer Locksmith Service, Inc. **8611 W. Cermak Rd.** **North Riverside, IL 60546** **708/442-0300**	**Locks & Keys**
Gasvoda and Associates, Inc. **1530 Huntington Drive** **Calumet City, IL 60409** **708/891-4400**	**Repair parts & service**
Gexpro **2235 Corporate Ln.** **Naperville, IL 60563** **630/718-6500** **800/243-2124**	**Motors & electrical**
Grundfos **3905 Enterprise Court** **Aurora, IL 60504** **913/961-0813**	**GBT, RAS & Grit pump parts & service** **Water Supply pumps, parts & service**
Hawkins, Inc. **32040 South Route 45** **Peotone, IL 60468** **708/258-3797**	**Chlorine cylinders and emergency response**
Hoffman Air & Filtration **129 West Official Road** **Addison, IL 60101** **630/543-6604** **630/832-8864**	**SBB Hoffman Blowers**
Hydroaire Service Inc. **1126 W. 40th St.** **Chicago, IL 60609** **773/890-9300**	**Pump parts & service**

GUIDANCE INFORMATION

IESCO Inc. **5235 W. 65th St.** **Unit B** **Bedford Park, IL 60638** **708/594-1250**	**Electrical motor repairs**
Illinois Pump Repairs, Inc. **301 Amendodge Drive** **Shorewood, IL 60431** **815/730-9550**	**Pump parts & service**
Joliet Equipment Corp. **Box 114, Doris Avenue at** **Chicago Street** **Joliet, IL 60434** **815/727-6606**	**Electrical motor repairs**
R J Kuhn **585A Rt. 31** **Oswego, IL 60543** **630/554-3336**	**Plumbing**
LaGrange Crane Service, Inc. **6180 River Rd.** **Hodgkins, IL 60525** **708/354-3510**	**Large crane rental**
Royal Crane Service **3950 W. 155 St.** **Markham, IL. 60428**	
Nichols Crane Rental Company, Inc. **16519 Cherry Creek Ct.** **Joliet, IL. 60433** **815/478-9800**	
LAI, Ltd. **5400 Newport Drive, Suite #10** **Rolling Meadows, IL 60008** **847/392-0990**	**Wastewater supplies (middle man)** **Foxboro, Rotork**
LAYNE | **721 W. Illinois Ave.** **Aurora, Illinois 60506** **630/897.6941**	**Deep well and high capacity pumps**
Lightnin **2002 Bloomingdale Road** **Glendale Heights, IL 60139** **630/924-1208**	**Aerator mechanical service**
Malcor Roofing Company **1793 Commerce Dr.**	**Roofing**

GUIDANCE INFORMATION

Montgomery, IL 60538 **630/896-6479**	
Maxcor Inc. **1331 E. Dunslow Ln.** **Lockport, IL 60441** **815/838-4370**	**Water storage tank renovation**
Wm. F. Meyer Co. **P.O. Box 37** **Aurora, IL 60507** **630/851-4441**	**Plumbing supplies**
Motion Industries **1451 Aucutt Rd.** **Montgomery, IL 60538** **630/897-8652**	**Electrical motor repairs**
Napco Steel, Inc. **1800 Arthur Drive** **West Chicago, IL 60185** **630/293-1900**	**Metal supplier**
Northern Illinois Steel Supply Co. **24005 Nothern Illinois Drive** **Channahon, IL. 60410** **815-467-9000**	
Naperville Construction **P.O. Box 5003** **Dept. #101** **Oak Brook, IL 60523** **630/664-1134**	**Temporary fencing**
National Lift Truck, Inc. **3333 Mt. Prospect Road** **Franklin Park, IL 60131** **630/782-1000**	**Small crane, lift rental**
Northern Illinois Steel **24005 S. Northern Illinois Dr.** **Channahon, IL 60410** **815/467-9000**	**Metal & steel suppliers**
Olsson Roofing Company, Inc. **740 South Lake Street** **Aurora, IL 60506** **630/892-0449**	**Roofing**
Paramont EO **1000 Davey Road** **Unit #100** **Woodridge, IL 60517** **708/345-0000**	**Eaton pumps** **EATON and Westinghouse equipment**

GUIDANCE INFORMATION

Perimeter Access System Services (PASS) **1785 West Armitage Court** **Addison, IL 60101** **630/556-4283**	**Gates**
Perfect Temperature Control **74 Bradrock** **Des Plaines, IL 60018** **847/635-0337**	**HVAC**
Peterson and Matz, Inc. **2250 Point Blvd., Suite 300** **Elgin, IL 60123** **847/844-4405**	**Wastewater equipment (middle man)**
Phoenix Systems & Service, Inc. **362 S. Schmale Rd.** **Carol Stream, IL 60188** **630/860-9501**	**Security system**
Polydyne Inc. **One Chemical Plant Rd.** **Riceboro, GA 31323** **800/848-7659**	**Dewatering Polymers**
Henry Pratt Company **401 South Highland Ave.** **Aurora, IL 60506** **630/844-4000**	**Henry Pratt equipment (Water Supply)**
PVS Chemical Solutions **10900 Harper Ave.** **Detroit, MI 48213** **800/932-8860**	**Sodium Bisulfite**
Rain For Rent **221 McDonald Ave.** **Joliet, IL 60431** **815/744-3947** **816/600-0022 – Mike Carroll**	**Portable pumping, Tanks, Pipe, Filtration, Spillgaurds**
Revere Electric **8807 187th St.** **Mokena, IL 60448** **708/995-3290**	**Electrical motor repairs** **Allen-Bradley**
Rowell Chemical Corporation **15 Salt Creek Lane** **Suite 205** **Hinsdale, IL 60521** **630/920-8833**	**Sodium Hypochlorite/ Sodium Bisulfite**
Royal Crane Service, Inc. **P.O. Box 1858** **Bridgeview, IL 60455**	**Large crane rental**

GUIDANCE INFORMATION

708/974-0832

Safety Supply Illinois **1040 Kingsland Dr.** **Batavia, IL 60510** **630/406-9666**	**Fire & safety**
Service Industrial Supply **506 Brookforest, Rt. 59** **Shorewood, IL 60431** **815/725-0062**	**Hose, rubber supplies**
Sievert Electric Service & Sales Co. **1230 South Hannah Ave.** **Forest Park, IL 60130** **708/771-1600**	**Crane & hoist service**
Simmers Crane Design & Services **415 31st Avenue** **Rock Island, IL 61201** **708/897-3169**	**Crane & hoist service**
Steiner Power Systems **1250 Touhy Ave.** **Elk Grove Village, IL 60007** **847/956-3162** **800/783-4637**	**Rental generators**
Sulzer **ABS USA** **140 Pond View Drive** **Meriden, CT 06450** **314/288-5134**	**WBB Blowers**
Triangle Environmental **12033 S. Spaulding School** **Plainfield, IL 60585** **815/595-4096**	**HVAC**
United Rentals **603 Airport Rd.** **North Aurora, IL 60542** **630/896-4945**	**Rental lighting**
USA-Rent-a-Fence **3049 Kelly Court** **Aurora, Il. 6504** **1-630-962-2535**	**Temporary Fence**
Vulcan Industries **212 S. Kirlin St.** **Missouri Valley, IA 51555** **712/642-2755** service@vulcanindustries.com	**Climber Screen parts & service**

GUIDANCE INFORMATION

Viking Chemical Company **1827 Eighteenth Avenue** **P.O. Box 1595** **Rockford, IL 61110** **815/397-0500**	**Chlorine cylinders and emergency response**
Water Products Company **3255 East New York Street** **Aurora, IL 60507** **630/898-6100**	**Pipe, valves & fittings**
Xylem **8402 W. 183rd St.** **Suite A** **Tinley Park, IL 60487** **708/990-4919**	**Flygt pump parts & service**

WD&C EMERGENCY VENDOR LISTING:

Abbott Rubber
2143 Lunt Ave.
Elk Grove Village, IL 60007
847-952-1800 ext. 3013 800-852-1855
sales@abbottrubber.com

ADS Environmental Services
1880 W. Fullerton Ave.
Chicago, IL 60614
312-236-5655
312-580-2691 (Fax)
frank.hobbs@adsenv.com

Advanced Automation & Controls, Inc.
780 Ridgeview Dr
McHenry IL 60050
815-578-0655
815-578-0677 (Fax)

Allan J. Coleman Co.
5725 N. Ravenswood Ave.
Chicago, IL 60660-3913
23671 Network Pl.
Chicago, IL 60673-1236
773-728-2400
773-728-2499 (Fax)

Allied Door, Inc.
P.O. Box 817
Lombard, IL 60148
630-279-0795
630-279-0882 (Fax)

GUIDANCE INFORMATION

Ambrose Plumbing
40 Drendel Ln
Naperville, IL 60565
630-631-9874
ambroseplumbing@gmail.com

American Underground Inc.
2075 Johns Court
Glenview, IL 60025
847-724-3503
847-724-3508 (Fax)

Apex Industrial Automation
2000 Albright Rd
Montgomery, IL 60538
866-924-2808
866-924-2809 (Fax)
sales@apexindustrialautomation.com

WD&C EMERGENCY VENDOR LISTING (Con't):

ATS Leak Detection
524 W. St. Charles Rd
Villa Park, IL 60181
630-834-7772
630-834-5501 (Fax)

Badger Meter Co., Inc
PO Box 88223
Milwaukee, WI 53288
800-876-3837
888-371-5982 (Fax)

Bakercorp
2205 E. Lincoln Hwy.
Chicago Heights, IL 60411
708-758-5277
708-758-5815 (Fax)

Balt's Power Sweeping, Inc.
559 Palmer Ave.
Aurora, IL 60506
630-892-4334
630-742-2617(cell)

Batavia Can
509 Batavia Ave.
Batavia, IL
630-879-8877
219-949-1008 (Fax)

Batteries Plus
115 E. Ogden Avenue

GUIDANCE INFORMATION

Naperville, IL 60540
630-355-8822
630-355-6874 (Fax)

Benchmark Sales & Service, Inc.
39 Industrial Drive
Gilberts, IL 60136
847-985-8814
800-281-3569
847-836-6287 (Fax)
bullis@benchmarksales.net

Buikema's Ace Hardware
1030 N. Washington St.
Naperville, IL 60563
630-355-0077
630-717-2690
630-355-9533 (Fax)
kbuikema@buikemaace.com

WD&C EMERGENCY VENDOR LISTING (Con't):

Bisping Construction Company
110 Ford Dr
New Lenox, IL 60451
815-485-9640 (Fax)

Cascade
Billy 630-675-6343

CEM Corporation
12750 Collection Center Dr
CHICAGO IL 60693
800-726-3331

Chemical Pump Sales & Service
P.O. Box 1627
Frankfort, IL 60423
815-464-1908
815-464-1929 (Fax)

CLA-VAL Inc.
P.O. Box 863
Elgin, IL 60121
847-697-1413
847-697-5549

Columbia Pipe and Supply
544 S. Lake St.
Aurora, IL 60609
630-896-7476
773-843-5721
773-927-8415 (Fax)
webmaster@columbiapipe.com

GUIDANCE INFORMATION

Construction by CAMCO
2125 Oak Leaf St.
Joliet, IL 60436
815-741-4455

Corridor Supply Co.
751 N. Bolingbrook Dr. #16
Bolingbrook, IL 60440
630-226-0017
630-226-0018 (Fax)

Corrpro Companies, Inc.
400 E. North Ave., Suite 2
Streamwood, IL 60107
630-483-2500
630-483-2655 (Fax)
kmonsen@corrpro.com

WD&C EMERGENCY VENDOR LISTING (Con't):

Crawford, Murphy & Tilly, Inc.
2750 West Washington St.,
Springfield, IL 62702
217-787-8050

Cues
3600 Rio Vista Ave
Orlando, FL 32805
407-849-0190
800-327-7791
407-425-1569 (Fax)
fiannoti@cuesinc.com

CWR Holdings LLC
1615 Cross Highway
Fairfield, CT 06824
203-292-3534
203-659-1300 (Info)
203-659-1301 (Sales)
203-286-2320 (Fax)
pkeblish@cwrholdings.com

Dahme Mechanical
610 S. Arthur Ave.
Arlington Hts., IL 60005
847-253-0341
847-253-9501

Discount Fence Company
709 Ogden Avenue
Downers Grove, IL 60515

GUIDANCE INFORMATION

630-971-1404

Dreisilker Electric Motors, Inc.
352 Roosevelt Rd.
Glen Ellyn, IL 60137
630-469-7510

DuPage Topsoil, Inc.
P.O. Box 387
Wheaton, IL 60189
630-682-4800
630-682-4996 (Fax)

Edward Corporate Health Services
P.O. Box 4207
Carol Stream, IL 60197-4207
630-527-7263

WD&C EMERGENCY VENDOR LISTING (Con't):

EESCO A Division of WESCO Distribution
3939 S Karlov Avenue
Chicago, IL 60632
773-650-7436
773-247-3333 (Fax)

EJ Equipment
P.O. Box 665
Manteno, IL 60950
800-522-2808
815-468-0250
815-468-0247 (Fax)
eric@ejequipment.com

Elmhurst Chicago Stone Company
P.O. Box 57
Elmhurst, IL 60126-0057
630-832-4000

Engsoft Solutions
729 Molalla Ave. Ste. #5
Oregon City, OR 97045
800-761-4999
506-650-5107 (Fax)

Environmental Products
2733-F Kanasita Rd.
Hixson, TN 37343
866-448-5547
423-876-4366
423-876-4389 (Fax)

GUIDANCE INFORMATION

dale@epasales.com

Expert Plumbing
562 West 5th Ave
Naperville, IL 60563
630-579-1996
630-548-9486 (Fax)

Expert Plumbing
424 Fort Hill Drive, Unit #122
Naperville, IL 60540
630-579-1996

Fastenal
518 W. 5th Ave.
Naperville, IL 60563
630-416-0903
630-416-3631
ilnap@stores.fastenal.com

WD&C EMERGENCY VENDOR LISTING (Con't):

First Environmental Laboratories, Inc.
1600 Shore Road
Naperville, IL 60563
630-778-1200

Fisher Scientific Company
Account # 568120-002
13551 Collections Center Drive
Chicago, IL 60693
412-490-8753

Flolo Corporation
1061 E. Green St.
P.O. Box 586
Bensenville, IL 60106-0586
630-595-1010
800-711-1296
630-595-1327 (Fax)

Flow Technics Inc.
181 Ontario St.
Frankfort, IL 60423
815-277-2600
815-534-5311 (Fax)
mikec@flowtechnics.com

Fox Valley Chlorinating
24W134 St. Charles Rd.
Carol Stream, IL 60188
630-510-0420

GUIDANCE INFORMATION

630-510-0712 (Fax)

Fullmer Locksmith Service, Inc.
8611 W. Cermak Rd.
North Riverside, IL 60546-1225
708-442-0300
708-442-0321 (Fax)

Gasvoda & Associates, Inc.
1530 Huntington Drive
Calumet City, IL 60409
708-891-4400
708-891-5786 (Fax)
jduschene@gasvoda.com

Gempler's
1210 Fourier St.
Suite 150, P.O. Box 44993
Madison, WI 53717
800-382-8473
608-662-3301
customerservice@gemplers.com

WD&C EMERGENCY VENDOR LISTING (Con't):

Global Fire Equipment-MES Municipal Emergency Services Inc.
401 Peoria St.
Washington, IL 61571
800-322-8402
309-444-8417
309-444-8555 (Fax)
elallen@mesfire.com

Gooding Rubber Co.
10321 Werch Drive, #200
Woodridge, IL 60517
630-685-2100
708-296-2964
630-685-4111 (Fax)
sales@goodingrubber.com
rwagner@goodingrubber.com

Godwin Pump (Xylem Dewatering Solutions)
16830 Chicago Ave.
Lansing, IL 60438
708-889-1560
Cell#: 815-341-5244
fred.ruschard@xyleminc.com

Grainger
2701 Ogden Ave.
Downers Grove, IL 60515-1704
630-810-9933

GUIDANCE INFORMATION

888-361-8649
630-810-0496 (Fax)

Hach Company
2207 Collections Center Drive
Chicago, IL 60693
970-669-2932 (Fax)

HBK Water Meter Service, Inc.
3701 Berdnick Street, Unit H
Rolling Meadows, IL 60008
847-202-4389
847-202-9869 (Fax)

Heartland Controls (Hach Flow meters)
P.O. Box 705
Frankfort, IL 60423
708-478-5210
Cell#:708-903-0858
708-478-5211 (Fax)
TimGowen@Heartland-controls.com

WD&C EMERGENCY VENDOR LISTING (Con't):

Herbo Tree Service, Inc.
27 W. 770 Warrenville Rd.
Warrenville, IL 60555
630-393-1726, 630-553-5156 (Fax)

Hoerr Construction
1601 W. Luthy Drive, #D
Peoria, IL 61615
309-691-6653
309-691-6739 (Fax)

Hogan Plumbing
30W265 Youghal Rd.
Warrenville IL 60555
630-393-7660
630-393-7713 (Fax)

Home Depot
2920 Audrey Ave.
Naperville, IL 60540
630-637-9200

Illinois Crane
1621 W. Chanute Road
Peoria, IL 61615
309-692-0856

Injection & Waterproofing Systems

GUIDANCE INFORMATION

232 S River Street
Aurora, IL 60506
630-892-9400
630-892-0300 (Fax)

Insituform Technologies USA, Inc.
702 Spirit 40 Park Dr.
Chesterfield, MO 63005
636-530-8000
800-234-2992
Chicago Office:
11351 W. 183rd
Orland Park, IL 60467
708-326-5028
708-478-4871 (Fax)

Itron
P.O. Box 200209
Dallas, TX 75320-0209
800-635-5461
509-241-6027 (Fax)

WD&C EMERGENCY VENDOR LISTING (Con't):

J & S Construction Sewer & Water
P O Box 760
Oswego, IL 60543
630-585-8000

J Congdon Sewer Service, Inc.
170 Alexander Way
Carol Stream, IL 60188
630-510-2434
630-510-9255 (Fax)

J Mooncotch Crane Rental
7061 South Willow Springs Road
Countryside, IL 60525
708-354-5759
708-354-5948 (Fax)

John Burns Construction Company
P.O. Box 827
Orland Park, IL 60462
708-326-3500
708-479-4956 (Fax)

Just Safety, Ltd
P.O. Box 9630
Naperville, IL 60564
630-904-9860
630-904-2157 (Fax)

GUIDANCE INFORMATION

Lang Ice Company
3604 W. 59 Street, Chicago, IL 60629
773-735-5000
800-275-5264
773-735-0794 (Fax)
info@langice.com

Lee Jensen Sales Co. Inc.
101 W. Terra Cotta Ave.
Crystal Lake, IL 60014-3507
815-459-0929
815-459-6458 (Fax)
ljsales@leejensensales.com

LMK Enterprises, Inc.
1779 Chessie Lane
Ottawa, IL 61350
815-433-1275
888-433-1275
815-433-0107 (Fax)
gmatthews@lmkenterprises.com

WD&C EMERGENCY VENDOR LISTING (Con't):

Lowe's
1440 S. Route 59
Naperville, IL 60564
630-445-6226
630-445-6227 (Fax)

Mark Kresmery Construction
1725 Weld Rd.
Elgin, IL 60123
847-429-0909
847-429-0930 (Fax)
marc@kresmary.com

M E Simpson Co., Inc.
3406 Enterprise Avenue
Valparaiso, IN 46383
800-255-1521
888-531-2444 (Fax)

McMaster-Carr
600 County Line Rd.
Elmhurst, IL 60126
630-834-9600
630-833-0300
630-600-3600
630-834-9427 (Fax)
chi.sales@mcmaster.com

GUIDANCE INFORMATION

Meade Electric Company
P.O. Box 74631
Chicago, IL 60675-4631
708-588-2500
708-588-2501 (Fax)

Menards
715 Fort Hill Dr.
Naperville, IL 60540
630-778-6710
630-778-6711 (Fax)

Metropolitan Industries, Inc.
37 Forestwood Dr.
Romeoville, IL 60446-1343
815-886-9200
800-323-1665
815-886-6932 (Fax)
chicagosales@metropolitanind.com

WD&C EMERGENCY VENDOR LISTING (Con't):

Michels Corporation
817 W. Main St.
Brownsville, WI 53006
16500 West Rodgers Drive
New Berlin, WI 53151
920-583-3132
262-814-0100
920-583-3429 (Fax)
262-814-0300 (Fax)
920-924-4320 (Fax)
kellyo@gelco-services.com
corpinfo@michels.us

Mid American Water
1500 Mountain
Aurora, IL 60505
630-851-4500
630-851-4789 (Fax)

Midwest Chlorinating - LINESTOP
630-539-7459

Midwest Chlorinating & Testing
420 South Western Avenue
Bartlett, IL 60103
630-372-0293

GUIDANCE INFORMATION

Nagel Trucking & Materials, Inc.
1043 Paramount Parkway
Batavia, IL 60510
630-879-6600

Naperville Excavating, Inc.
1805 High Grove Lane
Naperville, IL 60540
630-355-1400

Northern Safety Co.
P.O. Box 4250
Utica, NY 13504-4250
800-631-1246
800-568-2764 (Sales)
800-635-1591 (Fax)
custsvc@northernsafety.com
sales@northernsafety.com

WD&C EMERGENCY VENDOR LISTING (Con't):

Northern Tool & Equipment
2800 Southcress Drive West
P.O. Box 1219
Burnsville, MN 55337-0219
800-221-0516
952-894-0326
952-894-6132 (Fax)

Omni-Pump Repairs, Inc.
9224 Chestnut Ave.
Franklin Park, IL 60131
847-451-0000
847-451-0119 (Fax)

Park Vending, Inc.
420 Hill Ave.
Aurora, IL 60505
630-851-5036
800-690-8907
630-851-5065 (Fax)
info@parkvending.com

Performance Pipelining
1779 Chessie Lane
Ottawa, IL 61350
815-433-0080

GUIDANCE INFORMATION

815-431-0307 (Fax)
sflanery@ppi-liner.com

Pezza Landscaping, Inc.
P.O. BoX 308
Warrenville, IL 60555
630-393-7373
630-393-1110 (Fax)

Phil Walz Plumbing, Inc.
1340 W. Ogden Ave.
Naperville, IL 60563
630-355-0080
630-355-6481 (Fax)

Phil's Topsoil
12763 Elaine Dr.
Plainfield, IL 60585-9765
815-436-7447
815-439-9935 (Fax)

Premier Fall Protection
964 Commerce Dr.
Union Grove, WI 53182
888-892-9888 ext 120
262-752-2475 (Fax)

WD&C EMERGENCY VENDOR LISTING (Con't):

Pro-Dive, Inc.
501 Illinois Avenue
Ottawa, IL 61350
815-433-5228
815-434-2433 (Fax)

Quality Backflow Testing, Inc.
P.O. Box 175
Western Springs, IL 60558-0175
708-246-9250
708-246-9260 (Fax)
information@qualitybackflow.com

Rain for Rent
221 McDonald Ave.
Joliet, IL 60431
815-744-3947
815-744-4820 (Fax)
mgreen@rainforrent.com

R J Kuhn
585A Route 31
Oswego, IL 60543
630-554-3336
630-892-7509 (Fax)

GUIDANCE INFORMATION

Revere Electric
3866 Paysphere Circle
Chicago, IL 60674
312-528-2323
312-738-4047 (Fax)

Safety Supply Illinois
1040 Kingsland Dr.
Batavia, IL 60510
630-406-9666
630-406-6195 (Fax)
info@safetysupplyillinois.com

Saf-T-Gard International, Inc.
P.O. Box 66593
Chicago, IL 60666-0593
847-291-1600
222-548-4273 (Fax)

Seiler Instrument
170 E Kirkham Ave.
St. Louis, MO 63119
630-321-0039
630-321-0328 (Fax)

WD&C EMERGENCY VENDOR LISTING (Con't):

Sewer Equipment of America
1590 Dutch Rd.
Dixon, IL 61021
800-323-1604
815-835-5566
815-284-0452 (Fax)
sales@sewerquipment.com

Sheridan Plumbing & Sewer
100 Tower Drive, Suite 116
Burr Ridge, IL 60527
630-366-2480
630-366-2488 (Fax)
tcollins@spands.com

Sievert Crane & Hoist
1230 S. Hannah
Forest Park, IL 60130
708-405-5154
708-405-5174 (Fax)

Standard Equipment, Co.
2033 W. Walnut St.
Chicago, IL 60612

GUIDANCE INFORMATION

312-706-9675
312-829-6142 (Fax)
tmarkel@standardequipment.com

Tallman Equipment
870 S. Countyline Rd.
Bensenville, IL 60106
877-860-5666
630-860-5669 (Fax)
sales@tallmanequipment.com

Test Gauge Industries
125 E Higgins Road
Gilbert, IL 60136
847-836-8690
847-836-9455 (Fax)

Thomas Pump Co., Inc.
2301 E. Liberty St.
Aurora, IL 60504
630-851-9393

Tool Repair Service, Inc.
23824 Andrew Rd. #104
Plainfield, IL 60585-8768
815-609-8941
815-609-8943 (Fax)

WD&C EMERGENCY VENDOR LISTING (Con't):

Traffic Control Protection
31W351 North Ave.
West Chicago, IL 60185
630-293-0026
630-293-0029 (Fax)

United Laboratories
P.O. Box 410
St. Charles, IL 60174-0410
630-377-0900
800-323-2501
630-773-0595 (Fax)

United Rentals
880 N. Addison Rd.
Villa Park, IL 60181
630-932-4600
800-UR-RENTS
630-932-7611 (Fax)

USA Blue Book, Inc.
P O Box 9004
Gurnee, IL 60031-9004

GUIDANCE INFORMATION

800-548-1234

Valmatic Valve and Mfg. Corp.
905 Riverside Dr.
Elmhurst, IL 60126
630-941-7600
630-993-4027
630-941-8042 (Fax)
valves@valmatic.com

Visu-Sewer Clean & Seal, Inc.
W230 N4855 Betker Dr.
Pewaukee, WI 53072
262-695-2340
800-876-8478
262-695-2359 (Fax)
visu-info@visu-sewer.com

Visu-Sewer of Illinois
9014 S. Thomas
Bridgeview, IL 60455
708-237-0340
800-876-8478
708-237-0360 (Fax)
dap@visu-sewer.com

WD&C EMERGENCY VENDOR LISTING (Con't):

Wachs Utility Services
600 Knightsbridge Parkway
Lincolnshire, IL 60069
800-525-5821
847- 484-2671 (Fax)

Water Products-Aurora
3255 East New York
Aurora, IL 60504
630-898-6100
630-898-1067 (Fax)

Water Services, Inc.
848 Olive Street
Attn: Anthony Gattuso
Elgin, IL 60120-8027
847-697-6623
847-697-6675 (Fax)

Weldstar, Co.
1750 Mitchell Rd.
P.O. Box 1150

GUIDANCE INFORMATION

Aurora, IL 60507
630-859-3100

Wesco Distribution, Inc.
3654 Swenson Ave.
St. Charles, IL 60174
630-513-8135
630-513-8143 (Fax)
epfotenhauer@wesdodist.com

West Side Tractor
1400 W. Ogden Ave.
Naperville, IL 60563-3909
630-355-7150
630-355-7173 (Fax)
tstern@westsidetractor.net

Western Utility Contractors
2565 Palmer Ave.
University Park, IL 60484
708-235-1408

Wunderlich-Malec
937 National Ave.
Addison, IL 60101
630-827-0200
630-827-0208 (Fax)
wm@ng.com

WD&C EMERGENCY VENDOR LISTING (Con't):

Xylem
8402 W. 183rd St.
Tinley Park, IL 60487
708-342-0484
708-342-0491 (Fax)

Zack Moga Sewer Service
1420 W. Downer Place
Aurora, IL 60506
630-892-7728

Ziebell Water Service Product
2001 Pratt Blvd.
Elk Grove Village, IL 60007
847-364-0670

CITY OF NAPERVILLE SANITARY SEWER OVERFLOW RESPONSE PLAN

Procedure: Reporting and Estimating Noncompliance Sewer Overflows
10/03/19

Noncompliance is defined as discharge of untreated sewage from the sanitary sewer collection system to a surface water and/or ground. This includes basement backups due to heavy rainfalls, mainline backups, or lift station failures.

1. When an event occurs, contact the IEPA within 24 hours from the time we become aware of the event.

   IEPA
   Maureen Brehmer
   Email: Maureen.brehmer@illinois.gov
   Phone: (847) 294-4054
   Fax: (847) 294-4018

   Also provide a brief description of the event

2. A written report must be submitted within five (5) days from the time we become aware of the event. The report titled "Sanitary Sewer Overflow or Bypass Notification Summary Report" is available at epa.state.il.us/water/forms. Submit the form electronically when completed.

3. If the NOC or SOC lagoons overflow, take samples and estimate the volume using the following procedure:

   a) Immediately take two (2)– 1-liter samples to Springbrook laboratory. Sample testing must be started within 6 hours, and must be labeled with location, time and date. Samples must be kept refrigerated. Daily grab samples must be taken for the duration of the overflow. During non-working hours, contact the lab as follows:

	Home	**Work**
○ Lisa McNames	708/805-1054	X6121
○ Joseph Slevnik – Manager	630/983-5491	x6125
○ Jill Thiel - Chemist	630/293-4324	x6128
○ Bill Goerich – Utility Tech 3	630/585-0180	x6128

   b) Take samples of the DuPage River just upstream of NOC and SOC lagoon discharge points.
      SOC - At the Bailey Road Bridge just east of Washington Street.
      NOC - At the Ogden Avenue Bridge just west of NOC.

   c) Keep a log of the "hours" of overflow and estimate the volume (10" flight at SOC= 288,000 gph; SOC lagoon force main valve=10,000 gpm; 6" pump= 49,500 gph; 4" pump = 24,000 gph; 8" Baker pump = 4,000 gpm). If the divertible valve at NOC is operated, SCADA will report gpm.

4. We must do everything we can to reduce and eliminate overflows. We are not authorized by Permit to discharge.

5. Wastewater backups due to maintenance issues on private sanitary service laterals are the responsibility of the property owner and are not part of the Overflow Response Plan. These issues are covered under ordinance 92-234, 12-15-1992.

   **Basement backups can have multiple causes, such as maintenance issue on private service laterals, construction issues, acts of god and other causes.*

6. Overflows on private property caused by sanitary sewer main line surcharging are to be reported to the IEPA. The 24-hour notification process should be used with as much information as possible including the private property address. If the discharge enters the storm sewer system, DPW Storm Sewer personnel (630/420-6095) must be notified.

7. Send Regulatory Compliance Manager and Reclamation Division Manager a copy of any IEPA SSO reports.

8. Drain plugs will be given to any property owner that is experiencing a basement backup during heavy rain/flooding events. The property owner will have to install any plugs. Water Utilities team members will not enter any flooded areas to install drain plugs.

9. Any claims for damage, clean-up or restoration due to basement backups during heavy rain, flooding, public main line issues or public pump station issues shall be given to the City of Naperville's Claims Administrator at 630-305-5124 or lesaks@naperville.il.us

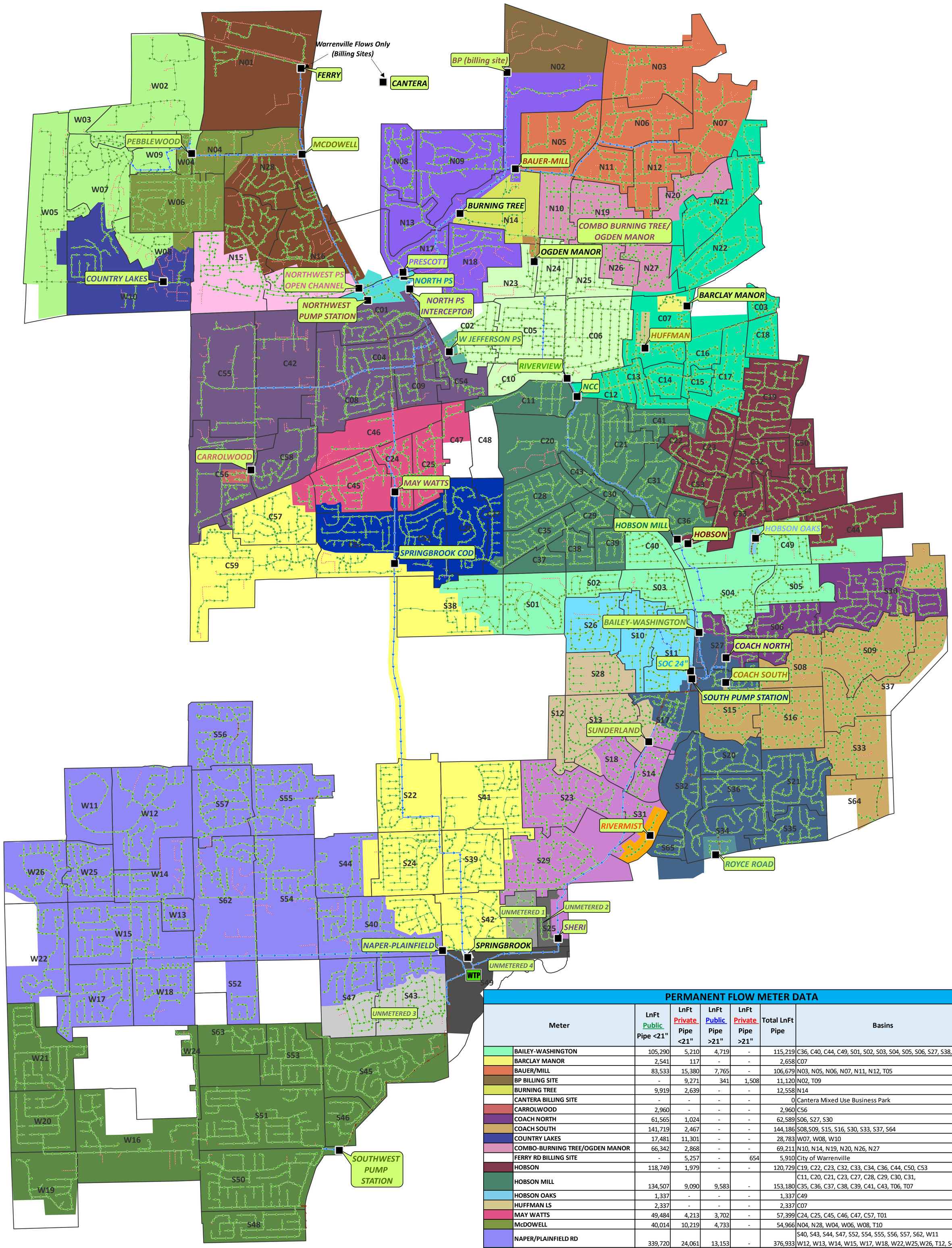
   **Submission of a claim does not mean the city is accepting liability for any damages or construed as a guarantee of payment.*

10. Third Party Notification requirements:

    a) Third party notifications may be warranted by overflows that may endanger public health due to a likelihood of human exposure.
    b) Notification must first be reviewed and approved by the Director of Public Utilities-Water.
    c) Notification must be coordinated with the City's Communication Manager.
    d) Notification shall be made to the public, health agencies, and other affected entities.
    e) Notification should include the following:
        - ✓ Reason for the discharge
        - ✓ The beginning and ending time of the discharge
        - ✓ Water or land area, or both, receiving the discharge
        - ✓ Volume and quality of the discharge

Permanent Flow Monitors and Tributaries

N
Not to Scale



PERMANENT FLOW METER DATA

Meter	LnFt Public Pipe <21"	LnFt Private Pipe <21"	LnFt Public Pipe >21"	LnFt Private Pipe >21"	Total LnFt Pipe	Basins	Total Acres
BAILEY-WASHINGTON	105,290	5,210	4,719	-	115,219	C36, C40, C44, C49, S01, S02, S03, S04, S05, S06, S27, S38, T06	987
BARCLAY MANOR	2,541	117	-	-	2,658	C07	19
BAUER/MILL	83,533	15,380	7,765	-	106,679	N03, N05, N06, N07, N11, N12, T05	1,002
BP BILLING SITE	-	9,271	341	1,508	11,120	N02, T09	215
BURNING TREE	9,919	2,639	-	-	12,558	N14	149
CANTERA BILLING SITE	-	-	-	-	0	Cantera Mixed Use Business Park	-
CARROLWOOD	2,960	-	-	-	2,960	C56	15
COACH NORTH	61,565	1,024	-	-	62,589	S06, S27, S30	435
COACH SOUTH	141,719	2,467	-	-	144,186	S08,S09, S15, S16, S30, S33, S37, S64	1,071
COUNTRY LAKES	17,481	11,301	-	-	28,783	W07, W08, W10	389
COMBO-BURNING TREE/OGDEN MANOR	66,342	2,868	-	-	69,211	N10, N14, N19, N20, N26, N27	663
FERRY RD BILLING SITE	-	5,257	-	654	5,910	City of Warrenville	-
HOBSON	118,749	1,979	-	-	120,729	C19, C22, C23, C32, C33, C34, C36, C44, C50, C53	943
HOBSON MILL	134,507	9,090	9,583	-	153,180	C11, C20, C21, C23, C27, C28, C29, C30, C31, C35, C36, C37, C38, C39, C41, C43, T06, T07	1,268
HOBSON OAKS	1,337	-	-	-	1,337	C49	10
HUFFMAN LS	2,337	-	-	-	2,337	C07	14
MAY WATTS	49,484	4,213	3,702	-	57,399	C24, C25, C45, C46, C47, C57, T01	553
McDOWELL	40,014	10,219	4,733	-	54,966	N04, N28, W04, W06, W08, T10	418
NAPER/PLAINFIELD RD	339,720	24,061	13,153	-	376,933	S40, S43, S44, S47, S52, S54, S55, S56, S57, S62, W11 W12, W13, W14, W15, W17, W18, W22,W25,W26, T12, S40	3,476
NORTH CENTRAL COLLEGE (NCC)	116,710	5,701	-	-	122,411	C03, C07, C12, C13, C14, C15, C16, C17, C18, N07, N21, N22	1,008
NORTH PUMP STATION	4,892	613	3,244	-	8,749	C01, N16, T03, T04,T05	70
NPS INTERCEPTOR	123,995	24,374	11,292	-	159,661	C01, C04, C08, C09, C42, C54, C55, C56, C58, T03	1,631
NORTHWEST PUMP STATION	62,465	25,274	9,950	-	97,689	N01, N15, N16, N28	1,016
NORTHWEST PS OPEN CHANNEL	33,264	4,058	-	-	37,322	N15, N16	318
OGDEN MANOR	1,243	403	-	-	1,646	N14, N23	12
PEBBLEWOOD	68,924	13,594	4,237	-	86,755	W02, W03, W04, W05, W07, W08, W09, T10	1,028
PRESCOTT	67,818	18,454	11,424	-	97,696	C01, N05, N09, N13, N14, N17, N18, T05, T09	946
RIVERMIST	3,212	-	-	-	3,212	S31	43
RIVERVIEW	97,610	6,041	4,377	-	108,028	C02, C05, C06, C10, N23, N24, N25, T07, T08	787
ROYCE ROAD	2,986	-	-	-	2,986	S34	26
SHERI	82,273	1,454	10,207	-	93,934	S14, S17, S18, S23, S29, S31, S32, T02	759
SOC 24"	42,902	1,309	4,069	-	48,280	S10, S11, S26, T11	379
SOUTH PUMP STATION	101,530	3,750	4,841	-	110,121	S15, S17, S20, S21, S27, S32, S34, S35, S36, S65, T06, T11	943
SPRINGBROOK	173,514	5,734	19,259	-	198,506	C51, C52, C57, C59, S22, S24, S29, S38, S39, S40, S41, S42, T01	1,737
SPRINGBROOK COD	60,490	1,986	3,035	-	65,511	C24, C25, C26, C27, C45, C46, C47, C51, C52, C57, T01	514
SUNDERLAND	55,421	503	814	-	56,738	S12, S13, S17, S18, S28, T02	361
SW PUMP STATION	226,291	7,876	736	-	234,903	S45, S46, S48, S50, S51, S53, S63, W16, W19, W20, W21, W24	2,307
W JEFFERSON PUMP STATION	2,009	-	-	-	2,009	C02	17
UNMETERED 1	8,576	-	-	-	8,576	S42	73
UNMETERED 2	2,901	-	-	-	2,901	S25	36
UNMETERED 3	30,662	701	-	-	31,363	S43, S47	245
UNMETERED 4	-	118	8,714	-	8,832	S25, S49	173
TOTAL LF	*2,547,189*	*227,039*	*140,195*	*2,162*	*2,916,584*	*TOTAL ACREAGE*	*26,056*

DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/16/2019

City of Naperville
Department of Public Utilities - Water

Cracker Barrel Tributary Proposed Flow Monitoring

Proposed Flow Meter Location and Tributary

Location: W02-009
LF Public Main: 7,650
LF Private Main: 1,998
LF Force Main: 1,171
Acreage: 183

LEGEND

- Flow Meter
- Tributary Area
- Lift Station
- Sewer Basin

Sewer Manhole

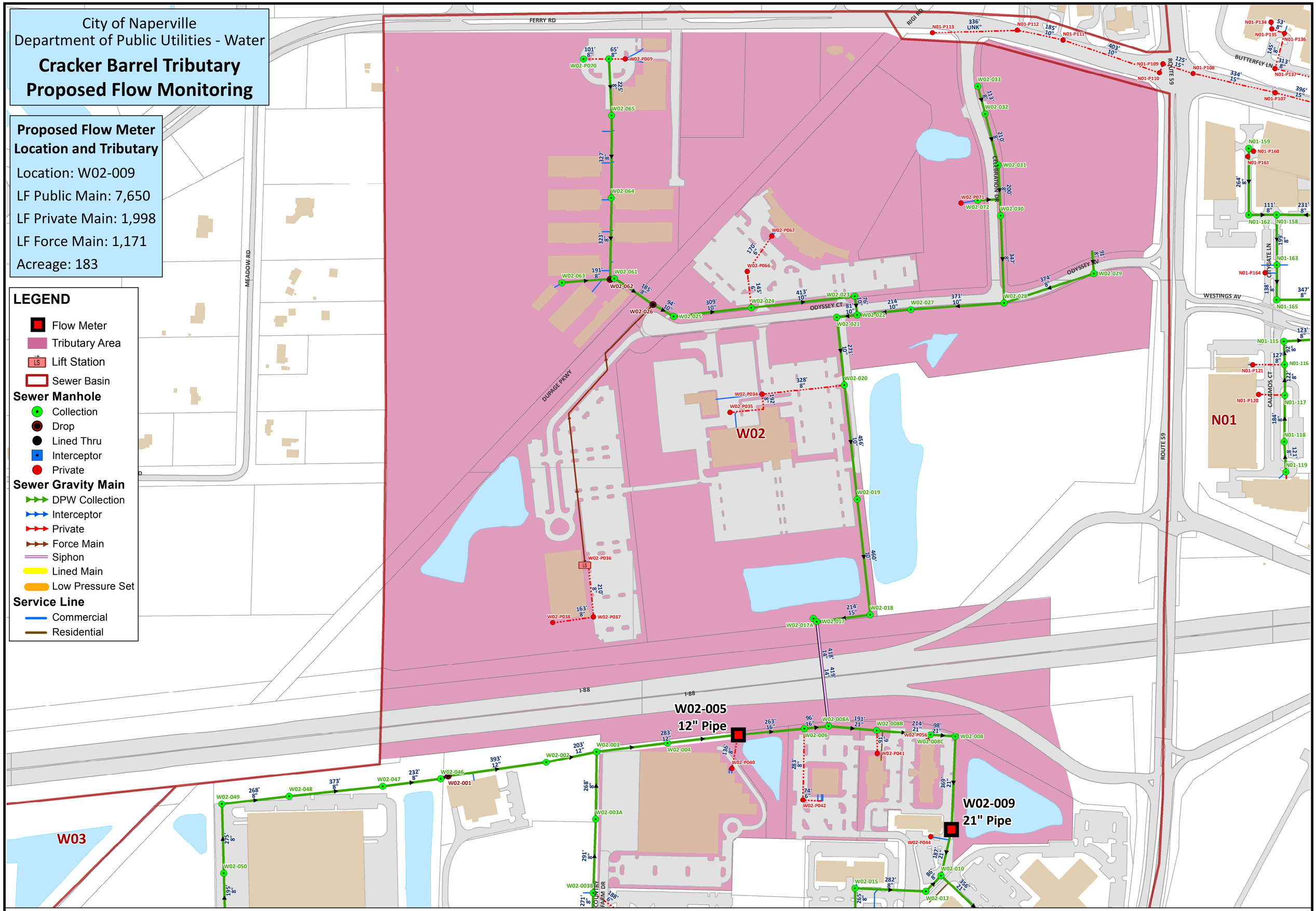
- Collection
- Drop
- Lined Thru
- Interceptor
- Private

Sewer Gravity Main

- DPW Collection
- Interceptor
- Private
- Force Main
- Siphon
- Lined Main
- Low Pressure Set

Service Line

- Commercial
- Residential



DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/16/2019

Cracker Barrel Tributary

N

City of Naperville
Department of Public Utilities - Water

West Highlands Lift Station Tributary Proposed Micro Flow Monitoring

Proposed Flow Meter Locations and Tributaries

Location	LF Main	Acreage
C35-018	6107	52
C35-021	2300	16
C37-002	2712	21
C38-005	4363	29
Unmetered	3078	17

LEGEND

- Flow Meter
- Lift Station
- Sewer Basin

Sewer Manhole

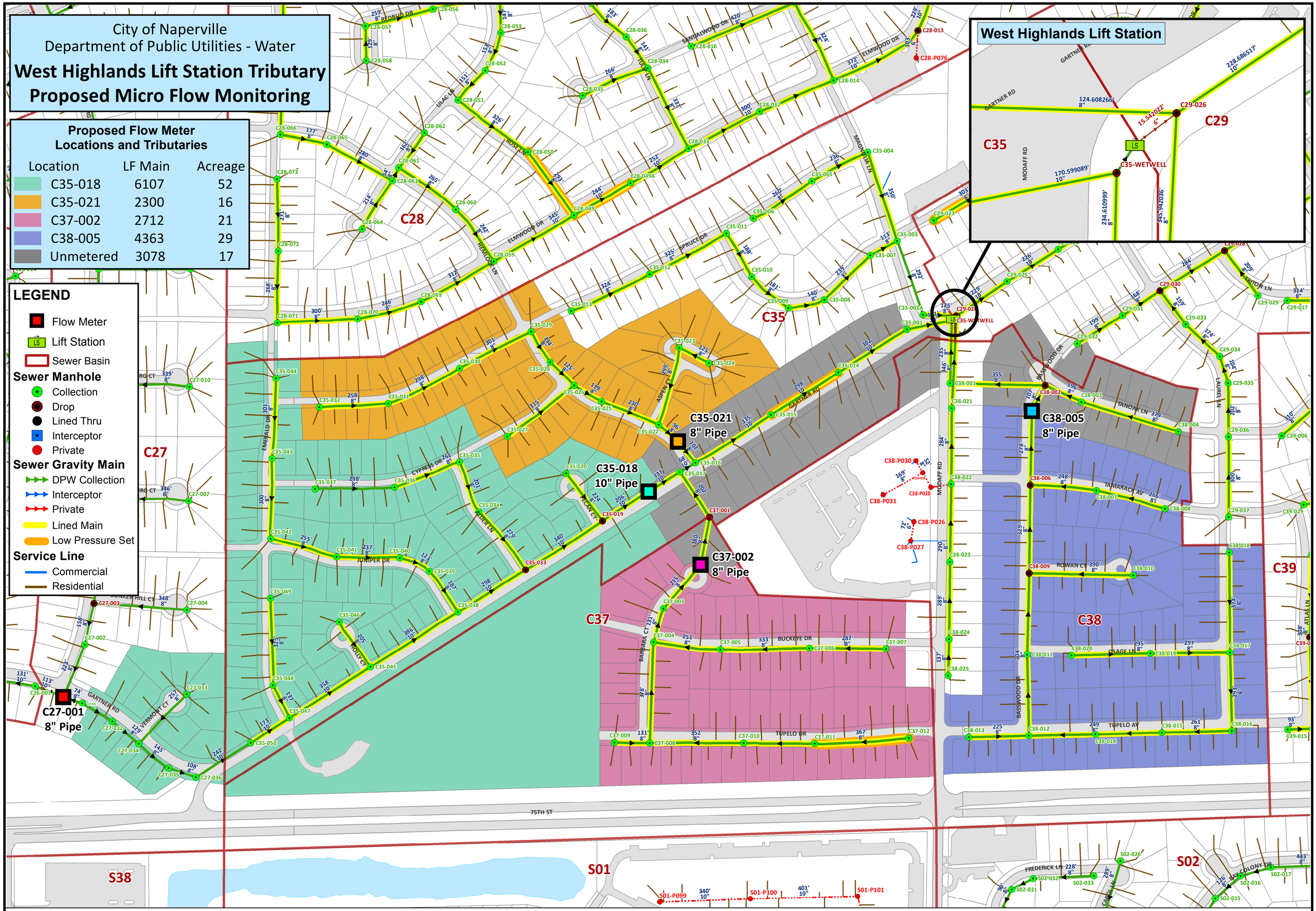
- Collection
- Drop
- Lined Thru
- Interceptor
- Private

Sewer Gravity Main

- DPW Collection
- Interceptor
- Private
- Lined Main
- Low Pressure Set

Service Line

- Commercial
- Residential

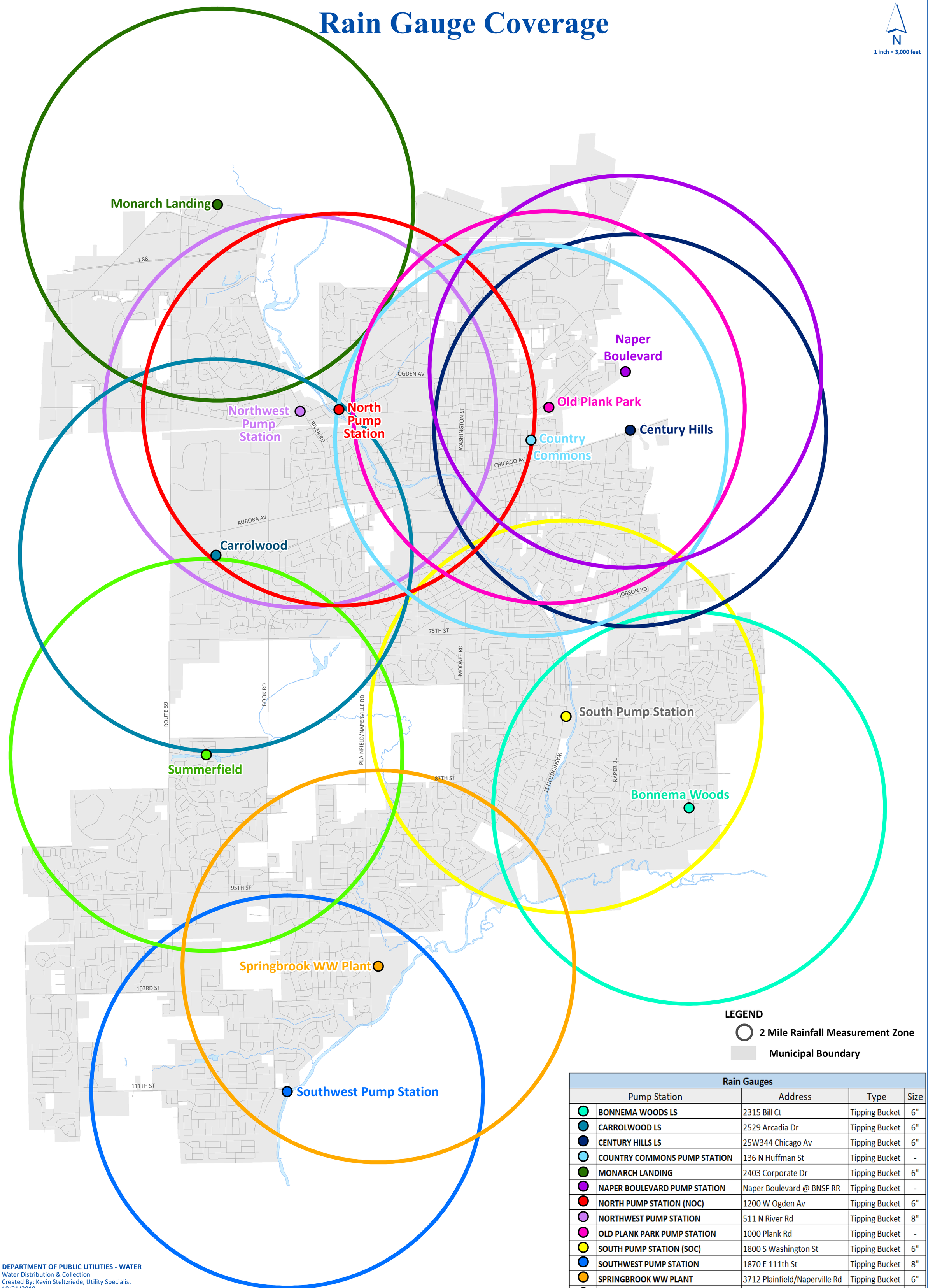


DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/16/2019

West Highlands Lift Station Tributary

N

Rain Gauge Coverage

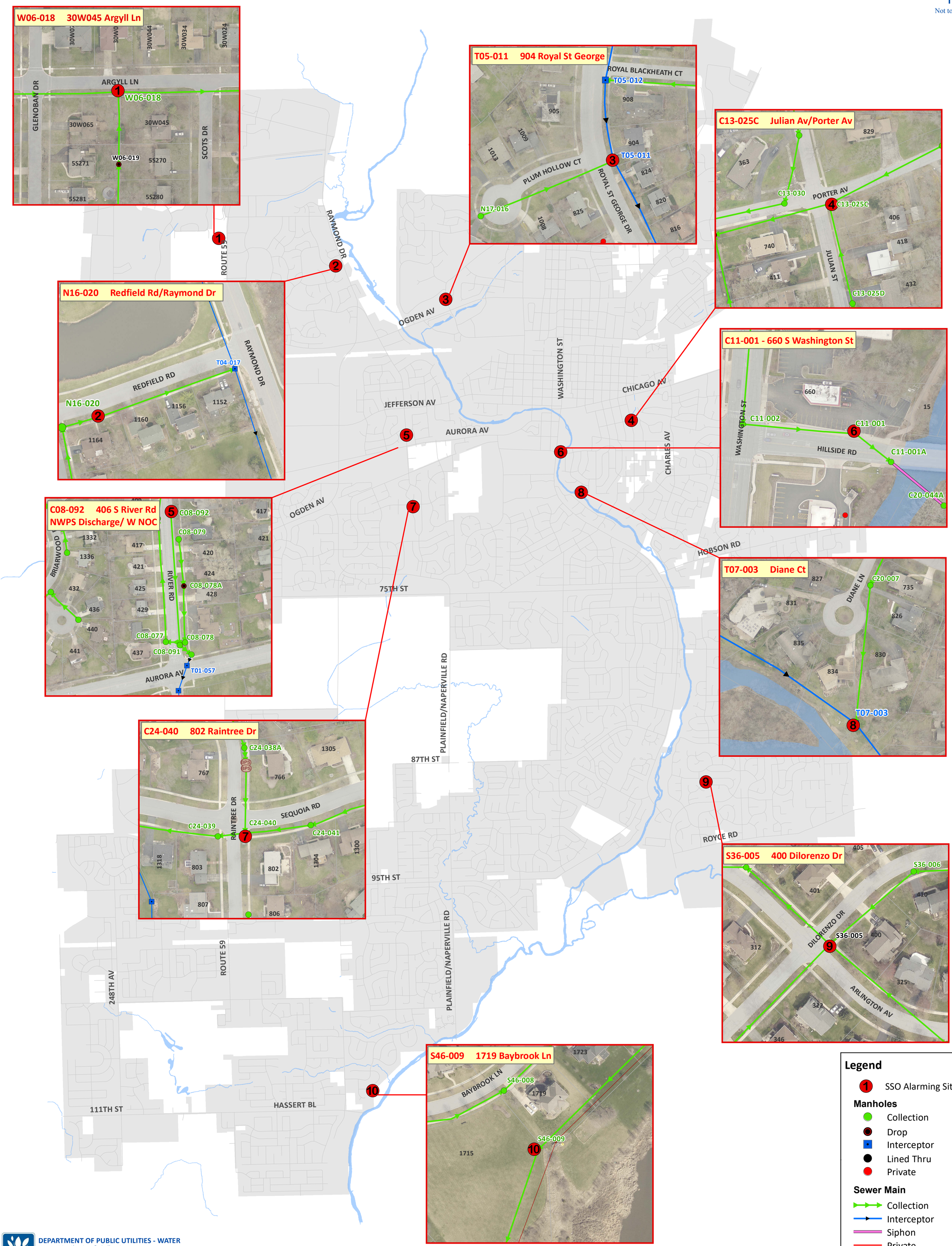


Rain Gauges				
	Pump Station	Address	Type	Size
	BONNEMA WOODS LS	2315 Bill Ct	Tipping Bucket	6"
	CARROLWOOD LS	2529 Arcadia Dr	Tipping Bucket	6"
	CENTURY HILLS LS	25W344 Chicago Av	Tipping Bucket	6"
	COUNTRY COMMONS PUMP STATION	136 N Huffman St	Tipping Bucket	-
	MONARCH LANDING	2403 Corporate Dr	Tipping Bucket	6"
	NAPER BOULEVARD PUMP STATION	Naper Boulevard @ BNSF RR	Tipping Bucket	-
	NORTH PUMP STATION (NOC)	1200 W Ogden Av	Tipping Bucket	6"
	NORTHWEST PUMP STATION	511 N River Rd	Tipping Bucket	8"
	OLD PLANK PARK PUMP STATION	1000 Plank Rd	Tipping Bucket	-
	SOUTH PUMP STATION (SOC)	1800 S Washington St	Tipping Bucket	6"
	SOUTHWEST PUMP STATION	1870 E 111th St	Tipping Bucket	8"
	SPRINGBROOK WW PLANT	3712 Plainfield/Naperville Rd	Tipping Bucket	6"
	SUMMERFIELD LS	1939 Skylane Dr	Tipping Bucket	6"

DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/21/2019

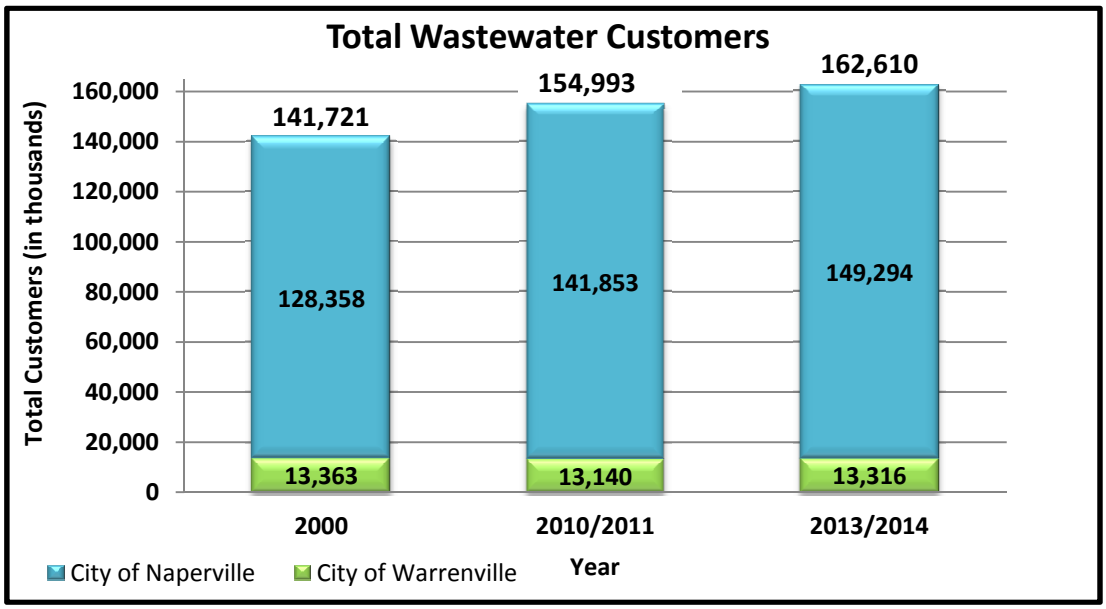
SSO ALARMING SITES

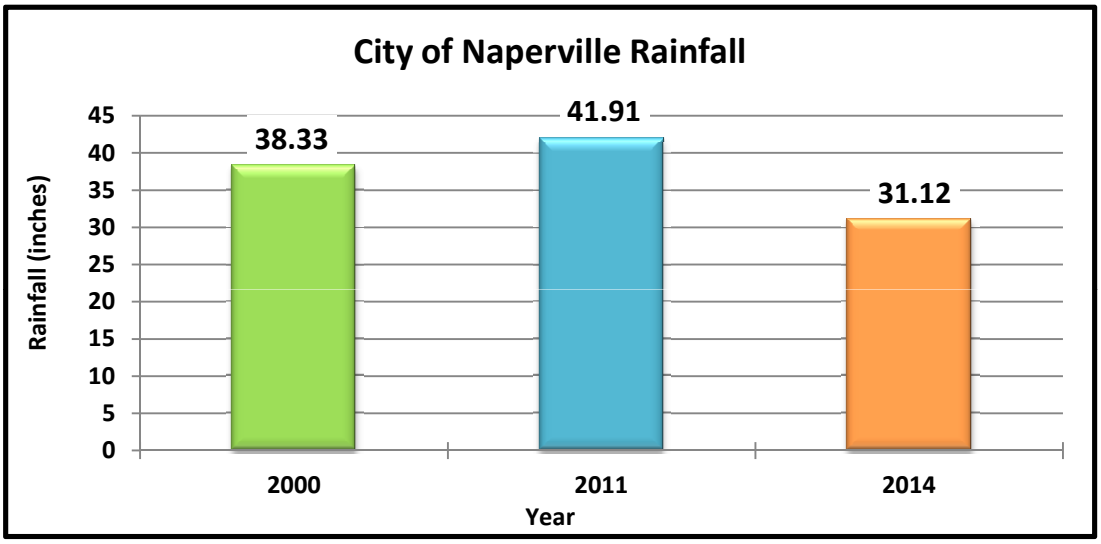
N
Not to Scale

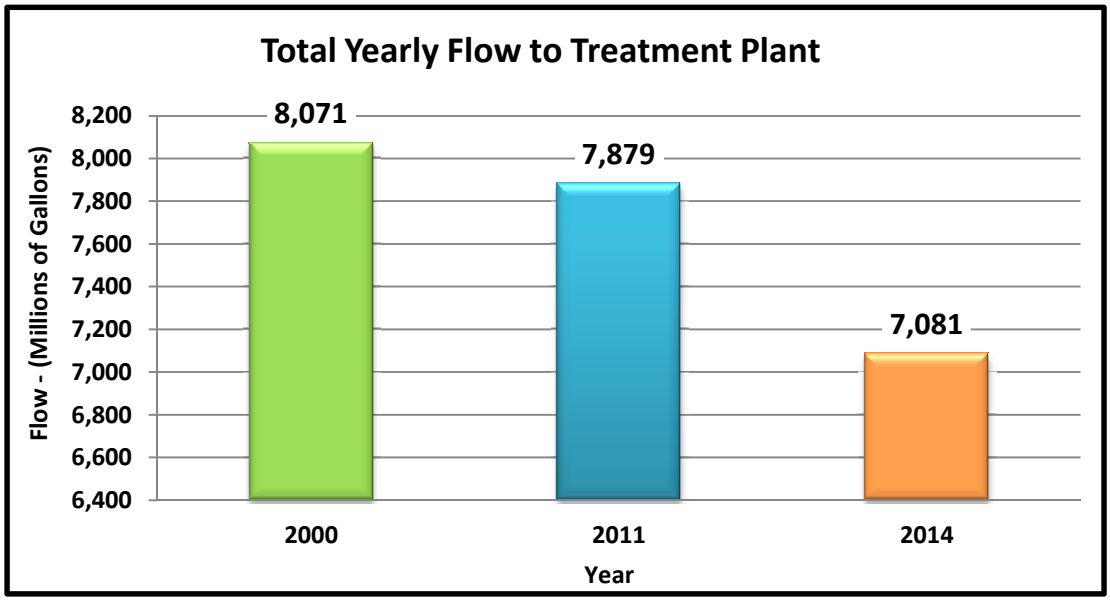


DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/16/2019

City of Naperville - Rehab Reduction Cost

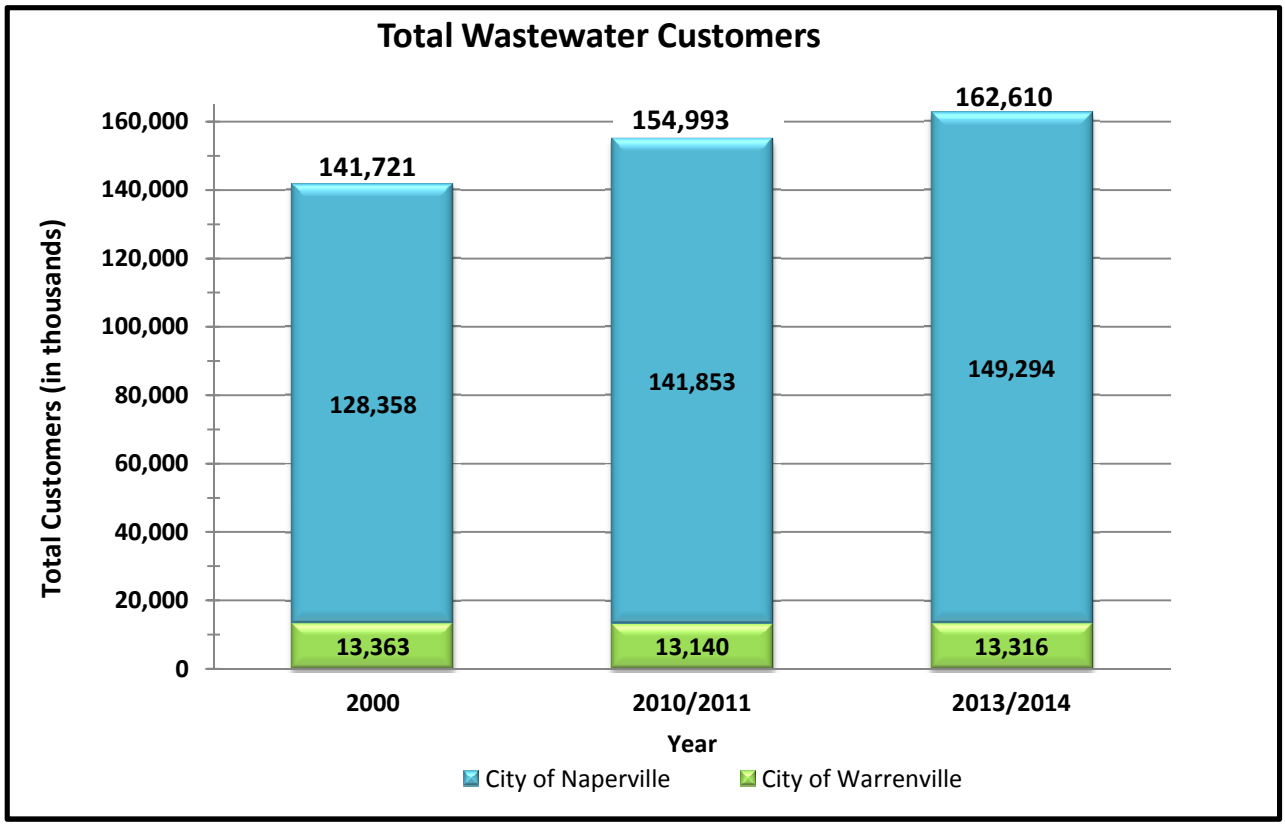


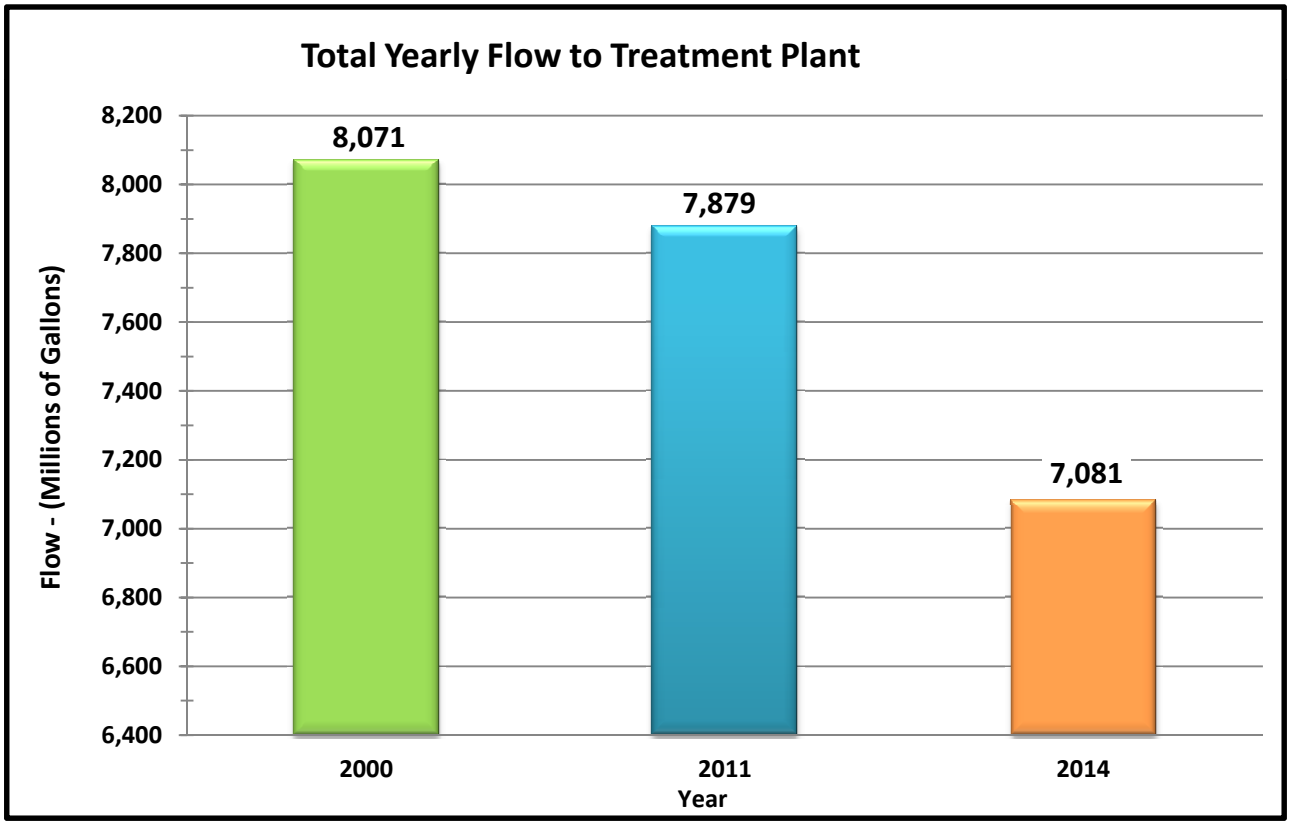




*Yearly Sanitary sewer main maintenance cost saving $33,600 (.30 x 112, 000 = $33,600)
Costs compare Rootcutting versus Jet Flushing yearly. Other cost saving not reflected by this graph:
Lift Station maintenance & electricity, and Treatment Plant maintenance & electricity

City of Naperville - Rehab Reduction Cost





*Yearly Sanitary sewer main maintenance cost saving $33,600 (.30 x 112, 000 = $33,600)

Costs compare Rootcutting versus Jet Flushing yearly. Other cost saving not reflected by this graph: Lift Station maintenance & electricity, and Treatment Plant maintenance & electricity

Lift Station Monthly Inspection Example

Cityworks

Inbox | Recent | New Service Request | New Work Order

Inspection | Email | Print | Save | Close

Inspection | Details

Id: 9029

Location: 2426 Trillium Ln

Status: Completed

Resolution:

Insp. Date: 08/5/2019 12:00 PM

Inspected By: SUBAT, STEVEN

Observations

Check Generator/VS Form	☑
Check Valve Operation	☑
Check Valve Vault	☑
Clean Floats when needed	☑
Check Wetwell	☑
Visual of Control Panel inside/out	☑
Cleanup Station	☑

Reset

Comments

Observation: perform monthly-gen hrs 632.4 good, cabinet good, wetwell good, valve pit good

Repairs:

Recommendation:

Cond. Score: 0

Large Pump Station Semi-Annual Inspection Example

Cityworks

Inbox | Recent | New Service Request | New Work Order

Inspection | Email | Print | Save | Close

Inspection | Details

Id: 9020

Location: 511 N River Rd

Status: Not Started

Resolution:

Insp. Date:

Inspected By:

Odor Control System

- Clean mist bearings ☐
- Grease bearings ☐
- Grease seal ☐
- Grease motor ☐
- Check all bolts ☐
- Check all screw sets ☐
- Check hoses and gauges ☐
- PSI readings ☐
- Check belts and condition ☐
- Check all electrical connections ☐
- Exercise all valves ☐
- Check ground lugs ☐

Observations

- Check Valve Operation ☐
- Check valve vault ☐
- Clean floats and tranducer ☐
- Check wetwell ☐
- Visual of Control Panel inside/out ☐
- Cleanup Station ☐
- Clean/Replace all MCC/VFD Air Filters ☐
- Visual Inspection of buildings & grounds ☐
- Operate Crane (rake rags 2x per month) ☐
- Visual Inspection of Air Valve NWPS-AIR1 (511 River Rd) ☐
- Visual Inspection of Air Valve NWPS-AIR2 (Corner River/Ogden) ☐
- Visual Inspection of Air Valve NWPS-AIR3 (16 N River) ☐
- Visual Inspection of Air Valve NWPS-AIR4 (406 S River) ☐
- Check odor control at Air Valve NWPS-AIR3 ☐
- Check odor control at Air Valve NWPS-AIR4 ☐
- Visual generator inspection/clean generator room ☐

Reset

Comments

Observation:

Repairs:

Recommendation:

2020 Televising Schedule

2020 Televising	January	February	March	April	May	June	July	August	September	October	November	December
MISCELLANEOUS O&M TV												
TV/ LAMP CUSTOMER SERVICE												
I&I Mainline and Lamping												
2021 Small Diameter Lining Sets N15, N28, N04, N01												
TV Warranty Large Diameter Lining from 2017 T04 Interceptor												
TV / CLEAN T09 Interceptor												
Dye Flooding												
Preflushing Investigations of Basins for 2021												

COLLECTION AND PUMPING LEVEL 1 MANHHOLE INSPECTIONS

General Information		
Project (10):	Work Order # (8):	CW Inspection #:
Surveyed by (1):	Date (11):	Time (12):
Weather (14):	Purpose of Survey (17):	
Inspection Level (19): Level 1	Inspection Status (19): Surface Inspection	
Manhole Information		
Legacy ID (22):	Street (23):	City (24):
Location Details (28):	Surface Type (26):	Inflow Potential from Runoff (27):
Comments (44):		
Component Observations		
Cover Condition (56):	Ring Type (59):	Ring Condition (61):
Frame Condition (68):	Chimney Condition (81):	Cone Condition (87):
Wall Condition (94):	Bench Condition (98):	Channel Condition (103):
Additional Information (106):		

Depth (ft)	Component	Code	Continuous Defect	Value	Joint	Step	Circumferential Location		Image Ref	Remarks
		Group Descriptor Modifier		% of cross sectional area lost			At/From	To		

Numbers in parentheses (14) reference NASSCO MACP Inspection form and section of guide

SECTION 300:
SANITARY SEWER
CONSTRUCTION STANDARDS

Page No.	Description
300-2	**301 GENERAL**
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300-2	301.2 SPECIFICATIONS
300-2	301.3 REGULATIONS
300-2	301.4 START OF CONSTRUCTION
300-2	301.5 UTILITY IDENTIFICATION
300-4	**302 MATERIALS**
300-4	302.1 MANHOLES
300-5	302.2 PIPE TO MANHOLE CONNECTOR
300-5	302.3 PIPES
300-7	302.4 CONNECTING DISSIMILAR PIPE MATERIALS
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300-12	303.6 BRANCH FITTINGS
300-13	**304 INSPECTION AND TESTING**
300-13	304.1 MANHOLES
300-13	304.2 FLEXIBLE PIPE
300-19	**390 STANDARD DETAILS**

301 GENERAL

The standards and requirements found in this article are for the materials and construction of sanitary sewers within the City of Naperville, Illinois.

301.1 SEWAGE COLLECTION AND TREATMENT

All sanitary sewage of domestic and other water borne wastes shall be collected and conveyed in a sanitary sewer pipe system to a point of discharge into an existing sanitary sewer system, City of Naperville interceptor, or sewage treatment plant. No sanitary sewage shall be allowed to enter any storm sewer system or discharge onto the ground or into receiving streams without first being treated in accordance with city, county, state and federal regulations.

301.2 SPECIFICATIONS

These specifications cover pipe for sanitary sewers and service connections, sewer fittings, manholes and all appurtenances normally used for sanitary sewer collection systems. Special considerations will be covered in the detailed plans and special provisions covering the proposed construction. Sanitary sewers shall be installed in accordance with the "Standard Specifications for Water and Sewer Main Construction in Illinois", latest edition, and applicable ordinances of the City of Naperville, except as modified herein.

301.3 REGULATIONS

Additional rules and regulations governing the construction of sanitary sewers in the City of Naperville are:

a) The Sewer Permit Ordinance

b) The Sewage and Wastewater Control Ordinance

c) The restrictions, policies, and instructions that may be adopted or issued by the City of Naperville

d) The Illinois Pollution Control Board Regulations

e) The Environmental Protection Act

301.4 START OF CONSTRUCTION

The contractor shall not begin construction until all required permits have been obtained. Copies of all permits obtained by outside agencies must be provided to the city prior to the start of construction.

301.5 UTILITY IDENTIFICATION

A wood stake (4 inch by 4 inch by 6 foot) stake with not less than the top 2 feet painted green shall be installed next to each sanitary sewer manhole, clean-out, and at the end of each sewer stub (termination at the end of the line). The 4 inch by 4 inch by 6 foot stake shall be maintained in a plumb position until City acceptance of the utility structures.

When newly poured curbs are installed, the contractor shall use a City approved stamp to indent the wet concrete with an "S" to identify the location of each sanitary manhole and sewer stub. The letter "S" shall be indented at the top of the curb 1-1/2 inches to two 2 inches in height and width at a depth of 3/8 inches.

In areas where new curbs are not present or if the developer and/or the contractor fail to indent the curbs as outlined above, the City will then require that identification symbols as approved by the City Engineer be cut into the curb.

302 MATERIALS

302.1 MANHOLES

Manholes for sanitary sewers shall have a minimum inside diameter of 48 inches and shall be constructed of precast concrete units in accordance with ASTM C478-05 (or latest edition) and Section 32 of the "Standard Specifications for Water and Sewer Main Construction in Illinois," and shall follow the City of Naperville sanitary sewer standards. All manholes shall be water-tight. All visible leaks shall be sealed in a manner acceptable to the City Engineer.

302.1.1 FRAME AND COVER

Manholes shall be furnished with a self-sealing frame and solid cover (Neenah Foundry R-1772, East Jordan Iron Works 1022-Z3, or equal approved by the City Engineer) with the word "Sanitary" imprinted on the cover in raised letters (see Naperville Standard Detail 390.03). All frames and lids shall meet or exceed AASHTO H-20 loading specifications. Frames shall be shop painted with asphaltic base paint.

Both the manhole frame and cover shall have machined horizontal and vertical bearing surfaces. Inverted manhole frames are not allowed.

Pick holes shall not create openings in the manhole cover.

302.1.2 WATER-TIGHTNESS

Bolt-down frames shall be used in areas subject to flooding and where indicated on the plans. Bolt-down frames and covers shall be Neenah Foundry R-1916-F, East Jordan Iron Works 1040 ZPT or equal approved by the City Engineer. Frames are to be bolted to cone and cover to frame using stainless steel anchor bolts.

A continuous layer of non-hardening, preformed bituminous mastic material, Conseal 102B or approved equal, shall be applied to each manhole barrel cone and top section to provide a watertight seal.

Rubber boots/seals must be used where pipes enter manholes. The internal connection shall be dressed up with non-shrink hydraulic cement. Hydraulic cement, mortar, and concrete must be of the strength and water-tightness quality as specified in the ASTM standards.

Lifting holes that extend through the wall of manhole shall not be allowed.

302.1.3 FRAME ADJUSTMENTS

Adjustments may be necessary to ensure that frames match the elevation of the surrounding pavement or ground surface. Preformed adjusting rings of the proper dimensions needed to mate the frame to the precast structure shall be used. No more than 12 inches of vertical adjustment may be made using the minimum practical number of individual rings.

All rings shall be High Density Polyethylene Plastic (HDPE), Recycled Rubber, High Density Expanding Polystyrene, Expanded Polypropylene (EPP), or other material as

approved by the City Engineer. Precast concrete rings, bricks, rocks, shims, or concrete blocks will not be allowed. Tapered adjusting rings shall be required when the frame will need to match the slope of the roadway.

A resilient, flexible, non-hardening, preformed bituminous mastic material, Conseal 102 B or approved equal, shall be used between the cone or top barrel section of the structure and the adjusting rings. A thick bead of non-hardening elastomeric joint sealant conforming to ASTM C-920, Type S, Grade NS, shall be applied between all individual rings, and between the adjusting rings and the frame. The sealant or mastic material shall be applied in such a manner that no surface water or ground water inflow can enter the structure. No dressing or tuckpointing mortar is allowed on rings.

Frame adjustments shall be completed in accordance with Sections 602 and 603 of Standard Specifications for Road and Bridge Construction, prepared by the Illinois Department of Transportation, latest edition, except as noted herein.

302.1.4 STEPS

Manhole steps on maximum 16 inch center shall be furnished with each manhole, securely anchored in place, true to vertical alignment, in accordance with the Naperville Standard Details. Steps shall be copolymer polypropylene reinforced with ½ inch A615/A615M-05a (or latest edition) Grade 60 steel reinforcement, meeting or exceeding ASTM C 478-05 (or latest edition) and OSHA standards.

302.2 PIPE TO MANHOLE CONNECTOR

A flexible pipe-to-manhole connector shall be used for the connection of the sanitary sewer to precast concrete manholes. The connector shall meet ASTM C923-02 and ASTM A167-99(2004), or latest edition, and be constructed of EPDM rubber with 304 or 316 series stainless steel connectors (KOR-N-SEAL by NPC, PSX by Press-Seal Gasket Corporation, or approved equal).

302.3 PIPES

All sanitary sewer pipe materials shall conform to the latest applicable ANSI, ASTM, AWWA, AASHTO, or other nationally accepted standards. Only the following sanitary sewer pipe and joint materials are approved for use in the City of Naperville, Illinois:

a) Class 50 ductile iron pipe conforming to ANSI/AWWA C151/A.21.51-02 (or latest edition) with joints conforming to ANSI/AWWA C111/A.21.11-00 (or latest edition). Ductile shall be encased in polyethylene encasement in accordance with ANSI/AWWA C105/A21.5-99 (or latest edition).

b) Polyvinyl chloride (PVC) pipe (6 inch -16 inch) conforming to ASTM D2241-05 (or latest edition) (SDR 26 – sewer depth between 4-20 feet and SDR 21 for depths between 20-25 feet) with joints conforming to ASTM D3139-98 (2005) or latest edition.

c) Also acceptable in lieu of ASTM D2241-05 are C900 (SDR 18) for 12 inch diameter sewers and C905 (SDR 25) for 14 inch through 18 inch sewers.

302.3.1 PVC PIPE

This specification is appropriate for PVC pipe (6 inch - 16 inch) complying with ASTM D2241-05 and ASTM D3139-98 (2005) or latest edition. Any proposed PVC pipe greater than 16 inches in size must be approved by City Engineer prior to use. PVC pipe cannot be used in Class V soils (i.e. organic silt, organic clay and peat) as defined according to the Unified Soil Classification System in ASTM D2487-00 (or latest edition). Solvent cement joints will not be allowed in the City of Naperville.

Pipe shall be clearly marked as follows at intervals of 5 feet or less:

a) Manufacture's name or trademark and code

b) Nominal pipe size

c) The PVC cell classification, for example 12454-B

d) The legend "Type IPS SDR-26 PVC 1120 Sewer Pipe"

e) This designation "Specification D-2241"

PVC Pipe shall be SDR 26. For sewer depths between 20 and 25 feet, SDR 21 shall be provided. Higher SDR numbers will only be allowed with the approval of the City Engineer.

302.3.2 PVC FITTINGS

All PVC fittings shall comply with ASTM F1970-05 (or latest edition) and fittings shall be clearly marked as follows:

a) Manufacturer's name or trademark

b) Nominal size

c) The material designation PVC or IPS (iron pipe size), and this designation “Specification D2241”

Fitting shall be molded for pipe sizes between 6 inches and 8 inches in diameter, and fabricated fittings for 10” to 16” in diameter. A minimum of 150 psi pressure class shall be provided.

PVC fittings shall be SDR 26. Higher SDR numbers will only be allowed with the approval of the City Engineer. Fittings shall be required to pass the same inspection and testing requirements of the PVC pipe.

302.4 CONNECTING DISSIMILAR PIPE MATERIALS
Joints connecting dissimilar pipe materials shall be made with sewer clamp non-shear type couplings; Cascade CSS, Romac LSS, Fernco, Inc. Shear Ring, or approved equal. When available, a standard joint with a transition gasket may be used. The name of the manufacturer, class, and date of issue shall be clearly identified on all sections of pipe. The contractor shall also submit bills of lading, or other quality assurance documentation when requested by the City Engineer.

302.5 CASING PIPES
All steel casing pipe shall be bituminous coated, a minimum of 30 mils thickness inside and out, shall be of leak proof construction and capable of withstanding the anticipated loadings. The minimum wall thickness for the casing pipe shall be in accordance with Table 300-1. The steel casing pipe shall have minimum yield strength of 35,000 psi and shall meet the requirements of A139/A139M-04 (or latest edition), Grade B. Ring deflection shall not exceed 2% of the nominal diameter. The steel casing pipe shall be delivered to the jobsite with beveled ends to facilitate field welding

TABLE 300-1
REQUIRED CASING PIPE WALL THICKNESS

Steel Casing Diameter	Minimum Wall Thickness (Inches)
20”- 22”	0.344
24”	0.375
28”	0.438
30”	0.469
32”	0.501
34”- 36”	0.532

302.6 BEDDING, HAUNCHING AND INITIAL BACKFILL
The material used for pipe bedding, haunching and initial backfill shall consist of gravel, crushed gravel, or crushed stone conforming to the requirements of Article 1004.01 of the "Standard Specifications for Road and Bridge Construction", prepared by the Illinois Department of Transportation. The gradation shall conform to gradation CA-7 or CA-11 of the Standard Specifications.

302.7 SELECTED GRANULAR BACKFILL
Selected granular backfill, or trench backfill, shall consist of gravel, crushed gravel, or crushed stone conforming to the requirements of Article 1004.01 of the "Standard Specifications for Road and Bridge Construction", prepared by the Illinois Department of Transportation. The gradation shall conform to gradation CA-6 of the Standard Specifications.

303 CONSTRUCTION REQUIREMENTS

303.1 GENERAL REQUIREMENTS

303.1.1 RESPONSIBILITY FOR MATERIALS

The contractor shall be responsible for the acceptability and storage of all materials furnished by him and shall assume responsibility for the replacement of all such material found damaged in shipping or on job site or defective in manufacture. This shall include the furnishing of all material and labor required for the replacement of installed material discovered to be defective prior to the final acceptance of the work.

303.1.2 STORAGE OF PIPING MATERIALS

The interior, as well as all sealing surfaces of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter. Store pipe bundles on flat surfaces with uniform support. Pipe stored outside and exposed to prolonged periods of sunlight should be covered with canvas or other opaque material. Clear plastic sheets shall not be used. Air circulation shall be provided under covering. Keep gaskets away from oil, grease, electric motors (which produce ozone), excessive heat and direct rays of the sun. Consult the manufacturer for specific storage recommendations.

303.1.3 HANDLING OF PIPING MATERIALS

Piping materials shall be unloaded, hauled and distributed at the site of the project by the contractor. Materials shall at all times be handled properly to prevent damage in accordance with manufacturer's recommendations. Pipe and fittings shall not be thrown, dropped, or dragged. Damaged or defective material on the job site shall be rejected and replaced to the satisfaction of the City Engineer. Methods of construction conducive to the damage of sewer pipe shall be corrected when called to the attention of the contractor. All pipe and fittings shall be examined by the contractor above grade before placement in the trench.

303.2 MANHOLES

303.2.1 PIPE CONNECTIONS

Where a connection is made to an existing manhole, the manhole shall be cored, and a flexible pipe-to-manhole connector installed. The existing manhole bench shall be reworked as required by City Engineer.

Inverts shall be made to conform accurately to the sewer grades with smooth, well rounded junctions and transitions satisfactory to the City Engineer. If the invert is to be poured in place, the sanitary sewer pipe shall be extended through the manhole, the concrete poured and formed, and the pipe then sawed out through the manhole.

303.3 TRENCHING

Trench construction shall be done in accordance with Sections 20 and 31 of the Standard Specifications for Water and Sewer Main Construction in Illinois, except as modified herein.

303.3.1 WIDE TRENCH

Wide trenches are classified as trenches whose width at the top of the pipe is greater than 2 1/2 pipe diameters on each side of the pipe or a total of 6 pipe diameters. Although there is no width of trench beyond which the load on a flexible pipe exceeds the prism load, accepted installation practices usually dictate narrow trench construction. In isolated circumstances it may be more cost effective to use wide trench construction, i.e., in areas where narrow trench walls cannot be maintained. If trench width at the top of a small diameter pipe (4 inch - 10 inch diameter) must exceed 6 pipe diameters, the embedment up to the pipe spring line should be compacted to a point approximately 2 1/2 pipe diameters from each side of the pipe. For large diameter PVC pipe (12 inch - 48 inch diameter) installed in wide trenches, the embedment up to the pipe spring line should be compacted to a point at least one pipe diameter or 2 feet from side of the pipe, whichever is greater.

303.3.2 ROCK SUB-GRADE

Ledge rock, hard pan, cobbles, boulders or stones larger than 1 1/2 inches shall be removed from the trench bottom to permit a minimum bedding thickness of 6 inches.

303.4 PIPE BEDDING AND BACKFILL

Granular pipe bedding and haunching shall be required on all sanitary sewers installed in the City of Naperville. Initial backfill shall be required for all sanitary sewers constructed of PVC or other flexible pipe material.

303.4.1 PIPE BEDDING

Granular pipe bedding shall be provided so that the pipe will be uniformly supported and the entire length of the pipe barrel will have full bearing. No blocking of any kind shall be used to adjust the pipe to grade except when used with embedment concrete. Bedding shall be required for all sewer construction, and shall be of a thickness equal to 1/4 of the outside diameter of the sewer pipe with a maximum thickness of eight inches. Granular pipe bedding shall be a minimum of 4 inches in earth excavation and a minimum of 6 inches in rock excavation.

Where unsuitable material is encountered at the grade established, all such unsuitable soil shall be removed under the pipe and for the width of the trench, and shall be replaced with well compacted bedding material. The size range and resulting high voids ratio of bedding material make it suitable for use to dewater trenches during pipe installation. This permeable characteristic dictates that its use be limited to locations where pipe support will not be lost by migration of fine grained natural material from the trench walls and bottom or migration of other materials into the bedding material. When such migration is possible, the material's minimum size range should be reduced to finer than 1/4 inch and the gradation properly designed to limit the size of the voids.

Bedding materials shall be placed to provide uniform and adequate longitudinal support under the pipe. Bell holes at each joint shall be provided to permit the joint to be assembled properly while maintaining uniform pipe support. When the joint has been made, the void under the bell will be filled with bedding or haunching material.

303.4.2 HAUNCHING
The most important factor affecting pipe performance and deflection is the haunching material and its density. Place and consolidate the material under the pipe haunch to provide adequate side support to the pipe while avoiding both vertical and lateral displacement of the pipe from proper alignment. Place haunching up to the pipe spring line.

303.4.3 INITIAL BACKFILL FOR FLEXIBLE PIPE
Initial backfill begins above the spring line of the pipe and extends to a point 6 inches above the top of the pipe. This material shall be carefully placed so as to completely fill the space around the pipe, in 8 inch layers, loose measurements, and compacted to the satisfaction of the City Engineer.

303.4.4 SELECTED GRANULAR BACKFILL (TRENCH BACKFILL)
The backfill for trenches and excavation made in existing or under proposed pavements where the inner edge of the trench is within 2 feet of the edge of the pavement, curb, gutter, curb and gutter, or sidewalk, shall be made with compacted selected granular material. Selected granular backfill shall be placed in uniform layers not exceeding 6 inches (loose measure) and compacted with mechanical equipment to 95% of the standard proctor density in accordance with the applicable AASHTO or ASTM requirements.

303.4.5 DEPTH OF PIPE COVER
All pipe shall be laid to a minimum depth of 7 feet measured from the proposed ground surface to the top of the pipe, unless specifically allowed otherwise in special circumstances by the City Engineer. If allowed, sanitary sewer and services with ground cover less than 4 feet or more than 25 feet must be constructed of ductile iron class 50 pipe. PVC pipe installed for sewer depths between 20-25 feet shall have a SDR 21 rating. All sanitary sewers and services with less than 4 feet of cover shall have insulation.

303.5 PIPE INSTALLATION

303.5.1 LAYING OF PIPE
Sanitary sewer pipe shall be laid true to line and grade as set forth in Section 31 paragraph 31-1.02 of the "Standard Specifications for Water and Sewer Main Construction in Illinois." Dirt and other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations.

Any pipe or fitting that has been installed with dirt or foreign material in it shall be cleaned and re-inspected. At times when pipe laying is not in progress, and at the end of each working day, the open end of the pipe shall be closed with a water tight plug to ensure absolute cleanliness inside the pipe. The City Engineer may request mechanical cleaning (jet flushing) and/or televising if necessary to ensure clean, acceptable pipes, at the contractor's expense.

303.5.2 LAYING OF PIPE ON CURVES

The curvature of sanitary sewers is allowed for sewers 8 inches to 12 inches in diameter. Alignments must follow the general alignment of streets. Only a simple curve design is acceptable. The minimum allowable radius of curvature is 300 feet. Compression type pipe joints are required and manholes are required at the beginning and end of all curves. Maximum joint deflection shall not exceed the manufacturer's recommendations.

303.5.3 INSTALLING PIPE THROUGH CASINGS

This work shall be in conformance with Section 20-2.19 of the Standard Specifications for Water and Sewer Main Construction in Illinois, except as modified herein. Encasements for pipes under highways or railroads shall conform to the requirements of the City of Naperville, or the owner of the highway or railroad. Manufactured non-metallic or non-corrosive casing spacers, adjustable runners, or cradles shall be used to support the pipe in the casing and shall be installed per manufacturer's recommendations. A minimum of two supports shall be used per joint of pipe for lengths up to 12.5 feet, and a minimum of three supports shall be used per joint for lengths greater than 12.5 feet. The annular space shall be filled with pea gravel, low-strength grout, or cellular foam concrete and provisions shall be made so that no voids are left. Contractor shall make arrangements to have a City of Naperville representative witness the annular spacing filling operations.

303.5.4 CUTTING AND BEVELING PIPE

For shorter than standard pipe lengths, field cuts may be made with either hand or mechanical saws or plastic pipe cutters. Ends shall be cut square and perpendicular to the pipe axis. Spigots shall have burrs removed and ends smoothly beveled by a mechanical bevel or by hand with a rasp or file. Field spigots shall be stop-marked with felt tip marker or wax crayon for the proper length of assembly insertion. The angle and depth of field bevels and lengths to stop-marks shall be comparable to factory pipe spigots.

303.5.5 ASSEMBLY OF JOINTS

Assemble all joints in accordance with recommendations of the manufacturer. If a lubricant is required to facilitate assembly it shall have no detrimental effect on the gasket or on the pipe when subjected to prolonged exposure. Proper jointing may be verified by rotation of the spigot by hand or with a strap wrench. If unusual joining resistance is encountered or if the insertion mark does not reach the flush position, dissemble the joint, inspect for damage, re-clean the joint components and repeat the assembly steps. Note that fitting bells may permit less insertion depth than pipe bells (NOTE: When mechanical equipment is used to assemble joints, care should be taken to prevent over insertion.)

303.5.6 BUILDING SERVICES

When main line bedding, haunching, initial and final backfill must be disturbed to install fittings and service lines, the contractor is directly responsible to ensure that the bedding, haunching, initial and final backfill with appropriate compaction are restored properly to eliminate the possibility of deflection or movement causing future pipe failure.

303.5.7 PIPE CAPS AND PLUGS

All caps and plugs shall be braced, staked, anchored, wired or otherwise secured to the pipe to prevent leakage under the maximum anticipated thrust from internal abnormal operating conditions or test pressures from water or air.

303.6 BRANCH FITTINGS

Fittings for service branches in new construction shall be molded for 6 inch and 8 inch pipe and fabricated for 10 inch to 16 inch diameter with all gasketed connections. Clay/plastic pipe connections must be watertight. The contractor will be permitted to use fittings which include factory molded saddles and tees with alignment rings, and factory molded wyes. When connecting to an existing sewer main by means other than an existing wye or tee, one of the following methods shall be used:

a) For PVC existing lines only, a sewer tap into the existing main shall be allowed. This would include a circular saw-cut of the sewer main by proper tools ("Shewer Tap" machine or similar) and proper installation of hub-wye saddle or hub-tee saddle. Holes for wye saddles shall be laid out with a template and shall be de-burred and carefully beveled where required to provide a smooth hole shaped to conform to the fitting.

b) A typical connection would involve a PVC "T" fitting, another 1' (or more) extension of PVC pipe, depending on location of existing joint, the non-shear coupling and the existing clay or PVC pipe. With pipe cutter or appropriate equipment, neatly and accurately cut out desired length of pipe for insertion of proper fitting, using non-shear reinforced banded style repair coupling with 300 series stainless steel shear ring as manufactured Fernco, Inc. or Mission Rubber Company, Inc., or approved equal, connect the sewer pipes and maintain matching flow line elevations. All couplings shall bear the manufacturer's identifying mark and size.

The contractor shall provide details of direct connections to City interceptors greater than 18 inches in diameter and show construction procedure for protecting City structures.

All proposed bypass pumping of sanitary flow shall be approved by Department of Public Utilities prior to performing this work.

390 STANDARD DETAILS

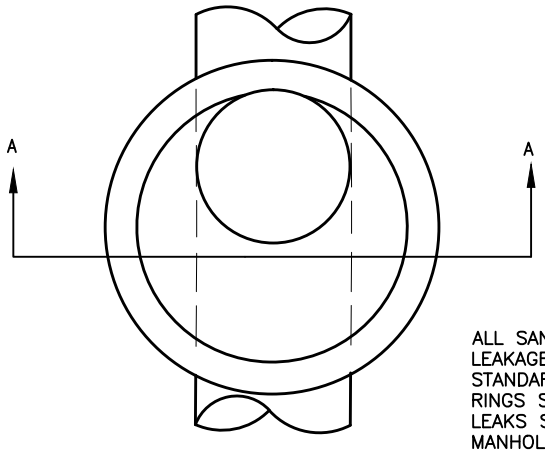
390.01 Sanitary Sewer Manhole
390.02 Sanitary Manhole – Exterior Drop Connection
390.03 Sanitary Manhole – Interior Drop Connection
390.04 Sanitary Manhole – Drop Connection to Ex. Manhole
390.05 Sanitary Manhole – Dog House Connection
390.06 Sanitary Manhole - Frame and Cover

390.10 Trench Section for PVC Pipe

390.20 Riser for Service Lateral
390.21 Sanitary Sewer Service Connection
390.22 Sanitary Sewer Pipe Insulation

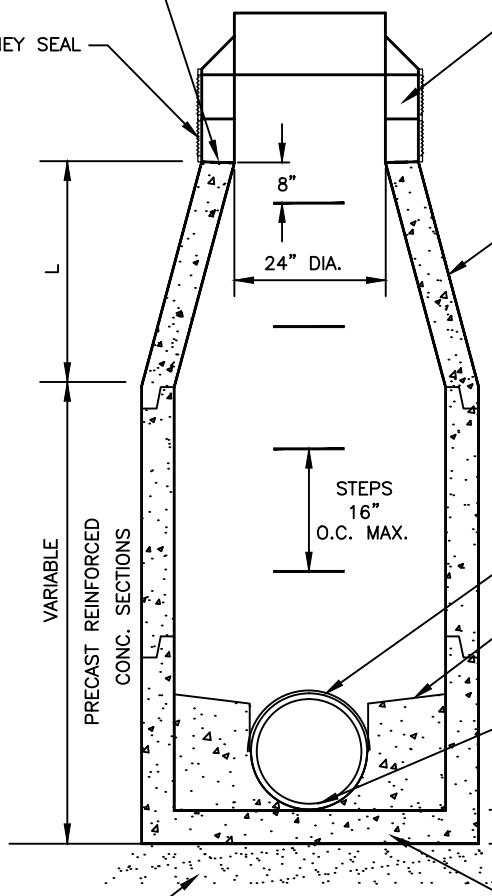
390.99 COMMON NAMES
All standard details in this section may be referred to by a common name in associated construction documents. The common name shall be "SANITARY xx" where the xx is the section of the detail number to the right of the decimal point. For instance, *Detail #390.01 Sanitary Sewer Manhole* may also be referred to as "SANITARY 1".

Inside MANHOLE. DIAMETER.	48"	60"
Pipe DIAMETER.	≤21"	>21"
Wall Thickness	5"	6"
Ecc. Cone Sec.(L)	2'-6"	3'-9"
MANHOLE DEPTH	≤12'	>12'
t	8"	10"



PLAN

ALL SANITARY MANHOLES SHALL BE TESTED FOR LEAKAGE BY VACUUM TESTING PER CITY STANDARDS. THE MANHOLE FRAME AND ADJUSTING RINGS SHALL BE IN PLACE WHEN TESTING. ANY LEAKS SHALL BE REPAIRED FROM EXTERIOR OF MANHOLE – PATCHING INSIDE OF MANHOLE SHALL NOT BE ACCEPTABLE.



SECTION A-A

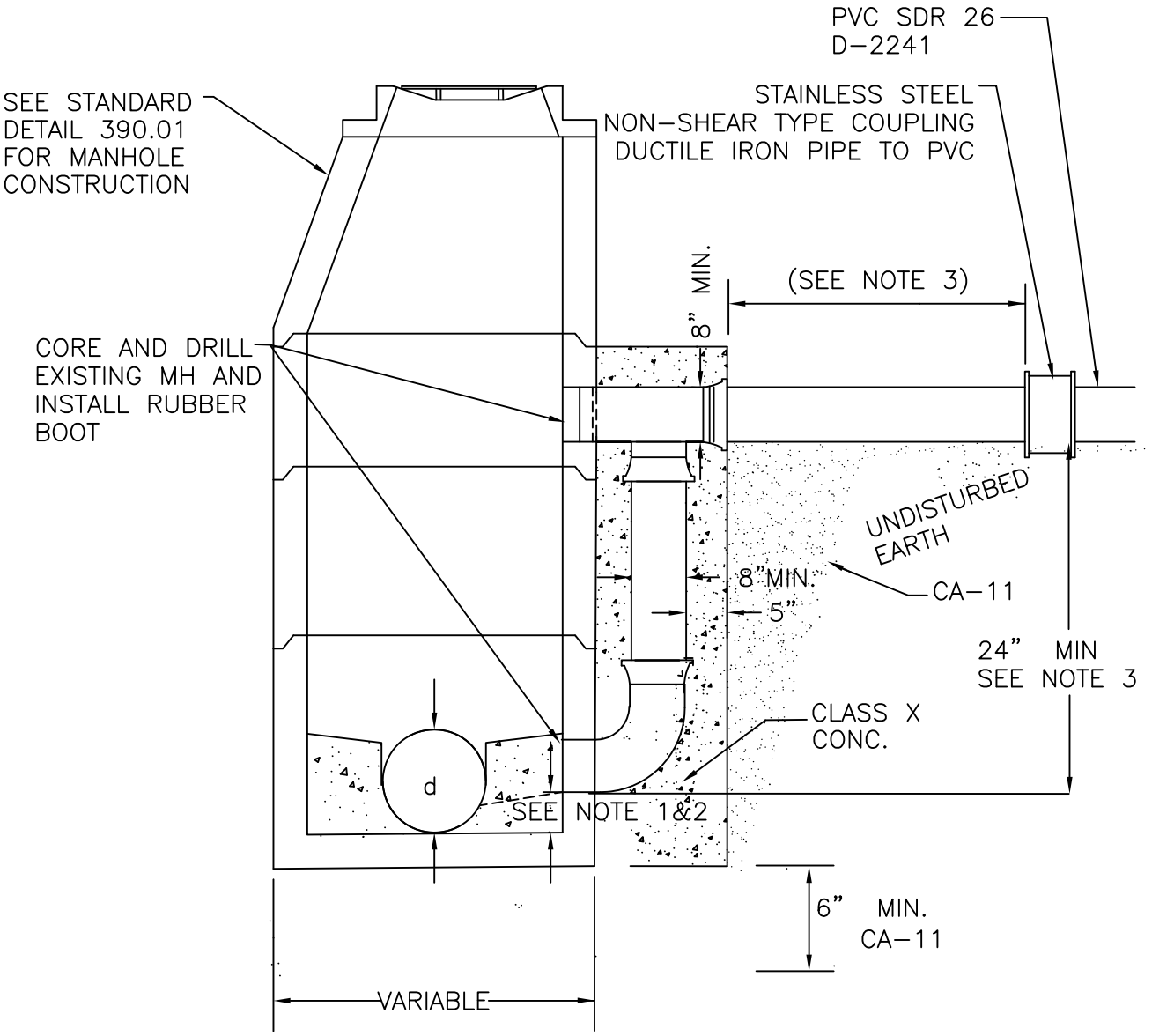
City of Naperville
STANDARD DETAIL

SANITARY SEWER MANHOLE

REVISED: 08/01/2018 | SHEET 1 OF 1

SANITARY 1

390.01

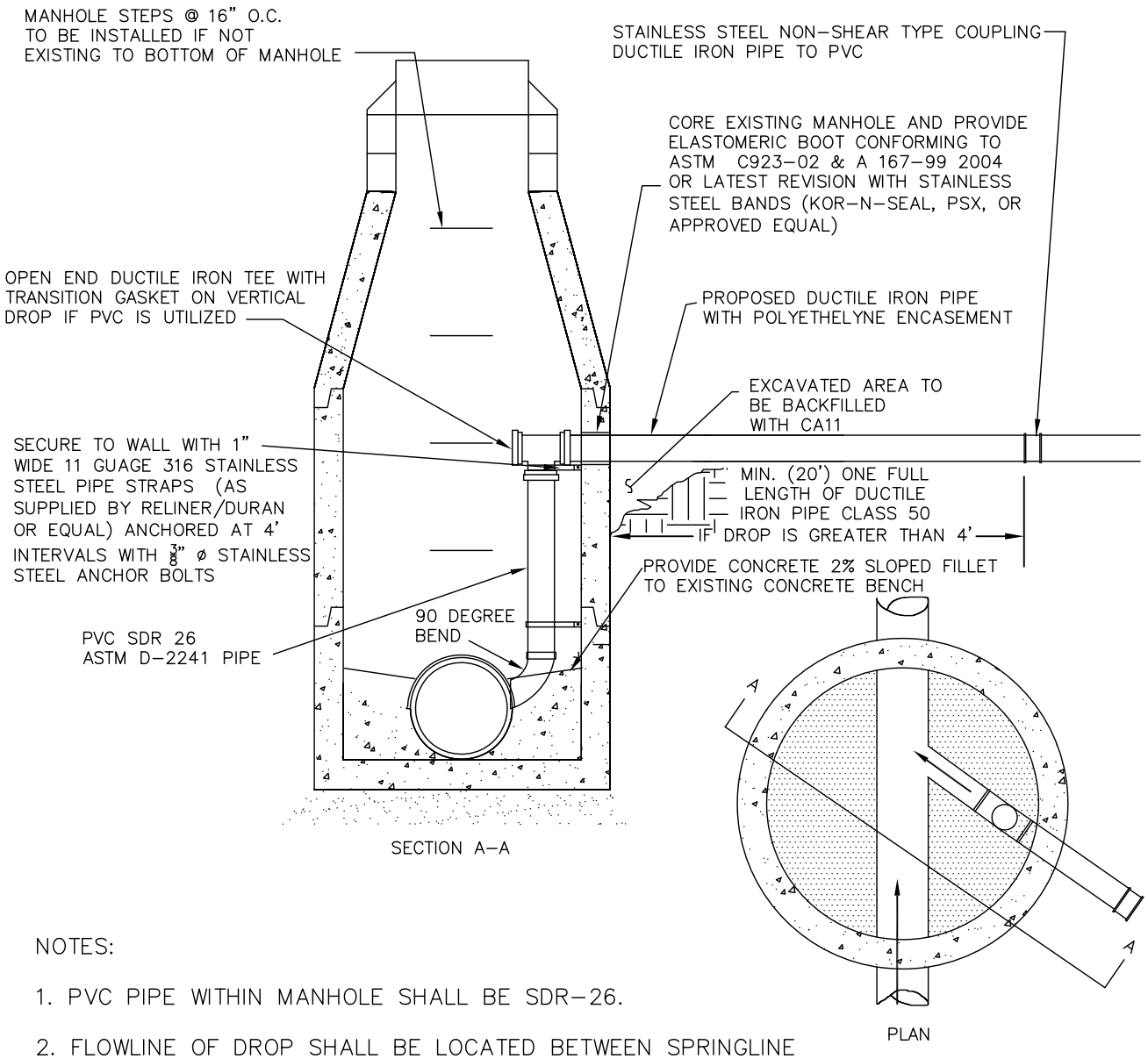


1. NOTE DROP INVERT TO BE $\frac{1}{4}$d TO $\frac{1}{2}$d
   d= DIAMETER OF LOWER EXISTING PIPE

2. CONCRETE BENCH TO PROVIDE SMOOTH TRANSITION

3. PVC SDR 26, ASTM 2241 MAY BE USED FOR DROPS 2' TO 4'; FOR DROPS GREATER THAN 4' USE DUCTILE IRON PIPE SCH 50 MIN ONE FULL LENGTH.

City of Naperville **STANDARD DETAIL**	**SANITARY MANHOLE - EXTERIOR DROP CONNECTION** REVISED: 01/01/2013 — SHEET 1 OF 1	SANITARY 2 **390.02**



NOTES:

1. PVC PIPE WITHIN MANHOLE SHALL BE SDR-26.

2. FLOWLINE OF DROP SHALL BE LOCATED BETWEEN SPRINGLINE AND TOP OF SEWER MAIN.

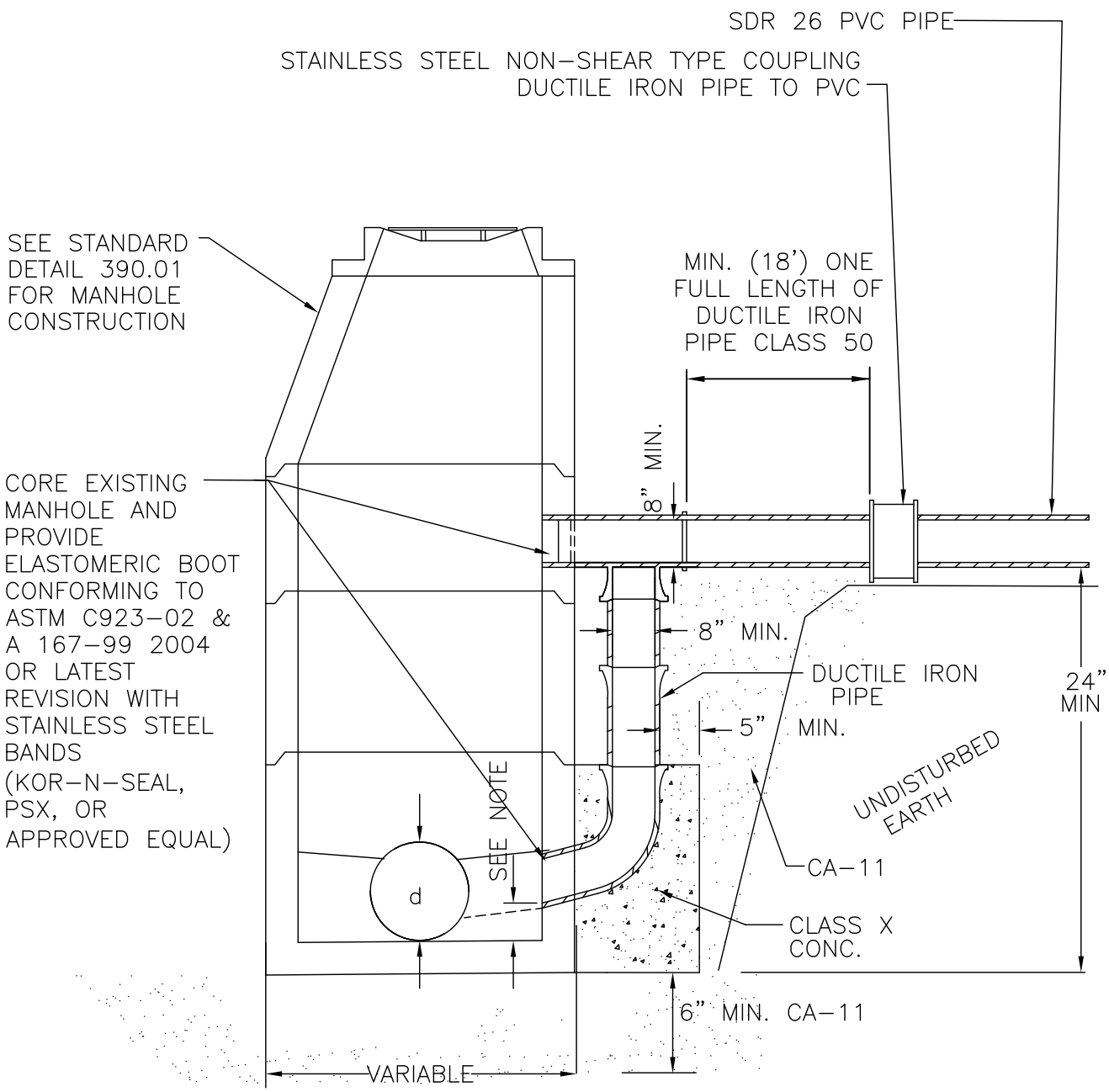
3. EXISTING FLOW THROUGH MANHOLE SHALL BE UNOBSTRUCTED DURING CONSTRUCTION OR BYPASS PUMPED PER CITY APPROVAL.

4. ALL HARDWARE WITHIN MANHOLE SHALL BE 316 STAINLESS STEEL

5. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF NAPERVILLE DESIGN STANDARDS. INTERIOR DROP AND PROPOSED ELEVATIONS MUST BE APPROVED BY DEPARTMENT OF PUBLIC UTILITIES.

6. FLEXIBLE COUPLING CONNECTING DUCTILE IRON. PIPE TO PVC PIPE SHALL BE A SHEAR RING TYPE COUPLING AS MANUFACTURED BY FERNCO, SERIES 1056R OR APPROVED EQUAL.

City of Naperville **STANDARD DETAIL**	**SANITARY MANHOLE - INTERIOR DROP CONNECTION** REVISED: 01/01/2013 — SHEET 1 OF 1	SANITARY 3 **390.03**



NOTE:

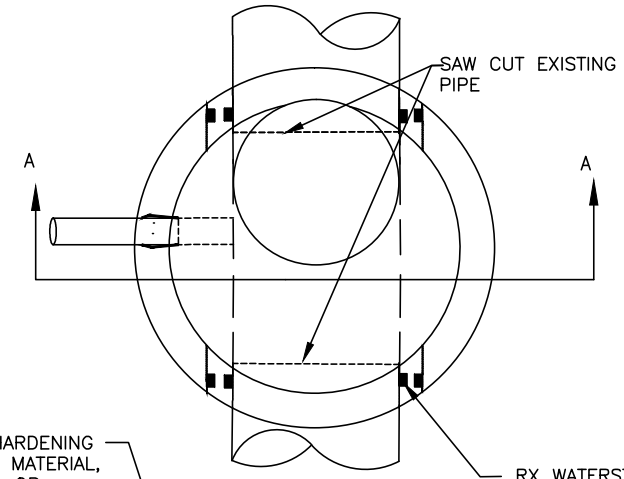
1. INVERT OF DROP CONNECTION TO BE 1/4 TO 1/2 OF "d" UNLESS OTHERWISE NOTED ON PLANS (d= DIAMETER OF LOWER EXISTING PIPE)

2. EXISTING CONCRETE BENCH REWORKED TO PROVIDE SMOOTH TRANSITION.

3. ALL DUCTILE IRON PIPE TO BE CONCRETE ENCASED.

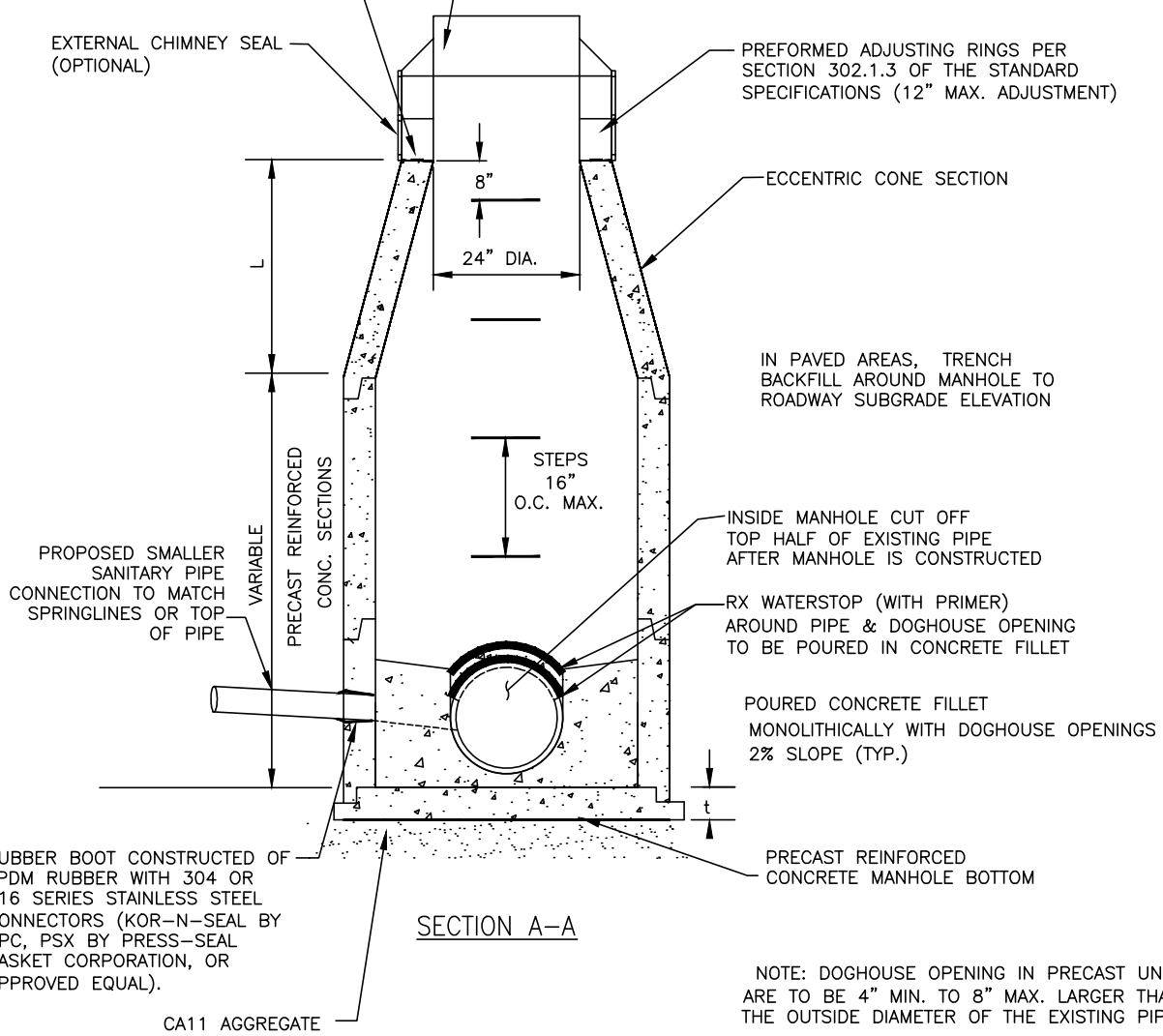
City of Naperville **STANDARD DETAIL**	**SANITARY MANHOLE - DROP CONNECTION TO EX MANHOLE** REVISED: 01/01/2013 | SHEET 1 OF 1	SANITARY 4 **390.04**

INSIDE MANHOLE. DIAMETER.	48"	60"
PIPE DIAMETER.	≤21"	>21"
WALL THICKNESS	5"	6"
ECC. CONE SEC.(L)	2'-6"	3'-9"
MANHOLE DEPTH	≤12'	>12'
T	8"	10"



PLAN

RX WATERSTOP OR APPROVED EQUAL INSTALLED PER MANUFACTURERS RECOMMENDATIONS. (ONLY ONE SIDE SHOWN FOR CLARITY.)



SECTION A-A

NOTE: DOGHOUSE OPENING IN PRECAST UNIT ARE TO BE 4" MIN. TO 8" MAX. LARGER THAN THE OUTSIDE DIAMETER OF THE EXISTING PIPE.

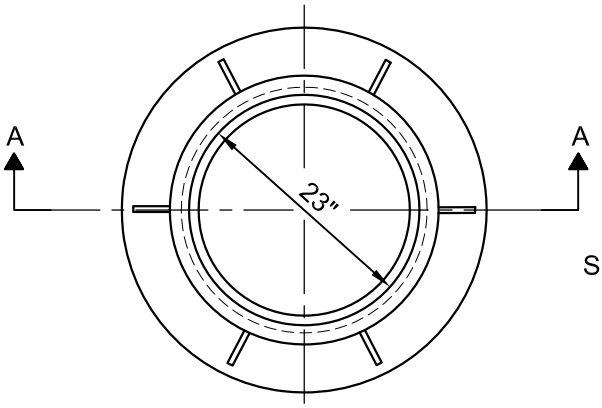
City of Naperville
STANDARD DETAIL

SANITARY MANHOLE - DOG HOUSE CONNECTION

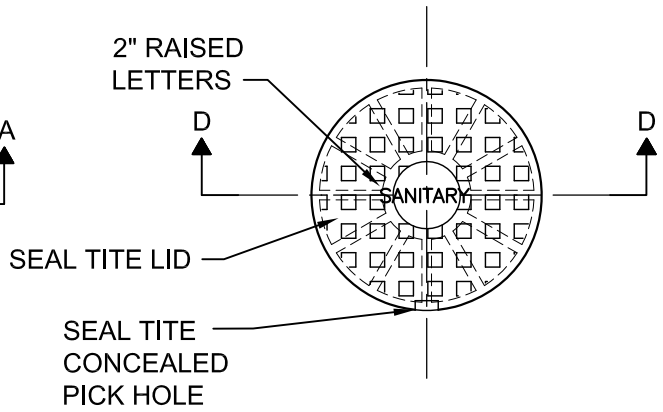
REVISED: 08/01/2018 | SHEET 1 OF 1

SANITARY 5

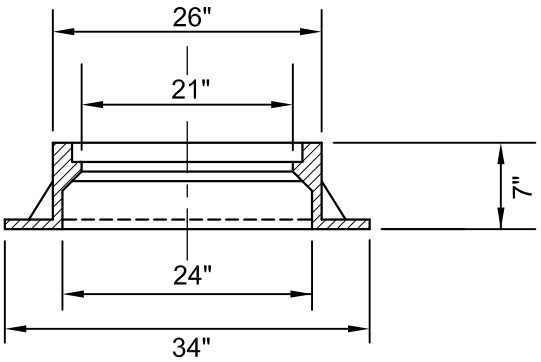
390.05



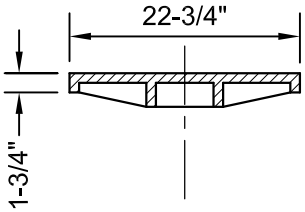
CAST FRAME



CAST CLOSED LID



SECTION A-A



SECTION D-D

NOTES:

1) DUCTILE IRON SHALL BE GRADE 65-45-12 AND SHALL BE TESTED IN ACCORDANCE WITH FEDERAL SPECIFICATIONS.

2) ALL FRAMES AND COVERS SHALL HAVE MACHINED HORIZONTAL AND VERTICAL BEARING SURFACES. PICK HOLES SHALL NOT CREATE OPENINGS IN THE COVER.

3) THE MANHOLE COVERS SHALL HAVE 2" RAISED LETTERS AS SHOWN.

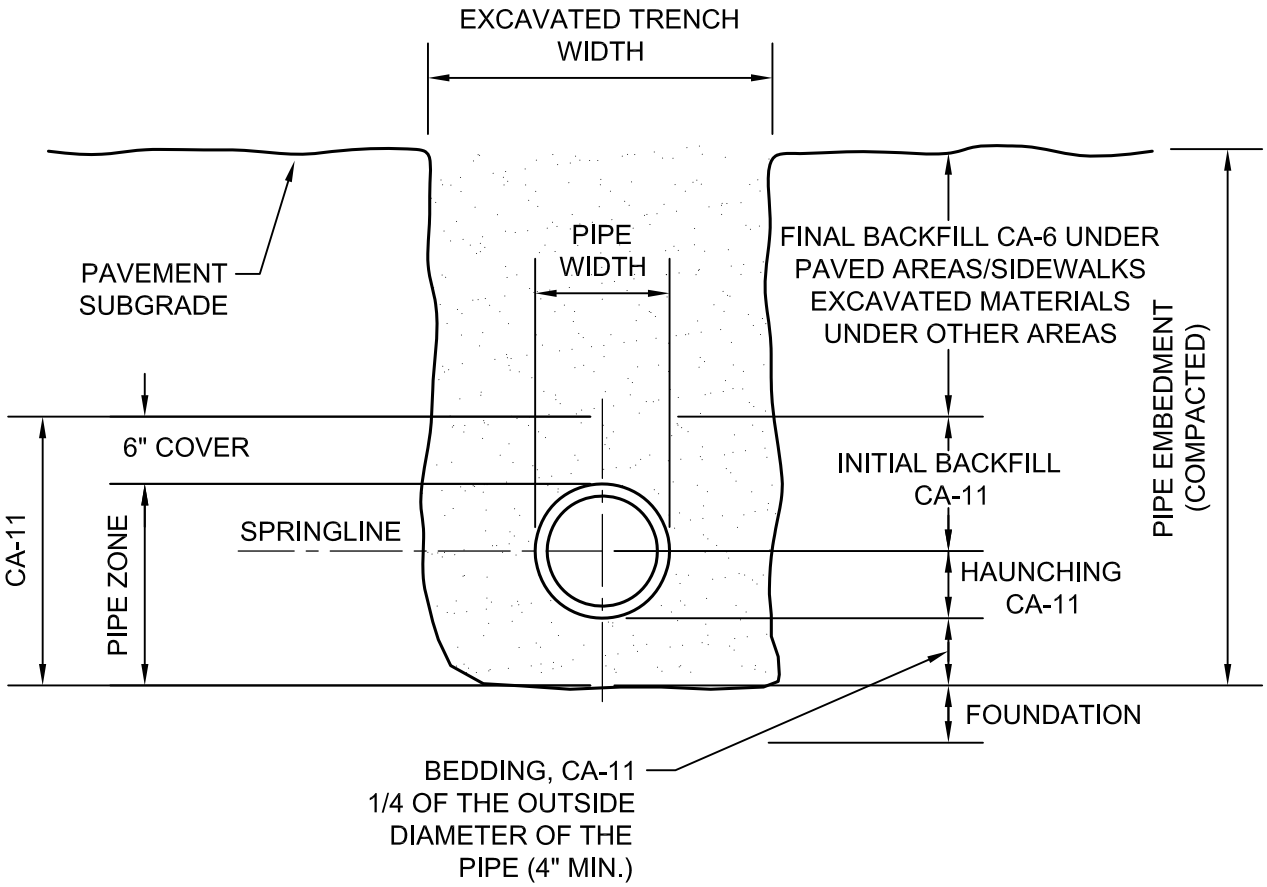
4) ALTERNATIVE TO DUCTILE IRON LID, GREY IRON CL 35 LID MAY BE USED.

5) CASTINGS ARE SHALL BE EAST JORDAN 1022-Z3; NEENAH R-1772 OR APPROVED EQUAL.

6) WATERPROOF, BOLTDOWN FRAME AND COVER SHALL BE USED IN FLOOD PLAIN AREA, AND AS NOTED ON THE PLANS. NEENAH R-1916-F1, EAST JORDAN IRON WORKS 1022-Z1PT OR APPROVED EQUAL.

7. LIDS AND FRAMES TO MEET ASSHTO M306 PROOF LOADING SPECIFICATIONS

City of Naperville STANDARD DETAIL	SANITARY MANHOLE - FRAME & COVER	SANITARY 6
	REVISED: 01/01/2013 / SHEET 1 OF 1	390.06

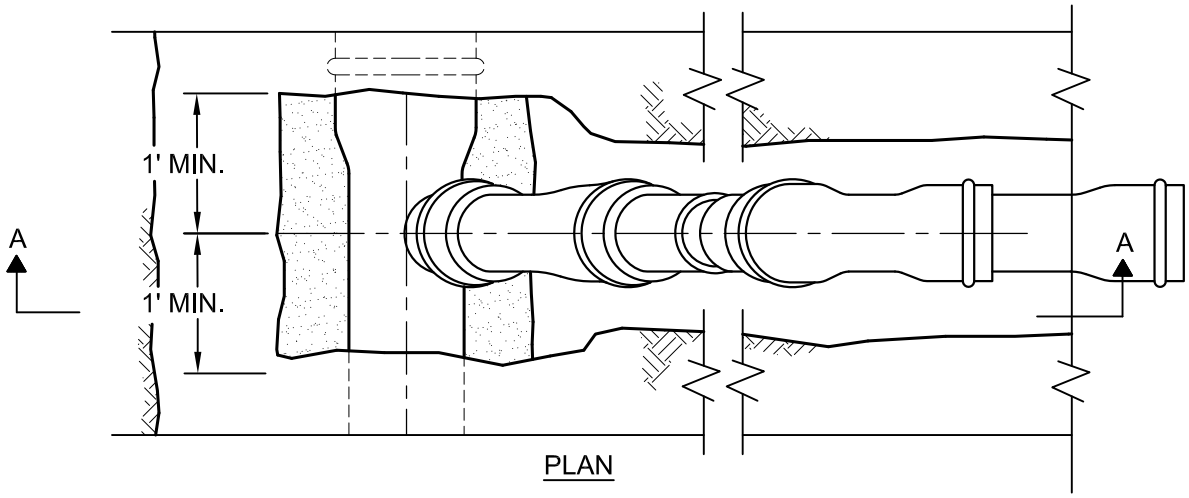


NOTES:

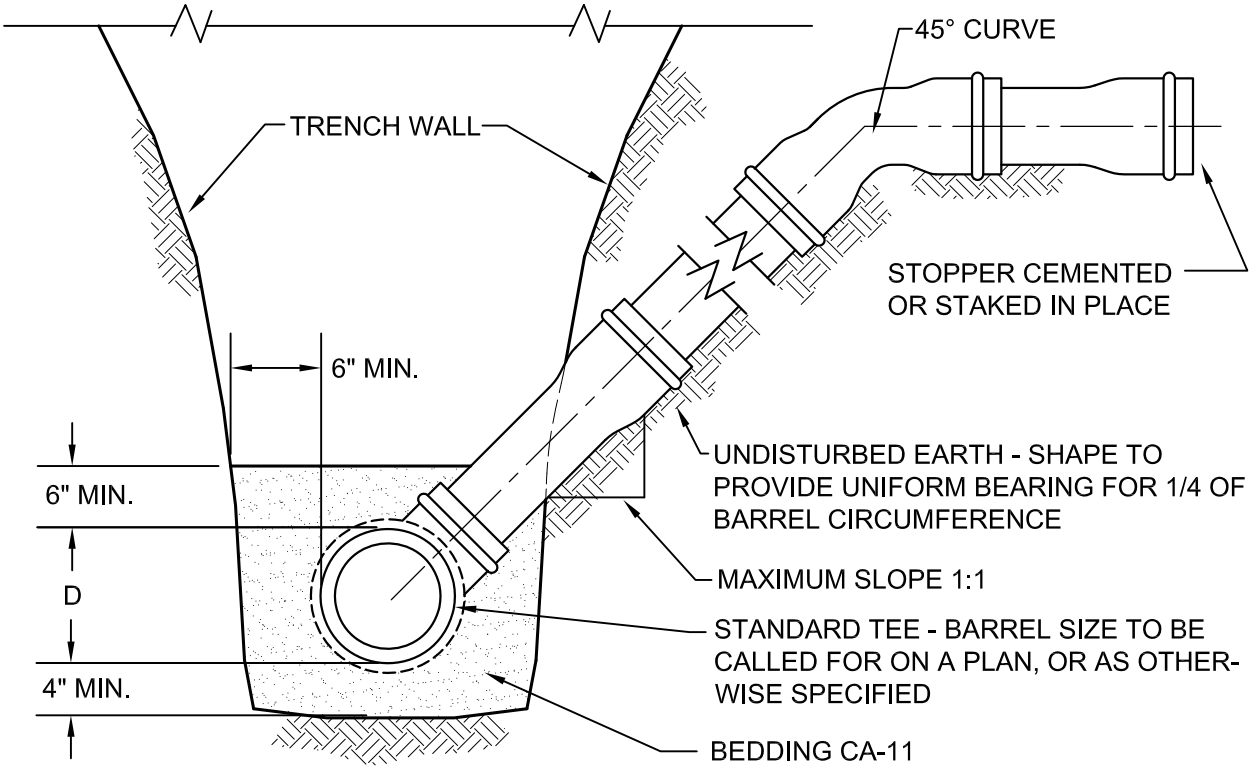
1. IN PAVED AREAS, ALL TRENCHES MUST BE COMPACTED IN CONFORMANCE WITH SECTION 550.07 OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.

2. IF FOUNDATION IS UNSUITABLE TO BED PIPE, UNDERCUTS MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

City of Naperville STANDARD DETAIL	TRENCH SECTION FOR PVC PIPE	SANITARY 10 390.10
	REVISED: 01/01/2013 — SHEET 1 OF 1	



PLAN



SECTION A-A

1. THE OPEN ENDS SHALL BE PROTECTED FROM DEBRIS AND GROUNDWATER ENTERING THE LATERAL WITH AN APPROVED PLUG.

2. MAXIMUM SLOPE SHALL BE LESS THAN 1:1 WHEN IT IS NECESSARY TO SECURE BEDDING IN UNDISTURBED EARTH.

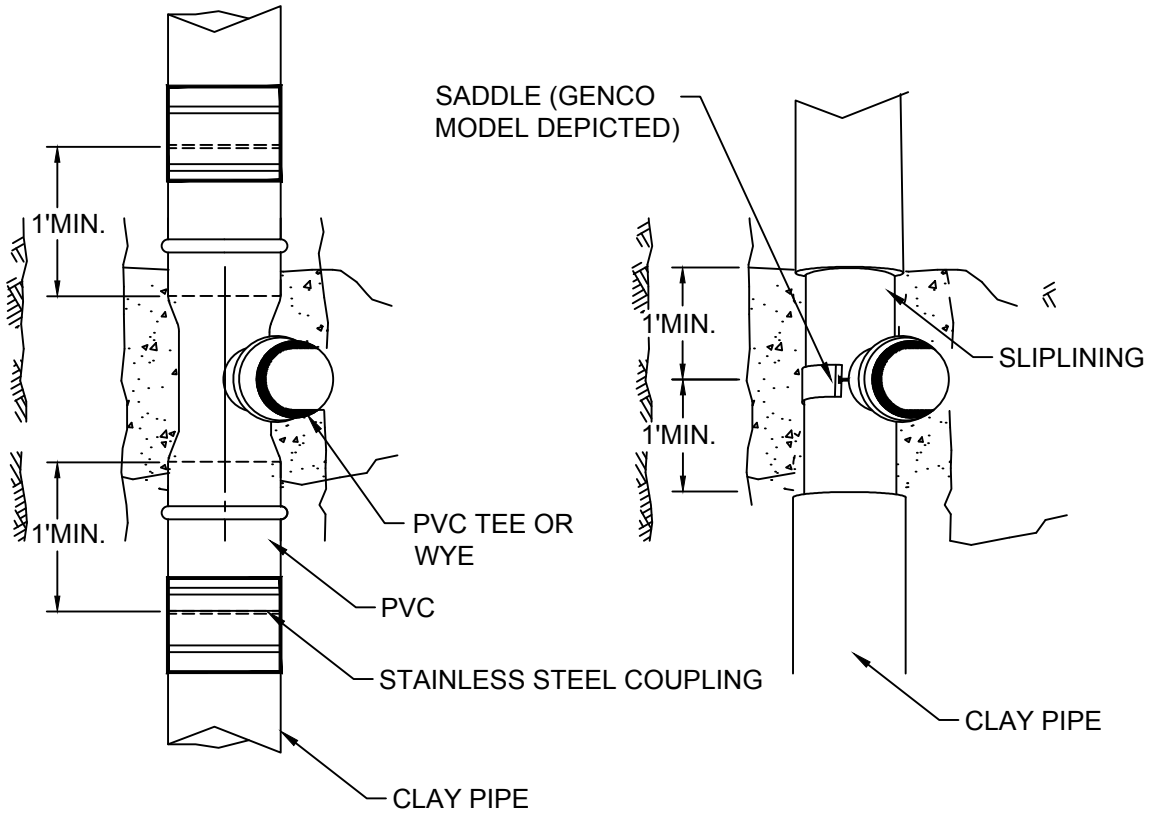
3. WHEN A SERVICE CONNECTION IS TAPPED INTO PVC MAIN, THEN A SEWER SADDLE SHALL BE USED. GENECO TYPE "SEALTITE" OR APPROVED EQUAL. BANDS, NUTS AND BOLTS MUST BE 304 STAINLESS STEEL.

4. SDR 26 PVC PIPE MEETING REQUIREMENTS OF ASTM D-2241-05 AND JOINTS CONFORMING TO ASTM D-3139-98(2005) OR LATEST EDITIONS.

City of Naperville **STANDARD DETAIL**	**RISE FOR SERVICE LATERAL** REVISED: 01/01/2013 — SHEET 1 OF 1	SANITARY 20 **390.20**

FIGURE 1
STANDARD TEE CONNECTION
EXISTING CLAY ON PVC

FIGURE 2
STANDARD SADDLE CONNECTION
EXISTING PVC OR LINED PIPE



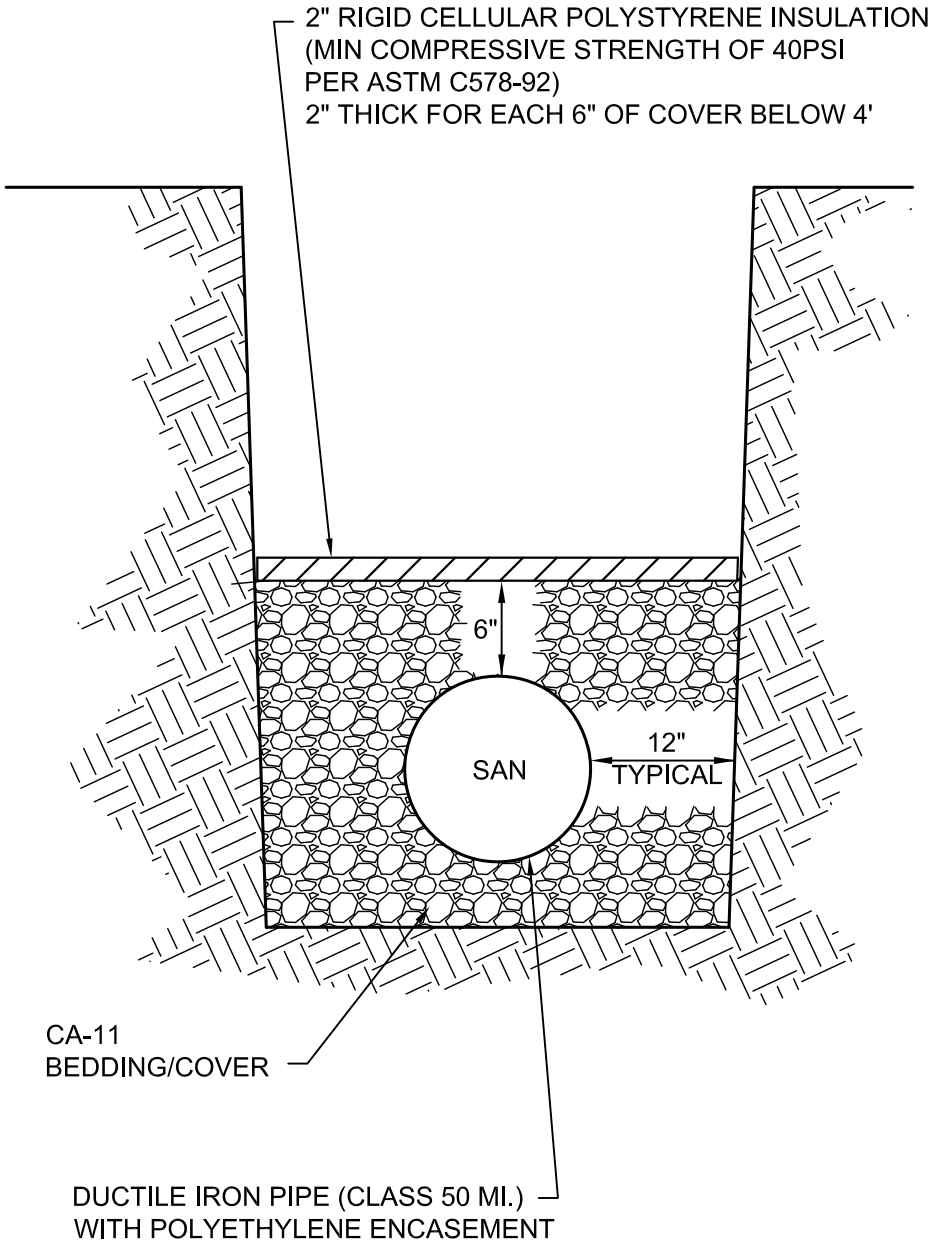
STANDARD TEE CONNECTION-FIGURE 1

1. BYPASS OR RESTRICT FLOW IN PIPE AS REQUIRED.
2. SAW CUT AND REMOVE EXISTING PIPE TO MINIMUM EXTENT SHOWN IN FIGURE 1.
3. INSTALL STANDARD PVC TEE AND PIPE AS SHOWN, PVC SHALL BE SDR26, ASTM 2241.
4. FLEXIBLE COUPLING SHALL BE A NON-SHEARING TYPE TRANSITION COUPLING: FERNCO STRONG BACK RC 1000 SERIES, CASCADE STYLE CSS COUPLING, OR APPROVED EQUAL.

STANDARD SADDLE CONNECTION FIGURE 2

1. FOR LINED PIPE CAREFULLY REMOVE OLD CLAY PIPE TO MINIMUM EXTENT SHOWN WITHOUT DAMAGING LINER PIPE.
2. HOLES FOR SADDLE INLET SHALL BE LAID OUT USING SADDLE AS TEMPLATE AND CUT WITH APPROPRIATE EQUIPMENT NOT DAMAGE THE PIPE TO REMAIN. HOLE TO BE BE DE BURRED AND BEVELED WHERE REQUIRED TO PROVIDE HOLE SLOPE TO CONFORM TO THE FITTING.
3. SADDLE SHALL BE SEALTITE TEE "U" MODEL 40 BY GENCO, CASCADE STYLE CSWRY OR CSWRT, OR APPROVED EQUAL.

THE INSTALLATION OF THIS APPLICATION MUST BE APPROVED IN WRITING BY THE DEPARTMENT OF PUBLIC UTILITIES WATER CIVIL ENVIRONMENTAL ENGINEERING DIVISION



City of Naperville
STANDARD DETAIL

SANITARY SEWER PIPE INSULATION

REVISED: 01/01/2013 | SHEET 1 OF 1

SANITARY 22

390.22

304 INSPECTION AND TESTING

All projects shall be inspected and tested upon completion of installation. The City Engineer will designate the locations of tests and extent of the system to be tested, and extent of recording test results. Equipment for performing tests and making measurements shall be furnished by the contractor. Sections of sewer which fail to pass the tests shall have defects located and repaired or replaced and be retested until within the specified allowance

304.1 MANHOLES

All manholes shall be thoroughly cleaned of dirt and debris and all visible leakage eliminated before final inspection and acceptance.

304.1.1 VACUUM TESTING OF SANITARY MANHOLES

All manholes shall be tested for leakage by vacuum testing. A vacuum of 10 inches Hg shall be placed on the manhole and the time shall be measured for the vacuum to drop to 9 inches Hg. The vacuum shall not drop below 9 inch Hg for the time indicated for each size of manhole as shown in Table 300-2.

TABLE 300-2
REQUIREMENTS FOR MANHOLE VACUUM TESTING

Manhole Diameter (inches)	Max. time for 9” Drop (seconds)
48	60
60	75
72	90
84	105

Any manholes that fail the test shall be sealed and re-tested until acceptable. The testing shall be done after backfilling. Leaks found shall be fixed externally unless approved by City Engineer. The manhole frame and adjusting rings shall be in place at finished grade prior to testing.

304.2 FLEXIBLE PIPE

Prior to other tests all sanitary sewer pipes shall be cleaned and inspected for major defects. Pre-cleaning by appropriately sized sewer cleaning ball or by high velocity jet or other method shall be performed. Any debris, grit, etc. shall be removed and shall not be allowed to enter the existing system.

304.2.1 VISUAL TEST

The City of Naperville may require that sewer lines be inspected visually to verify accuracy of alignment and freedom from debris and obstructions. The percentage of sewer lines inspected will be designated by the City Engineer. The full diameter of the pipe for straight alignments shall be visible when viewed between consecutive manholes. The method of test shall be either photography or closed circuit television, unless a specific method is required by the special provisions and approved by the City Engineer.

304.2.2 DEFLECTION TESTING

A mandrel test is required by the City of Naperville. The City Engineer shall randomly select portions of the project to be deflection tested. Such portions shall consist of the manhole intervals for the initial sewer construction up to 1,200 linear feet and not less than 20% of the remainder of the sewer project. The City of Naperville reserves the right to test more or less pipe if considered appropriate by the City Engineer.

The 5% deflection test for pipe sizes 6 inches to 18 inches in diameter is to be run using a nine-arm mandrel having a diameter equal to 95% of the inside diameter of the pipe as established in ASTM D-2241-96b. Table 300-3 was developed for various pipe sizes using the equations outlined in Section 31-1.11C of the Standard Specifications for Water and Sewer Main Construction in Illinois.

TABLE 300-3
REQUIRED MANDREL SIZE FOR SDR 26 PIPE
(ASTM D2241)

Nominal Pipe Size, Inches	Average Inside Diameter	Required Mandrel Size, Inches
6	6.08	5.68
8	7.92	7.38
10	9.87	9.23
12	11.71	10.98
14	12.86	12.02
16	14.70	13.65

TIME OF TESTING

The individual lines to be tested shall be tested no sooner than 30 days after they have been installed by the contractor. During the first year of implementation, additional testing may be performed by the City of Naperville.

SEQUENCE OF TESTING

Wherever possible and practical, the testing shall initiate at the downstream lines and proceed towards the upstream lines.

TESTING OF ENTIRE PROJECT

In the event that the deflection exceeds the 5% limit in 10% or more of the manhole intervals tested, the total sewer project shall be tested.

RETEST OF FAILED SECTIONS

Where deflection is found to be in excess of 5% of the base inside diameter, the contractor shall excavate to the point of excess deflection and carefully compact around the point where excess deflection was found. The line shall then be retested for deflection. However, if the

deflected pipe fails to return to the original size (inside diameter) after the initial testing, the affected segment shall be replaced.

304.2.3 LEAKAGE TEST

Methods of test which are suitable for various conditions are low pressure air exfiltration or water exfiltration. Explicit instructions for the following methods of test will be supplied by the project design engineer. Plugs, caps, and branch connections must be secured against blow-off during leakage test.

AIR TESTING SAFETY

The contractor is required to follow OSHA rules for trench safety and confined space requirements.

PLUG RESTRAINT

All plugs shall be installed and braced in such a way that blowouts are prevented. Every plug shall be positively braced against the manhole walls, and no one shall be allowed in the manhole adjoining a line being tested so long as pressure is maintained in the line.

RELIEF VALVE

All pressurizing equipment used for low-pressure air testing shall include a regulator or relief valve set no higher than 9 psig to avoid over-pressurizing and displacing temporary or permanent plugs. As an added safety precaution pressure in the test section should be continuously monitored to make certain that it does not at any time exceed 9 psig.

PLUG DESIGN

Either mechanical or pneumatic plugs may be used. All plugs shall be designed to resist internal testing pressures without the aid of external bracing or blocking. However, the contractor shall internally restrain or externally brace the plugs to the manhole wall as an added safety precaution throughout the test.

SINGULAR CONTROL PANEL

To facilitate test verification by the City Engineer, all air used shall pass through a single, above ground control panel.

EQUIPMENT CONTROLS

The above ground air control equipment shall include a shut-off valve, pressure regulating valve, pressure relief valve, input pressure gauge, and a continuous monitoring pressure gauge having a pressure range from 0 to at least 10 psi. The continuous monitoring gauge shall be no less than 4 inches in diameter with minimum divisions of 0.10 psi and an accuracy of 0.04 psi.

SEPARATE HOSES

Two separate hoses shall be used to (1) connect the control panel to the sealed line for inducing low-pressure air, and (2) a separate hose connection for constant monitoring of air

pressure build-up in the line. This requirement greatly diminishes any chance for over-pressurizing the line.

PNEUMATIC PLUGS
If pneumatic plugs are utilized, a separate hose shall also be required to inflate the pneumatic plugs from the above ground control panel.

LINE PREPARATION - LATERALS, STUBS AND FITTINGS
During sewer construction, all service laterals, stubs, and fittings into the sewer test section shall be properly capped or plugged so as not to allow for air loss that could cause an erroneous air test result. It may be necessary and is always advisable to restrain gasketed caps, plugs, or short pipe lengths with bracing stakes, clamps and tie-rods, or wire harnesses over the pipe bells.

PLUG INSTALLATION AND TESTING
After a manhole to manhole reach of pipe has been back-filled to final grade and prepared for testing, the plugs shall be placed in the line at each manhole and secured.

It is advisable to seal test all plugs before use. Seal testing may be accomplished by laying one length of pipe on the ground and sealing it at both ends with the plugs to be checked. The sealed pipe should be pressurized to 9 psig. No persons shall be allowed in the alignment of the pipe during plug testing.

It is required to plug the upstream end of the line first to prevent any upstream water from collecting in the test line.

When plugs are being placed, the pipe adjacent to the manhole shall be visually inspected to detect any evidence of shear in the pipe due to differential settlement between the pipe and the manhole.

LINE PRESSURIZATION
Low pressure air shall be slowly introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any ground water above the pipe, but not greater than 9.0 psig. If ground water is present, refer to 'Determination of Ground-Water Elevation and Air Pressure Adjustment'.

PRESSURE STABILIZATION
After a constant pressure of 4.0 psig (greater than the average ground water back pressure), is reached, the air supply shall be throttled to maintain that internal pressure for at least 4 minutes. This time permits the temperature of the entering air to equalize with the temperature of the pipe wall.

TIMING PRESSURE LOSS
When temperatures have been equalized and the pressure stabilized at 4.0 psig (greater than the average ground water back pressure), the air hose from the control panel to the air supply

shall be shut off or disconnected. The continuous monitoring pressure gauge shall then be observed while the pressure is decreased to no less than 3.5 psig (greater than the average back pressure of any ground water over the pipe). At a reading of 3.5 psig, or any convenient observed pressure reading between 3.5 psig and 4.0 psig (greater than the average ground water back pressure), timing shall commence with a stop watch or other timing device that is at least 99.8% accurate.

DETERMINATION OF LINE ACCEPTANCE
If the time shown in Table 2, for the designated pipe size length (which includes main line sewers and laterals), is achieved before the air pressure drops 0.5 psig; the section undergoing test shall have passed and shall be presumed to be free of defects. The test may be discontinued once the prescribed time has elapsed even though the 0.5 psig drop has not occurred.

DETERMINATION OF LINE FAILURE
If the pressure drops 0.5 psig before the appropriate time shown in Table 3 has elapsed, the air loss rate shall be considered excessive and the section of pipe has failed the test.

LINE REPAIR OR REPLACEMENT
If the section fails to meet these requirements, the contractor shall determine at his own expense, the source or sources of leakage and he shall repair or replace all defective materials and/or workmanship to the satisfaction of the City Engineer. The extent and type of repair which may be allowed, as well as the results, shall be subject to the approval of the City Engineer. The completed pipe installation shall then be retested and required to meet the requirements of this test.

304.2.4 LEAKAGE TESTING – ADJUSTMENTS FOR GROUND WATER
The requirements of this section shall only apply where ground water is known to exist or is anticipated above the sewer line to be tested.

AIR PRESSURE ADJUSTMENT
The air pressure correction, which must be added to the 3.5 psig normal testing starting pressure, shall be calculated by dividing the average vertical height, in feet of ground water above the invert of the sewer pipe to be tested, by 2.31. The result gives the air pressure correction in pounds per square inch to be added. (For example, if the average vertical height of ground water above the pipe invert is 2.8 feet the additional air pressure required would equal 2.8 divided by 2.31 or 1.2 psig. This would require a minimum starting pressure of 3.5 psig plus 1.2 psig or 4.7 psig.) The allowable pressure drop of 0.5 psig and the timing in Table 300-4 are not affected and shall remain the same.

MAXIMUM TEST PRESSURE
In no case should one starting test pressure exceed 9.0 psig If the average vertical height of ground water above the pipe invert is more than 12.7 feet, the section so submerged may be tested using 9.0 psig as the starting test pressure.

SPECIFIED TIME TABLES

To facilitate the proper use of this required practice for air testing, Table 300-4 is provided. Table 300-4 contains specified minimum times required for a 0.5 psig pressure drop from a starting pressure of at least 3.5 psig greater than the average back pressure of any ground water above the pipe's invert.

TABLE 300-4

SPECIFIED TIME REQUIRED FOR A 0.5 PSIG PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015

(1) Pipe Dia.	(2) Min. Time	(3) Length For Min. Time	(4) Time For Longer Length	Specification Time for Length (L) Shown (min:sec)								
(in)	min:sec	(ft)	(sec)	100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft	500 ft
4	1:53	597	0.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	0.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12	3:34
8	3:47	298	0.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42	6:20
10	4:43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54	9:54
12	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50	14:15
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02	22:16
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51	32:03
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16	43:38
24	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17	56:59
27	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	46:54	72:07
30	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07	89:02
33	15:35	72	12.926 L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57	107:43
36	17:00	66	15.384 L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23	128:12

Department of Public Utilities - Water & Wastewater

ADMINISTRATION DIVISION (2.0)
1200 West Ogden Ave. (Water Service Center)
DIRECTOR'S OFFICE (2)
Director of Public Utilities: **Darrell Blenniss**
Utility Analyst: John Sather

WATER RECLAMATION DIVISION (22.5)

3712 Plainfield/Naperville Road

MANAGER'S OFFICE (2.5)

Operations Manager	**Joe Slevnik**
Technical Specialst:	Amy Wrigley
Administrative Assistant: (0.5)	Kelly Decker

LABORATORY (3)

Regulatory Compliance Manager:	Lisa McNames
Chemist:	Jill Thiel
Utility Technician III-Lab:	William Goerich
Lab Intern:	Thomas Abner

WATER RECLAMATION (17)

Operations Supervisor:		**David Today**
Operations Field Supervisor (2):		**Tom Greybill**
		Carl Christensen
Utility Technician IV (8):		
Rick Flaar		Jeff Nier
Mark Walton		Jeff Johnson
Harry Schultz		Dan Goldsmith
William Powers (L)		Brent Frantzen
Maintenance Supervisor:		**Robert Yagoda**
Maintenance Field Supervisor:		**Greg Olthoff**
Utility Technician III (2):	Sam Olivio	Steve Guistolise
Utility Technician IV (2):	Rob Holzkopf (L)	Carter Szok
Summer Worker (1) TBD		

WATER DISTRIBUTION & COLLECTION DIVISION (47.0)

1200 West Ogden Avenue

MANAGER'S OFFICE (8)

Operations Manager:	**Tony Conn**
Sr Administrative Assistant:	Marge Schlueter
Administrative Assistant:	Joann Griessler
Customer Service Rep:	Yvette Davila-Nuno
Engineering Technician:	Lori Albright
Utility Specialist:	Angie Keller
Utility Specialist:	Kevin Steltzriede
Water Project Manager:	Patrick O'Malley

WATER SUPPLY & DISTRIBUTION (9)

Water D & M Supervisor:		**Kerry Anthenat**
Water D & M Field Supervisor:		**David Sloan**
Utility Technician I (4):	Israel Pasillas	Jarett Ripsky
	Micky Nicholas	Chad Young
Utility Technician II (3):	Joe O'Malley (L)	Jim Lenert (L)
	Mark Klossing	
Summer Workers (2):	*May - Aug 2019*	

WATER SUPPLY (5)

Water Supply Supervisor:		**Joe King**
Utility Technician IV (4):	David Schlueter (L)	Josh Orin
	Mike Waters	Sean Young
Summer Workers (2):	*May - Aug 2019*	

Repair & Excavation (12 FTE *not including vacant*)

Repair & Excavation Supervisor:		**John Vose**
Repair & Excavation Field Supevisor:		**Brett Johnson**
Utility Technician III (8):	Jeremy Abel (L)	**Vacant**
Keith Chilicki	Bradley Rodgers	Derek Rafacz
Max Nerison	Aaron Alvarez	Luke Lopez
Utility Technician IV (3):	Pete Kovacs (L)	
	Martin Alvarado (L)	Chris Myers (L)

WW COLLECTION & PUMPING (FTE 12)

WW C&P Supervisor:		**Katy Librizzi**
WW C&P Field Supervisor:		**Frank Selvaggi**
Utility Technician II (7):		
Terald Brue	Brent Daggett	Bob McQuen (L)
Wayne Thome	Dino Tinajero	Jason Tranchitella
Brad Nolan		
Utility Technician III (1):	Steve Subat	
Utility Technician IV (2):	Jamie Antich (L)	Tim Sloan
Summer Intern (1):	*May-Aug 2019*	

CIVIL-ENVIRON. ENGINEERING & CONSTRUCTION MGT. DIVISION (11.25)

3612 Plainfield/Naperville Road

MANAGER'S OFFICE (2)

Deputy Director:	**Amy Ries**
Financial Engineering Specialist:	Monica O'Loughlin

CONSTRUCTION ENGINEERING & PROJECT MANAGEMENT (5)

Senior Civil Environmental Engineer:	Josh Strait
Senior Civil-Environmental Engineer:	Jason Xi
Civil-Environmental Engineer:	Kristina Murphy
Utility Specialist:	Gerardo Villalobos
Project Manager	Douglas Splitt

UTILITY LOCATING INSPECTIONS & MAPPING (4)

Utility Inspection Supervisor:		**Bill Bolster**
Utility Inspector:		Gary Wallace
Utility Technician II (2):		
	Rick Garcia	Dave Lesac

GIS Technician

GIS Technician	Part Time (0.25)	Billy Ramsak
Engineering Intern	*May - Aug 2019*	Olivia Taylor

Summary

Revised: 6/ 18 /19

Present Employees:	**82.75**
Vacant:	**1.00**
Total FTE's	**83.75**
Temporary Workers:	**1.73**
Total Authorized:	**85.48**

COLLECTION & PUMPING
SEWER CLEANING GUIDE LINES
Updated March 2019

BEFORE LEAVING THE SHOP:

- Complete daily CDL safety inspection including check
- Ensure you have the following items:
    - Assigned basin map
    - Flushing forms
    - Fushing complaint forms
    - Safety cones
    - PPE (shirts, vests, hard hat, ear protection, eye protection)
    - Assigned Cell phone, computer, and headset
- Ensure all confined space gear is woring correctly (gas meters, winch, tripod) prior to leaving the shop.
- Large roll of black tape for securing vactor clamps when vacing
- Paper towels and cleaning products
- Spare root saw motor and blades including any miscellanous items needed for rootsaw motors
- During cold weather flushing, bring a 5 gallon bucket of salt with you to spread over icey areas on sidewalks and crosswalks to prevent people from falling when your done with your setup.

FILLING WATER TANK ON FLUSHER

- If filling from a hydrant in the field, check flushing maps for any notes regarding hydrants
- Don't use Corey hydrants to fill flushers
- When using Traverse City hydrants - open five turns only
- Open all other hydrants completely. This will allow the hydrant drain almost completely and prevent vibration.
- Before connecting the hose, open the hydrant to check for sand or rust. Low flow hydrant to clear if needed. If it takes more than two minutes to clear, notify your Field Supervisor. If you encounter mechanical problems with a hydrant or water quality problems, contact your Field Supervisor.
- In below freezing weather make sure there is no trapped water in the caps and hydrant is fully closed and draining.
- In below freezing weather, use the recirculator on flushers to help prevent hoses from freezing
- Schedule breaks around fill-ups whenever possible.

CLEANING SEWER MAINS

- Locations of flusher & tender truck should be in a position that is the least disruptive to traffic.
- Avoid driving off paved surfaces at all times.
- If you need traffic control assistance contact your Field Supervisor.
- Clean all lines thoroughly. Remove all debris from lines and manholes. Enter manholes/vac manhole following proper procedures to remove debris as needed. If you need assistance in removing debris, contact your Field Supervisor.

- Use a manhole roller assembly directly over the manhole.
- Use a tiger tail at all times to protect the hoses
- Make sure nozzle is in pipe before starting the pump or any pressure
- If nozzle will not move, make sure water pump/pressure is off before looking into the manhole.
- Flushing with Enz bulldog spinning nozzles: Do not exceed 1,500 PSI when going upstream. When cleaning the lines do not exceed 1,000 PSI when retrieving the nozzle.
- When flushing low pressure sets, Go no more than 1000 PSI up a line and no more than 700 PSI back down a line.
- When root cutting, go up the line with no more than 1500 PSI and come back with no more than 1200 PSI.
- Pull flusher hose back at a slow rate of speed to avoid problems with vacuum pressure which will cause water to spray out of toilets and floor drains.
- When flushing double sets make sure each manhole is inspected while jet flushing. (Both up the line and back down the line.) This will insure no debris is left behind when cleaning.
- Inspect/check to make sure nozzle makes it through each manhole, dead end manholes might have service lines in them.
- Catch all debris before interceptors; don't allow debris to enter an interceptor or trunk sewer.
- Check Basin map for low pressure sets, flow meter locations, remove clean out caps as needed. Notify Homeowners when noted.
- Cleaning of interceptors and trunk sewers requires larger nozzles and higher pressure. Consult with field supervisor before using.
- Don't reverse flush any set without consulting with your field supervisor.
- All manholes in the basin being flushed need to have a top down visual inspection. Every manhole, including those on double sets need to be opened and visually inspected from the top.

ROOT CONTROL

- Review basin maps for root cutting or jet flushing. Some basin maps require both.
- Root removal is done with a rootsaw motor and proper size blade or bushes for the pipe size.
- Manholes: Inspect all manholes while sewer cleaning. Use supplied tools to remove roots in a manhole and note any root intrusion on basin flushing map

FOG (Fats,Oil, Grease)

- Review basin maps and PMS maps for grease routes.
- Use ENZ spinning nozzle on all grease routes. Follow above procedures.

PAPERWORK

- Fill out flushing report by listing each set separately even when flushing double sets or PMS
- Note condition of lines, problems, debris, etc on reports and on flushing map
- Note total footage at the bottom of the flushing report, lines flushed twice or more but do not add additional footage to the total.
- Mark up your field basin map as sets are completed and turn in with flushing reports at the end of each day to your Field Supervisor. Mark up field basin maps with changes noted in the field, such as additional low pressure sets, manhole locations, etc.
- Note any equipment problems or extra time need in writing for the work day.
- Discuss any potential issues found in the fields (i.e roots in manholes, grease) with field supervisor and if asked, create work order with documentation for R&E to

- Fill out flushing complaint forms as needed. Make sure you include Name of customer, Phone number, Address of problem and manhole set and work order number on paperwork.
- At the end of each day make sure flusher is half full of fuel, water tanks are full, and the debris tank is emptied and all paperwork is turned into your fieldsupervisor.
- Inspect the leader hose, flusher hose and change out water filter as needed.
- When cleaning the interceptors, clean out water filter at the end of every day.

MAINTENANCE

- Spray nozzles with penetrating oil at the end of every day.
- Keep root saw motors lubed to prevent rust buildup.
- Keep all tools and vehicles clean and in good working condition.

VACING

- When operating the vactor tube, ear protection/personal radio headsets, hard hats, and safety glasses are required at all times
- Inspect vac tubes for any damage before and after every use.
- Vactor tube clamps:
    - Inspect all clamps before use. If a clamp is damaged ***do not use***.
    - Line up clamps so that latches are in the same position the entire length of the vac tube.
    - Tape all clamps with duct tape or electrical tape to prevent them from opening.

SAFETY

The following PPE is required to be worn at all times when flushing:

- Safety Glasses
- Safety Vest or Shirt
- Gloves

The following PPE is required to be worn at all times when vacing:

- Hard hat
- Ear muffs / head set radios
- Safety glasses
- Safety vest
- Gloves

Traffic Control:

- Consult with Field Supervisor/ Section Supervisor on traffic plan and what will be needed prior to leaving shop

Always call the Field Supervisor or Supervisor if issues arise or you need anything while in the field. Should neither be available, call a leadman to assist.

Naperville

Department of Public Utilities - Water

COLLECTION & PUMPING

2019 SANITARY GRAVITY MAIN CLEANING SCHEDULE: JANUARY - DECEMBER

PMS

Month	Quarterly Semiannual	LnFt	Complete
Jan	---	12,893	Y
Feb	Quart 2	29,800	Y
Mar	Quart 1 Semi 1	43,198	Y
Apr	Semi 2	53,470	Y
May	Quart 2	29,800	Y
Jun	Jun-Q	35,418	Y
Jul	---	12,893	Y
Aug	Quart 2 N07	29,800	Y
Sept	Quart 1 Semi 1	43,198	Y
Oct	Semi 2	53,470	
Nov	Quart 2	29,800	
Dec	Quart 1	35,418	
	YEARLY TOTAL	409,161	

INTERCEPTOR - CLEAN

Interc	LnFt	Who	Comp
	Actual	*Clean*	
TBD			
Total			

*NOTES:

1. W06 do in winter months.
2. C05/C06/C11/C12/C13 do in summer months or weekends due to school traffic.
3. C12/C13 recon basins week prior to flushing.
4. C13 4 man crew and use hydrant while flushing.
5. N07 complete with Aug PMS.
6. Some sets are rootsaw marked on flushing maps

BASIN CLEANING

	Basin	LnFt	Complete		Basin	LnFt	Complete		Basin	LnFt	Complete		Basin	LnFt	Complete
1	C56*	21,829	3/11/19	28	C05*	26,492	7/27/19	55	C13*	11,682					
2	W26	16,526	1/22/19	29	C06*	28,456	7/26/19	56	C12*	5,002					
3	W25	17,225	2/11/19	30	C08	17,694	6/17/19	57	C11*	9,981					
4	C37	2,892	3/13/19	31	C09	7,394		58	S26	14,864	8/26/2019				
5	C02	14,502	2/28/19	32	C23	16,139	6/18/19	59	S10	13,321	9/26/2019				
6	C01	23,144	3/26/19	33	N11	9,164	6/11/19	60	S11	14,717	IP				
7	C51	22,995	4/10/19	34	N19	18,711	6/17/19	61	S12	6,773	IP				
8	N07*	18,680		35	C32	11,670	6/25/19	62	S13	22,681	IP				
9	N06	12,655	4/17/19	36	C53	9,854	6/19/19	63	S17	20,541	IP				
10	N14	11,429	4/24/19	37	C36	9,519	6/27/19	64	S14	10,203					
11	N20	12,267	4/12/19	38	C33	13,314	6/25/19	65	S16	22,253					
12	W19	12,437	4/24/19	39	C49	18,272	7/8/19	66	S23	30,531					
13	N21	17,680	4/19/19	40	C27	7,524	7/3/19	67	S25	2,901					
14	N22	17,551	5/14/19	41	C37	2,892	3/13/19	68	S24	23,919					
15	N23	5,028	5/14/19	42	C35	11,782	7/3/19	69	S34	15,445					
16	N24	11,888	5/16/19	43	C38	6,982	7/19/19	70	S62	22,739					
17	N26	9,228	4/27/19	44	C29	8,283	7/10/19	71	W06*	30,350	4/1/19				
18	N25	10,330	5/16/19	45	C39	8,719	7/9/19	72	W07	30,035					
19	C03	4,665	5/10/19	46	C30	4,252	7/30/19	73	C01	23,144					
20	C17	14,892	5/21/19	47	C43	3,165	7/30/19	74	N15	35,589					
21	C15	4,440	5/20/19	48	C24	10,317	8/6/19	75	N16	34,399					
22	C16	7,428	5/23/19	49	C59	26,865	8/17/19	76	C28	18,262					
23	C07	22,033	5/23/19	50	S01	17,809	8/10/19								
24	C14	6,688	5/24/19	51	S03	11,457	8/16/19								
25	C41	6,857	6/5/19	52	S09	30,994	9/5/19								
26	C04	20,259	6/4/19	53	S06	17,754	8/30/19								
27	C55	17,423	6/5/19	54	S37	25,358	9/16/2019								
	Total	362,971				380,832				419,332			Total		

YEAR TOTAL

Clean	Ln Ft
Flush/ Rootsaw	1,163,135
PMS	409,161
Interceptor	0
Siphons	0
TOTAL LF	1,572,296

CLEANING IN MILES

Flush/ Rootsaw	220
PMS	77
Interceptor	0.0
TOTAL MILES	297.8

CIPP LINING

Large Diameter	2,706
Small Diameter	12,994
TOTAL LF	15,700
TOTAL MILES:	2.97

KEY	ACTIVITY
every 1 yr	Rootsaw
every 2 yr	Flush
every 3 yr	
every 4 yr	
every 5 yr	

HOT SPOTS INSPECTION SHEET

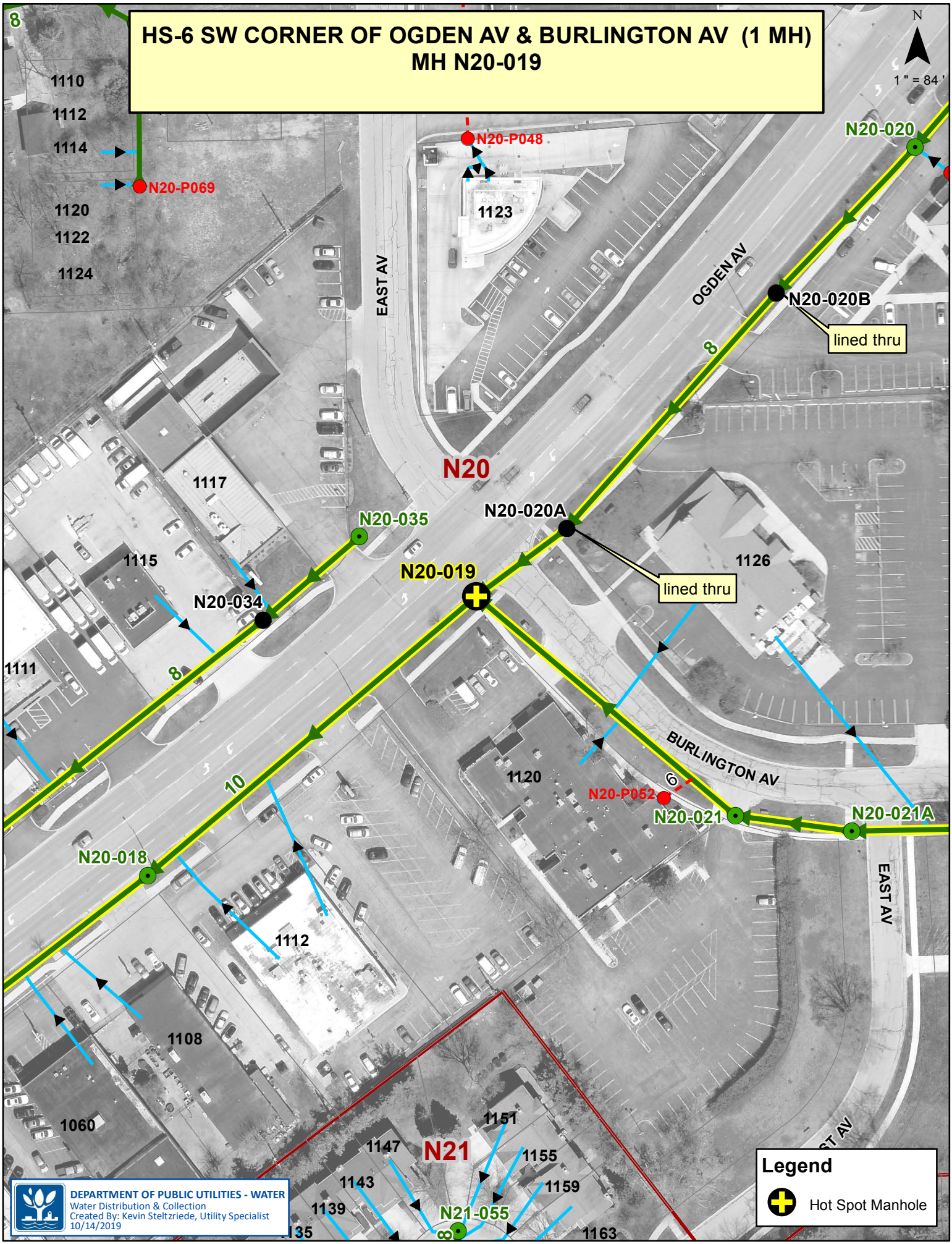
MONTH_____

DESIGNATION:	LOCATION:	COMMENTS	INSP BY & DATE
HS-6	S.W. Corner of Ogden & Burlington		
HS-7	Cheshire/Kent Ct		
HS-10	644 N Eagle		
HS-11	Santa Maria Ct		
HS-14	Indian Trail Dr/(dead end MH)		
HS-15	12th Ave and Washington		
HS-17	44 Fremont (on Cottage)		
HS-19	Enterprise-Naper West Plaza		
HS-20	Operate Ogden Manor Divertible valve		
HS-21	Fort Hill - 75th, 3 Farms, Audrey Dr		
HS-26	4th Av and Sleight		
HS-28	Ring Rd & Kingsley Ct		
HS-29	2846 Hillcrest Circle		
HS-30	840 Hawthorn Dr		
HS-31	Shumard Ln		
HS-32	5th Av & Mill St		
HS-33	McCartney Dr		
HS-34	Wehrli Rd		
HS-35	NW corner Rt 59 & 111th St		
HS-37	Chinaberry (Ashwood Park)		
HS-38	Rt 59 & Brookdale - McDonalds		
HS-41	NE Corner Aurora & Rt 59 (Fruitful Yield)		
HS-42	High Grove Ln (Loaves & Fishes)		
HS-43	Washington St & Olympus Dr		
HS-44	Ashley Furniture/Staples - Route 59		

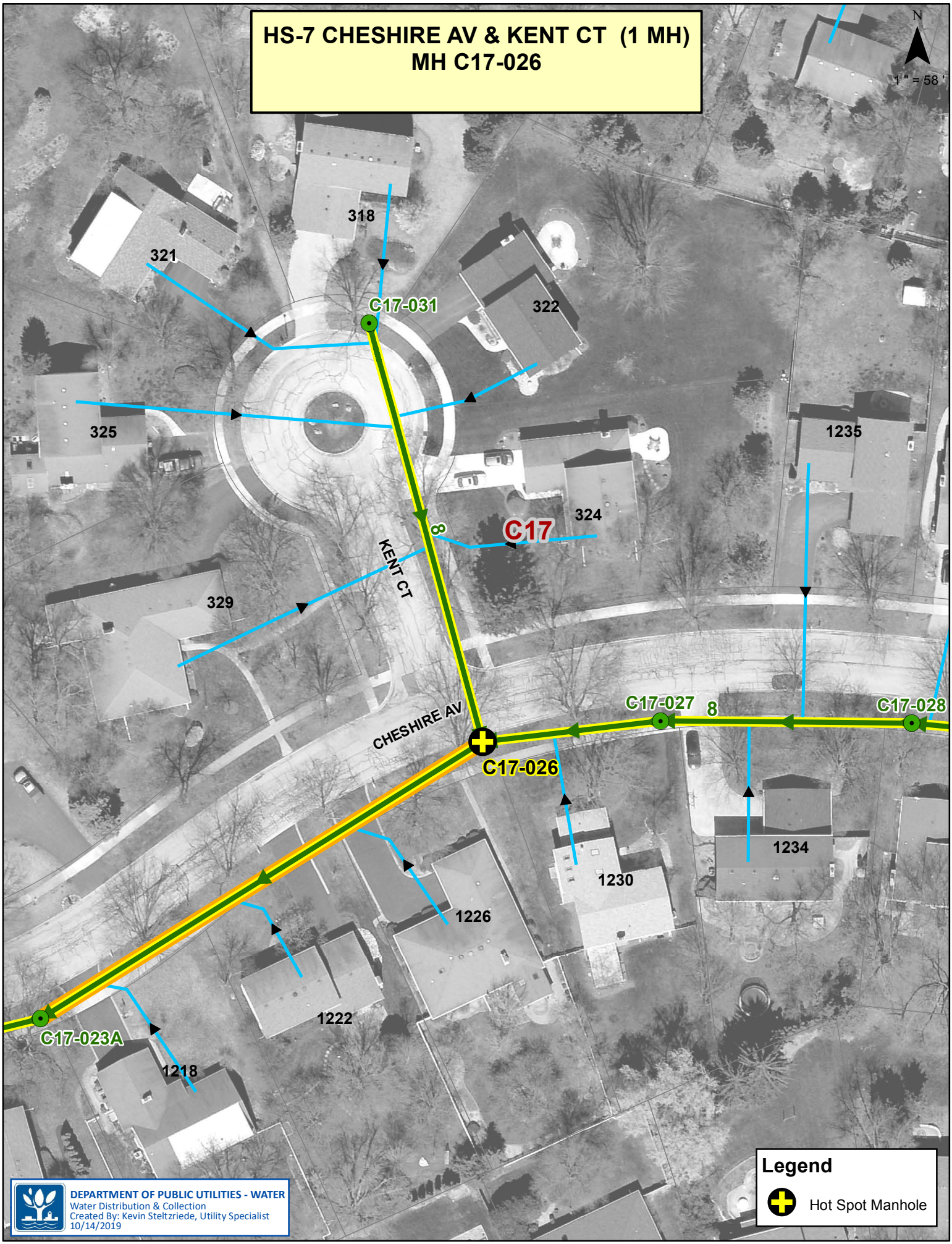
DOCUMENT ALL FLUSHING ON A FLUSHING REPORT.
SUBMIT COMPLETED FLUSHING FORMS IN THE HOT SPOT FOLDER

Employee/Truck #	TASK (inspection, flush, rootsaw)	DATE	HOURS

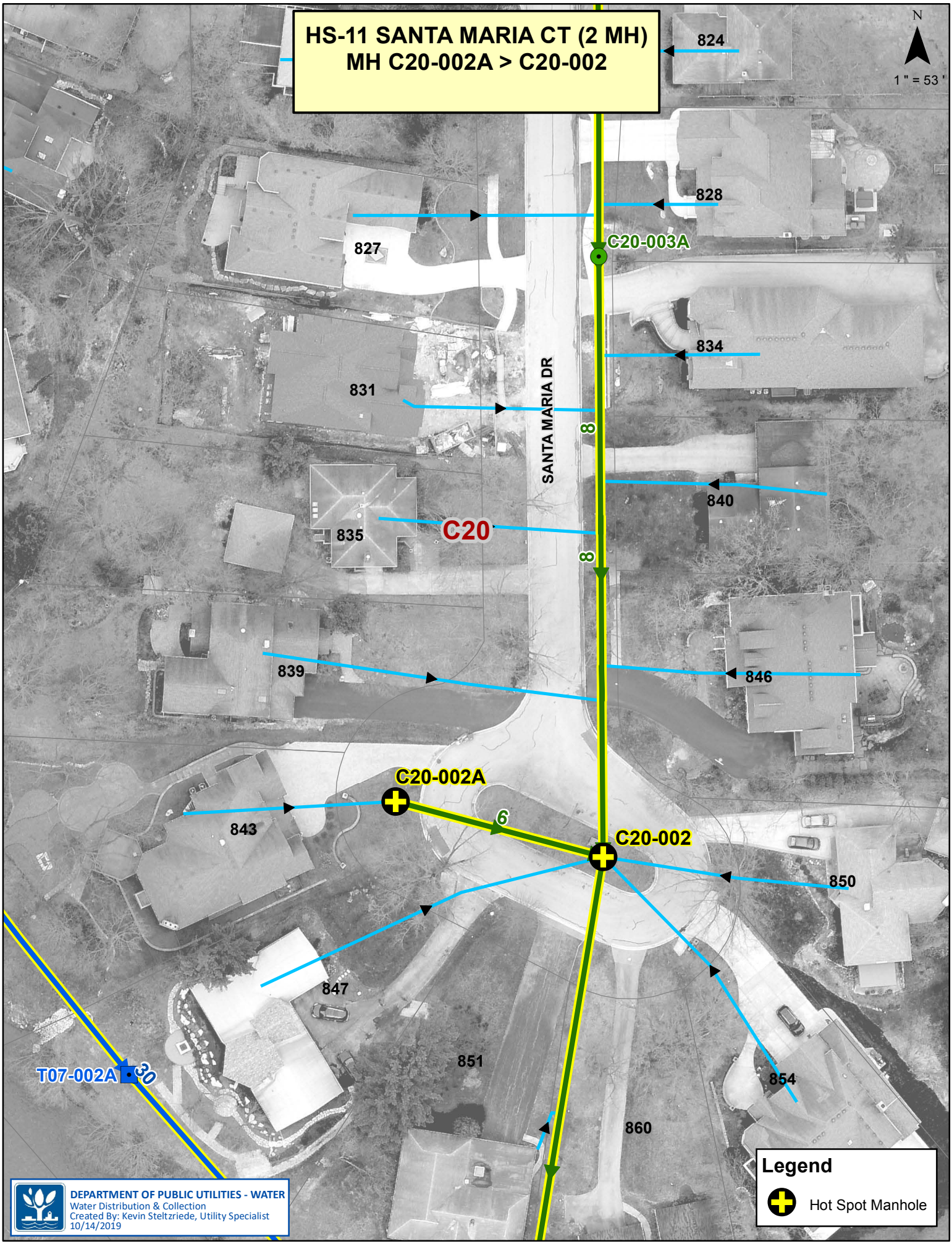
HS-6 SW CORNER OF OGDEN AV & BURLINGTON AV (1 MH)
MH N20-019

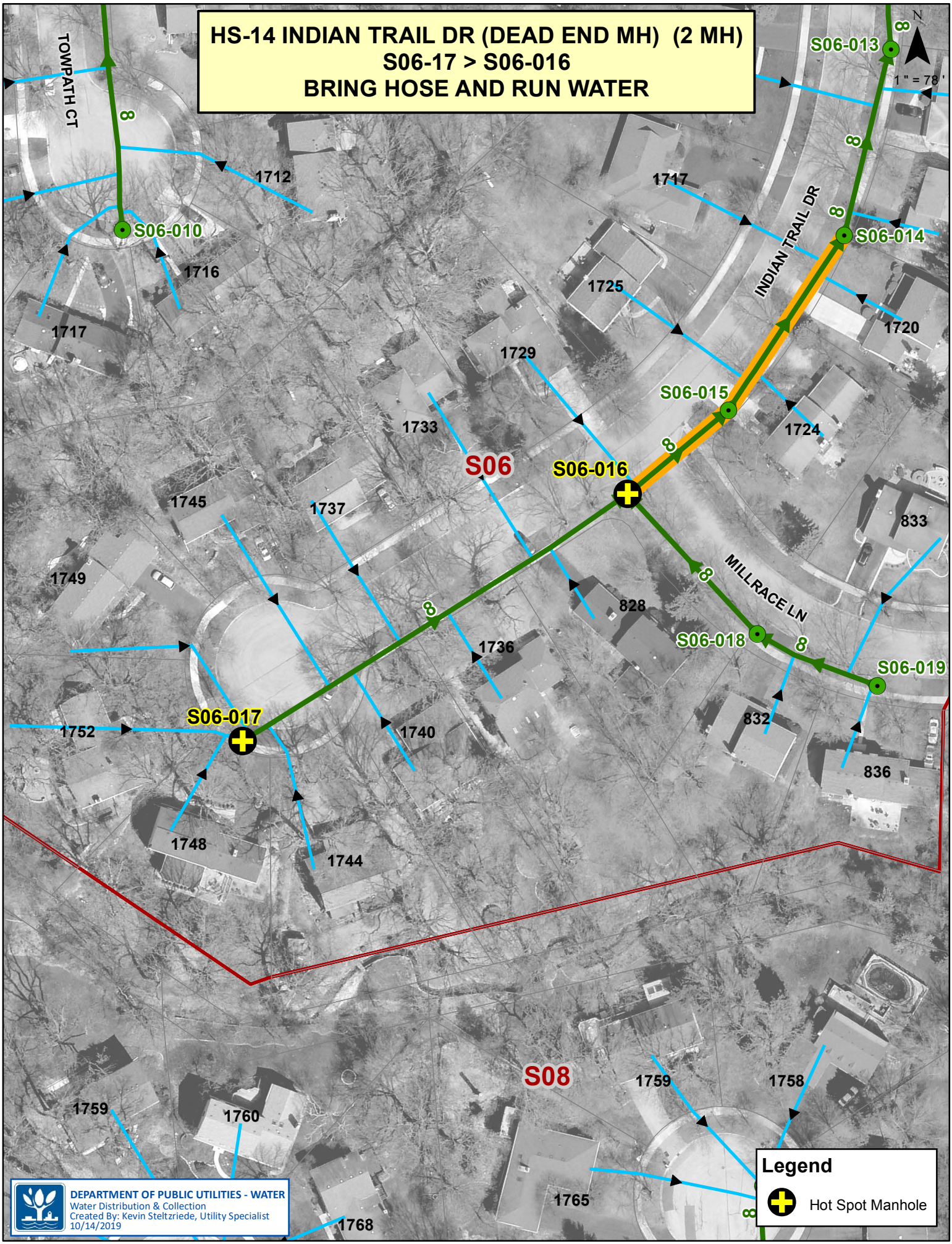


HS-7 CHESHIRE AV & KENT CT (1 MH)
MH C17-026

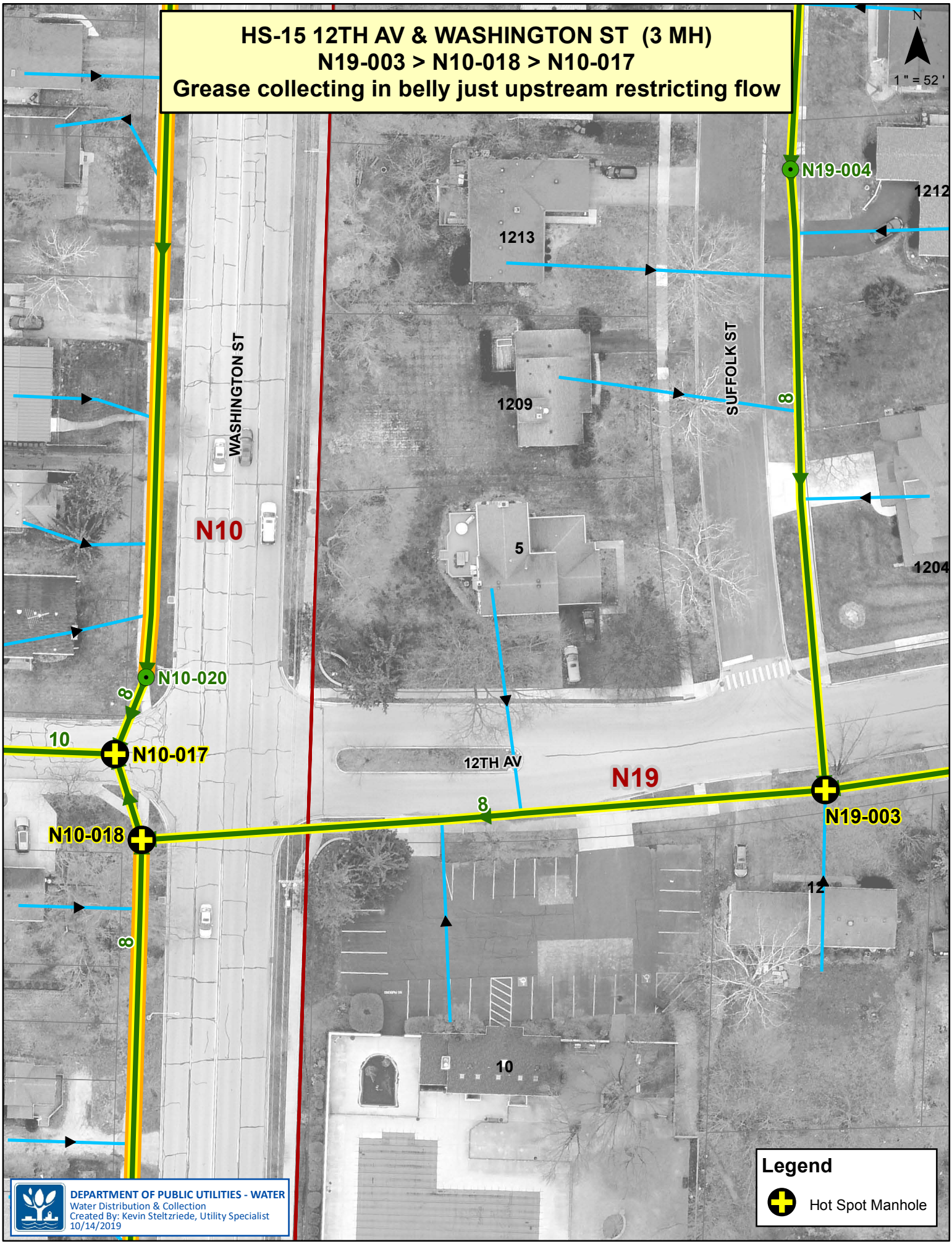


HS-10 644 N EAGLE ST (1 MH)
MH N24-026A
N
1 " = 46 '
N24-024
N24-025
N24
N24-026
N24-026A
N24-027
8
6
EAGLE ST
665
664
659
660
655
656
649
648
645
644
639
642
635
636
629
630
Legend
Hot Spot Manhole
DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019


HS-11 SANTA MARIA CT (2 MH)
MH C20-002A > C20-002
N
1 " = 53 '
824
828
827
C20-003A
834
831
SANTA MARIA DR
8
840
835
C20
8
839
846
C20-002A
843
6
C20-002
850
847
851
854
T07-002A
30
860
Legend
Hot Spot Manhole
DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019

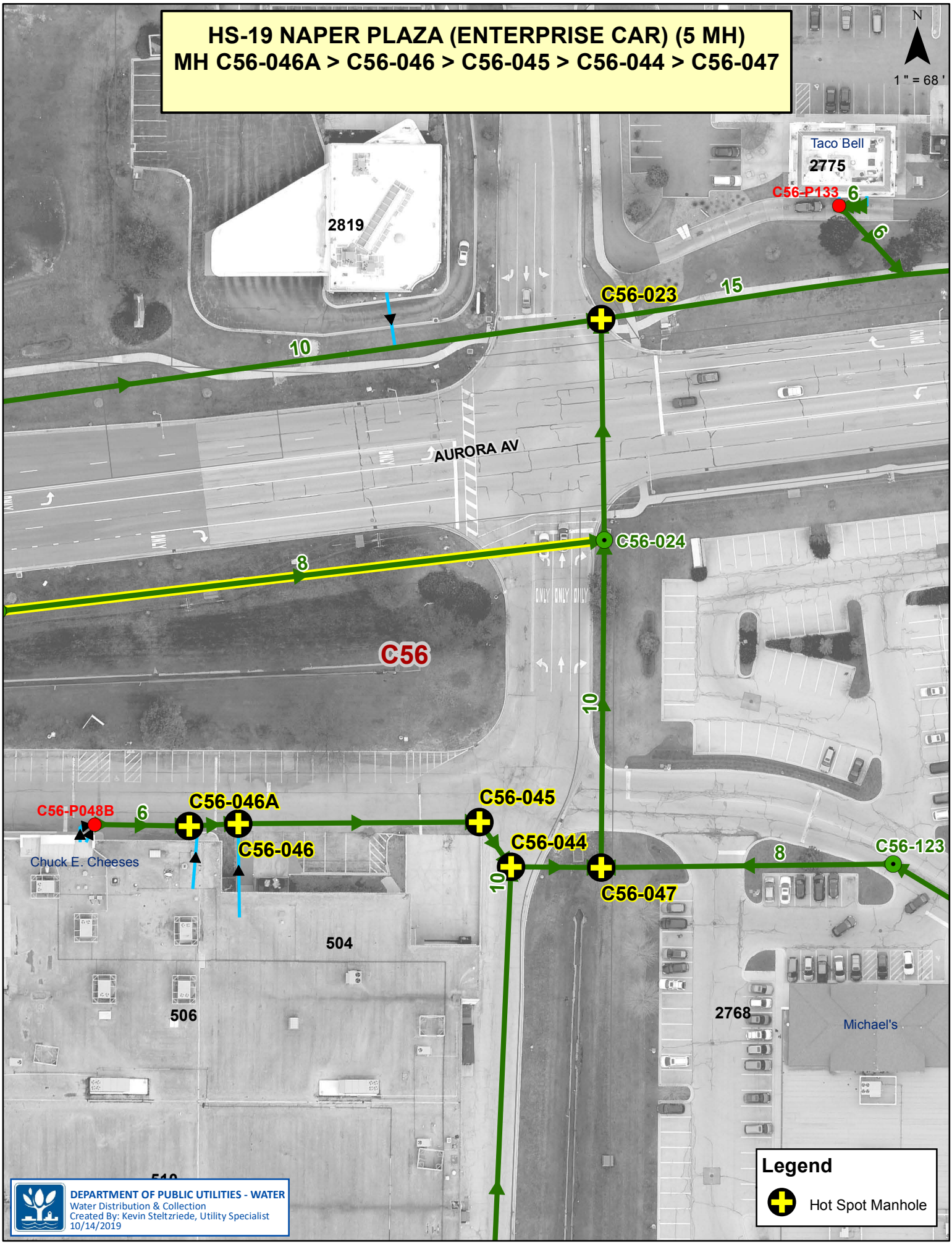

HS-14 INDIAN TRAIL DR (DEAD END MH) (2 MH)
S06-17 > S06-016
BRING HOSE AND RUN WATER
N
1 " = 78 '
TOWPATH CT
INDIAN TRAIL DR
MILLRACE LN
S06-013
S06-014
S06-015
S06-016
S06-017
S06-018
S06-019
S06-010
S06
S08
1712
1717
1716
1725
1720
1729
1724
1733
1745
1737
833
1749
828
1736
832
836
1752
1740
1748
1744
1759
1760
1758
1765
1768
Legend
Hot Spot Manhole
DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019

HS-15 12TH AV & WASHINGTON ST (3 MH)
N19-003 > N10-018 > N10-017
Grease collecting in belly just upstream restricting flow



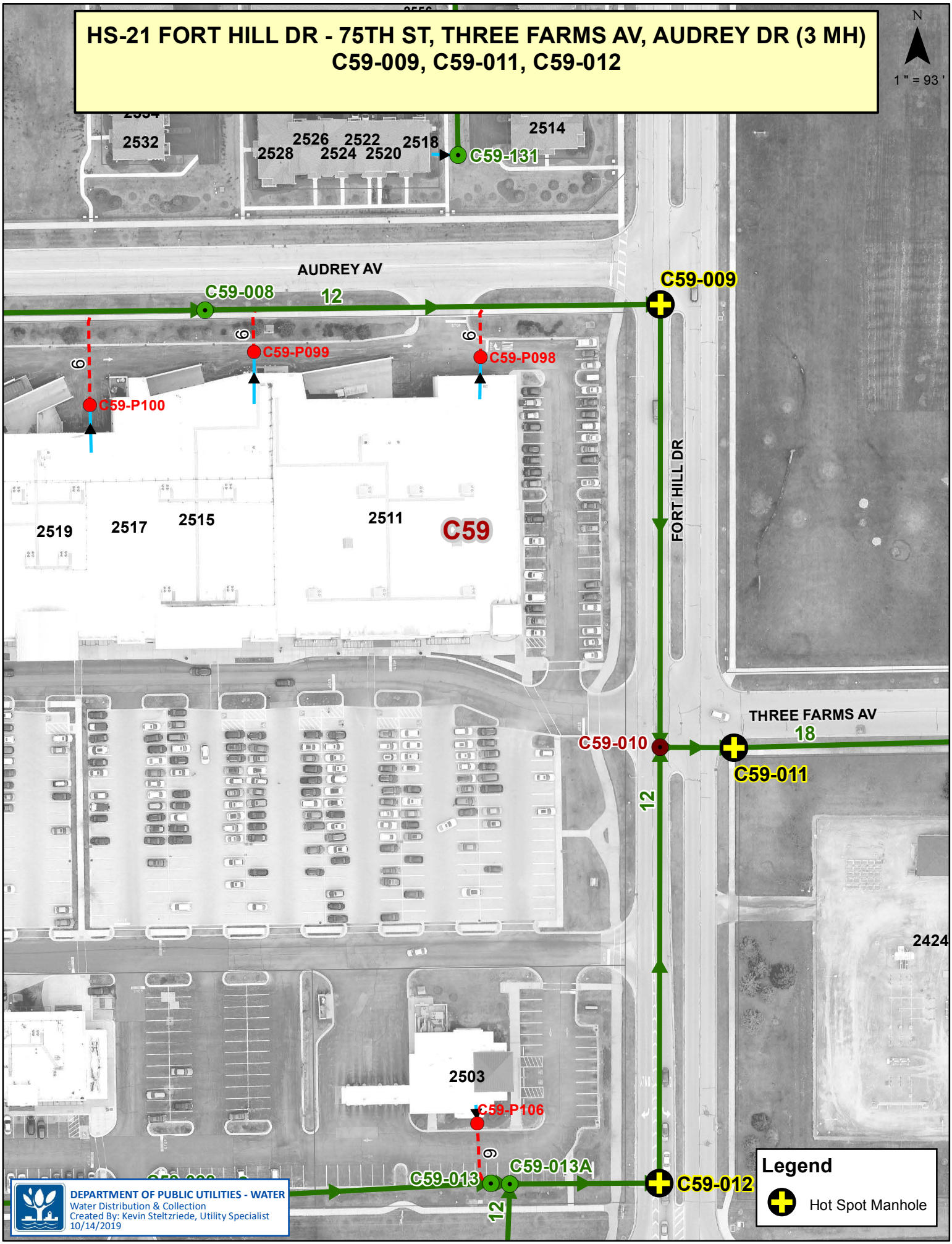
HS-17 COTTAGE AV & WEST ST (2 MH)
MH C05-031B > C05-031A

HS-19 NAPER PLAZA (ENTERPRISE CAR) (5 MH)
MH C56-046A > C56-046 > C56-045 > C56-044 > C56-047



HS-20 OGDEN MANOR DIVERTABLE VALVE
MH N14-001
Valve Is reverse threaded. Left is tighter, right is looser. 71 turns = fully open

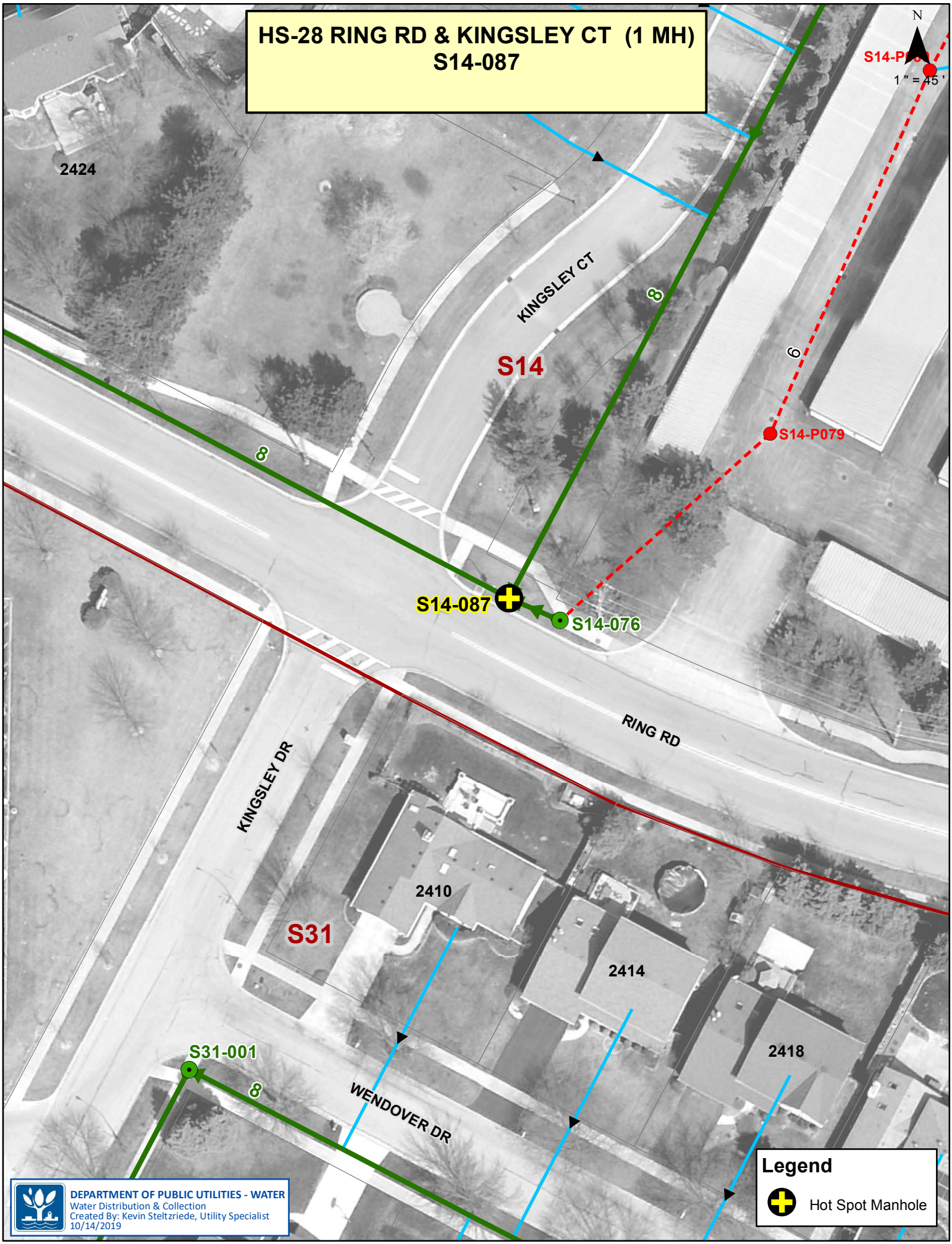
HS-21 FORT HILL DR - 75TH ST, THREE FARMS AV, AUDREY DR (3 MH)
C59-009, C59-011, C59-012



HS-26 4TH AV & SLEIGHT ST (1 MH)
C06-047A

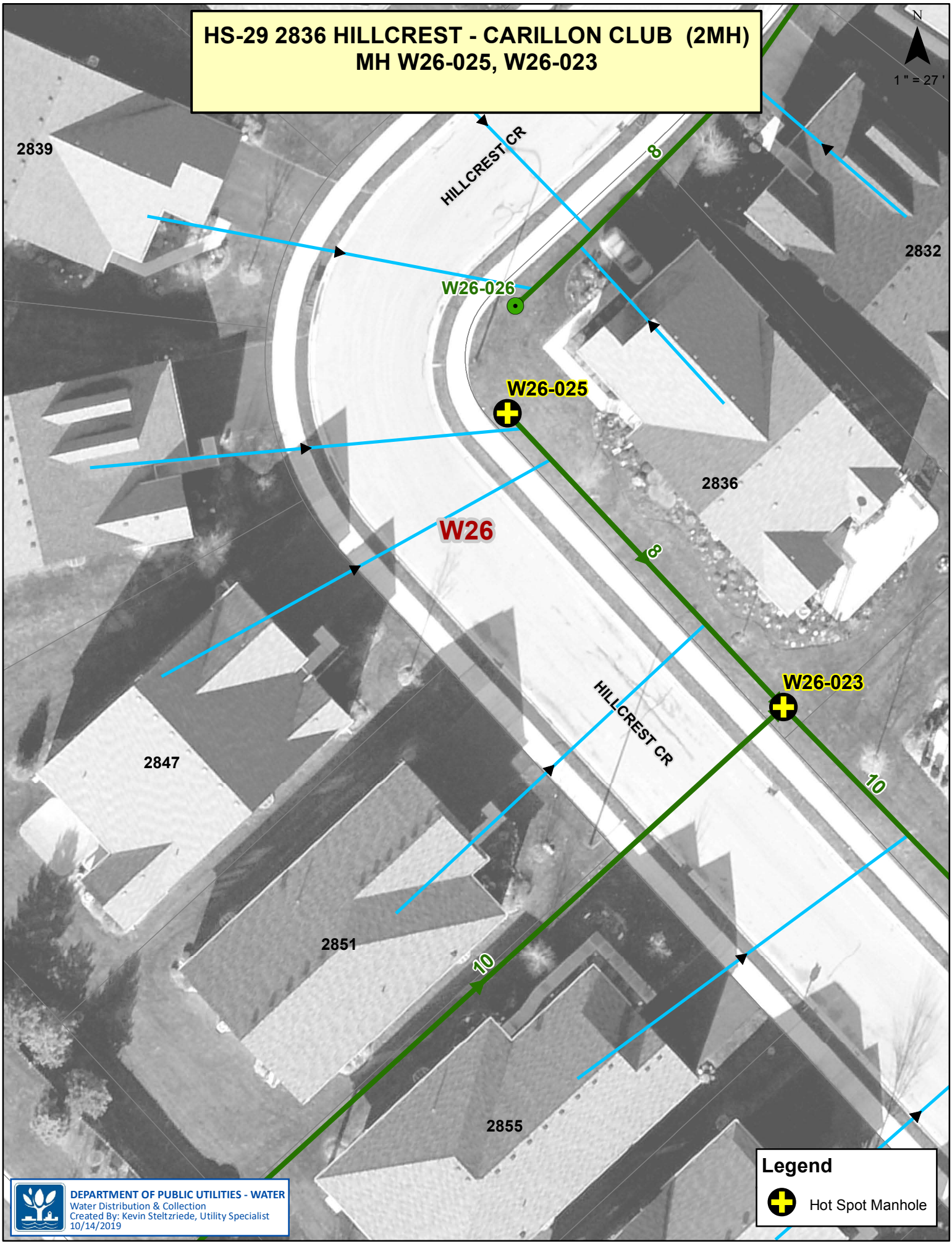
DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019

HS-28 RING RD & KINGSLEY CT (1 MH)
S14-087



DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019

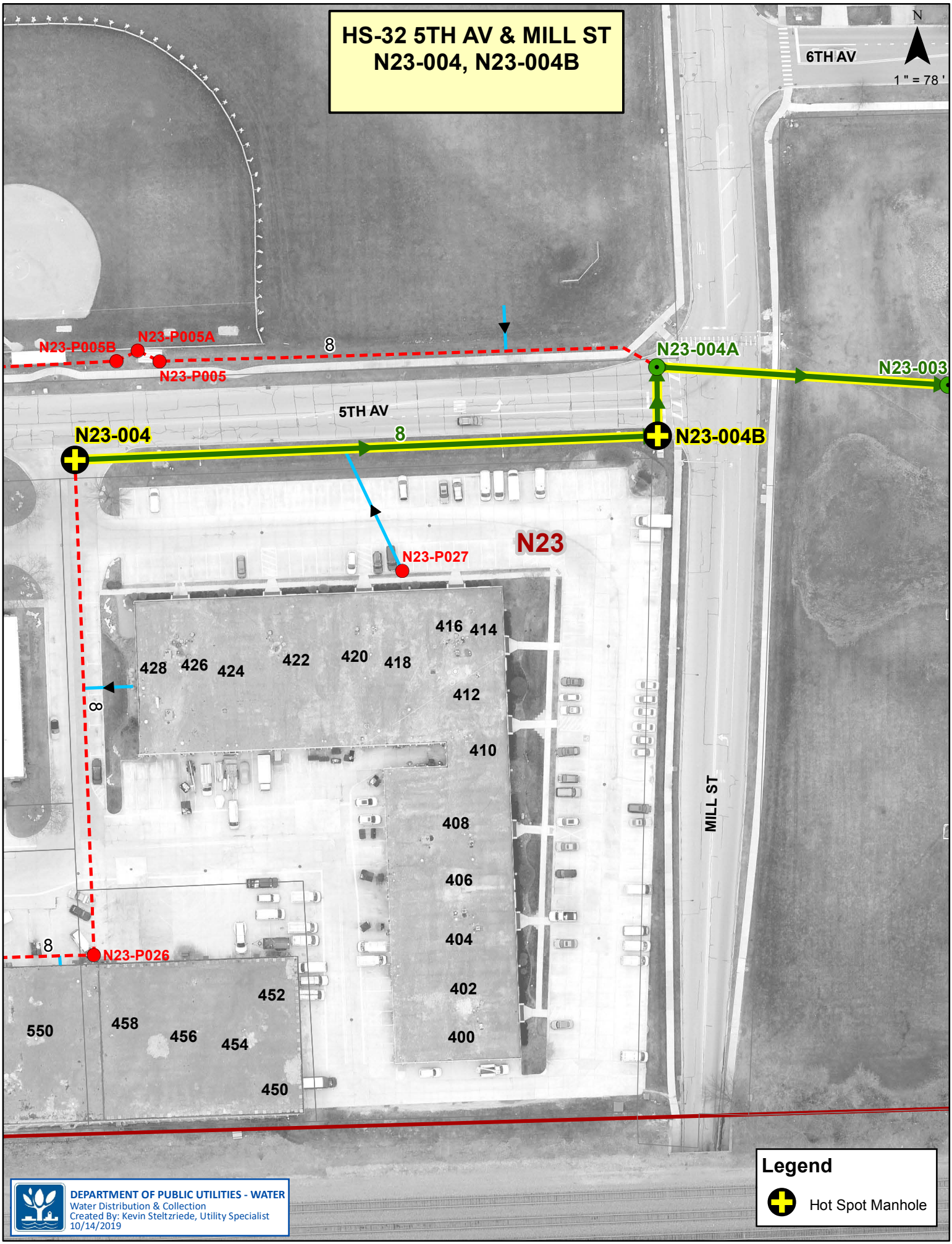
HS-29 2836 HILLCREST - CARILLON CLUB (2MH)
MH W26-025, W26-023



HS-30 840 HAWTHORN DR (1 MH)
C43-005

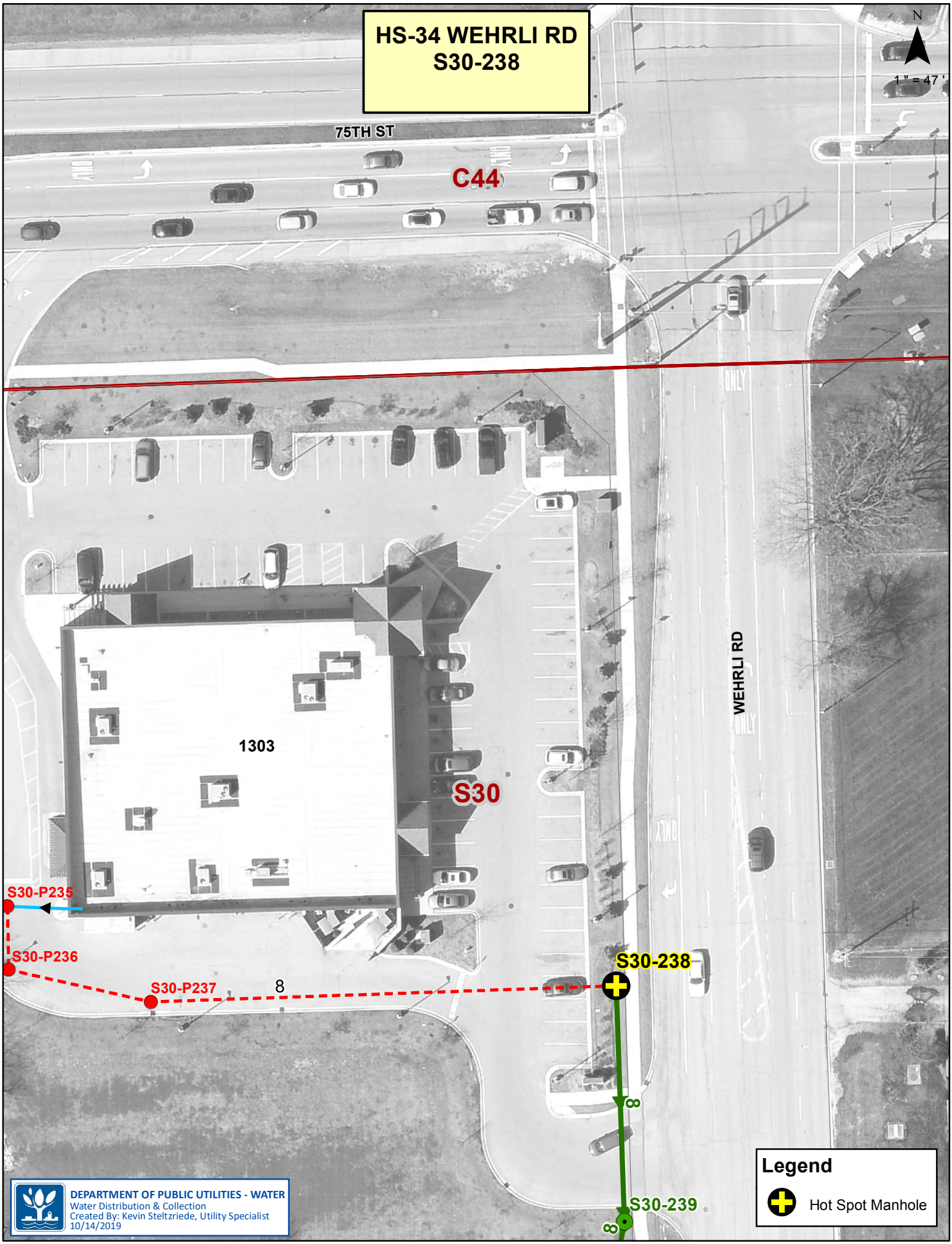
HS-31 SHUMARD LN (4 MH)
W20-011, W20-012, W20-013, W20-014

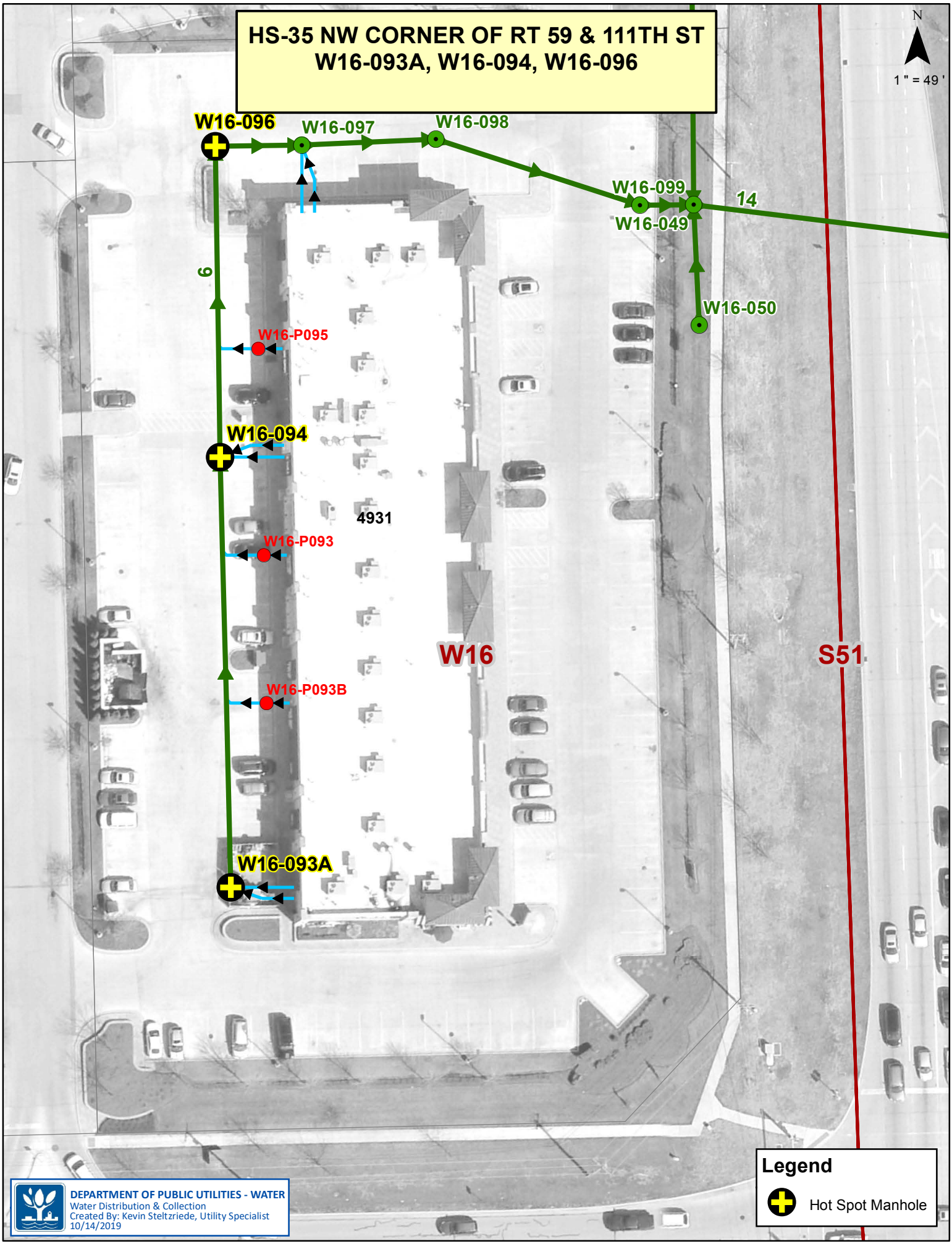
HS-32 5TH AV & MILL ST
N23-004, N23-004B



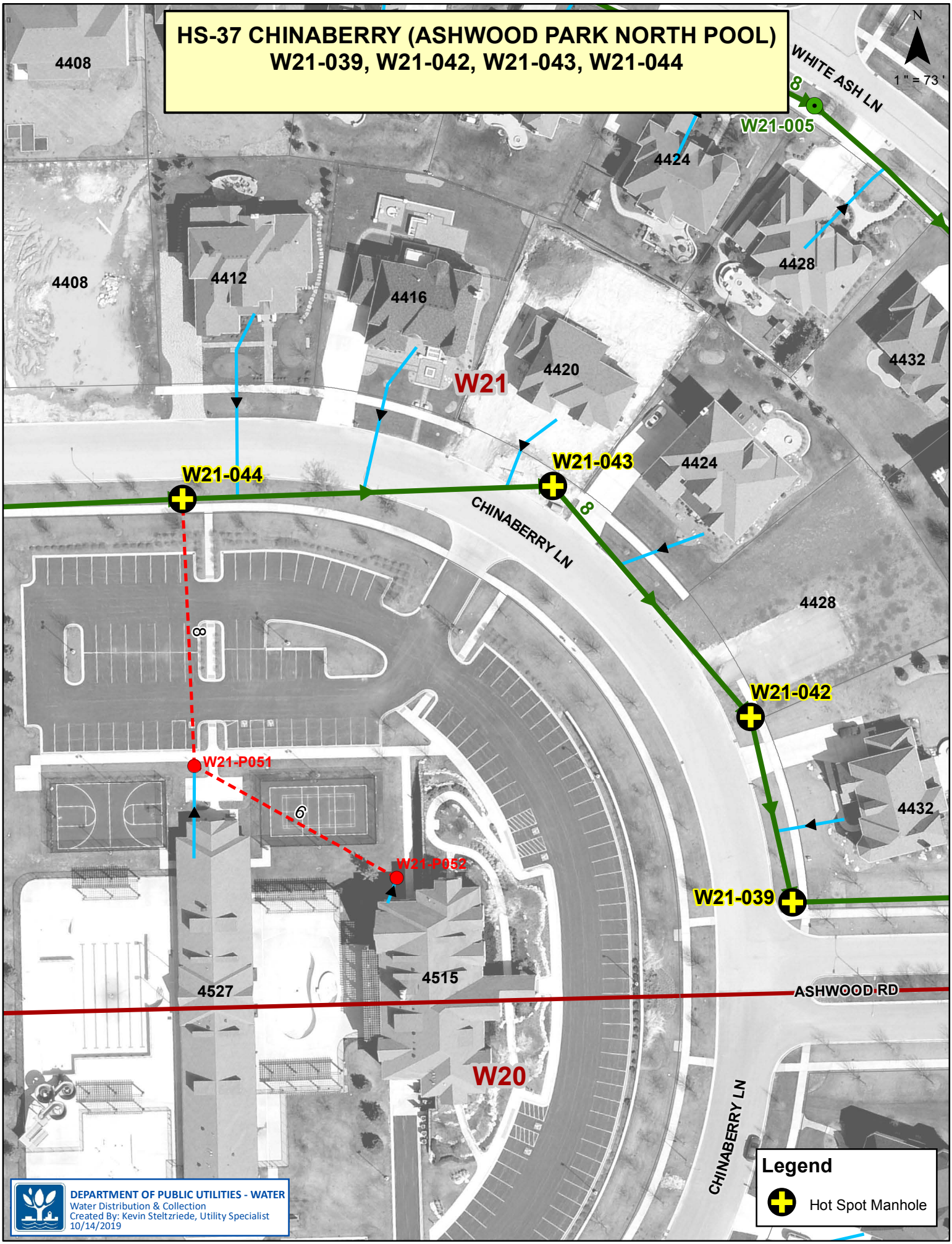
DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019

HS-33 McCARTNEY DR
S14-062, S14-063
N
1 " = 31 '
2279
2276
2281
S14-062
2278
2285
8
2280
2287
S14
2282
MCCARTNEY DR
2289
2284
S14-063
2286
2288
2290
TOWNSEND CR
8
Legend
Hot Spot Manhole
DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019

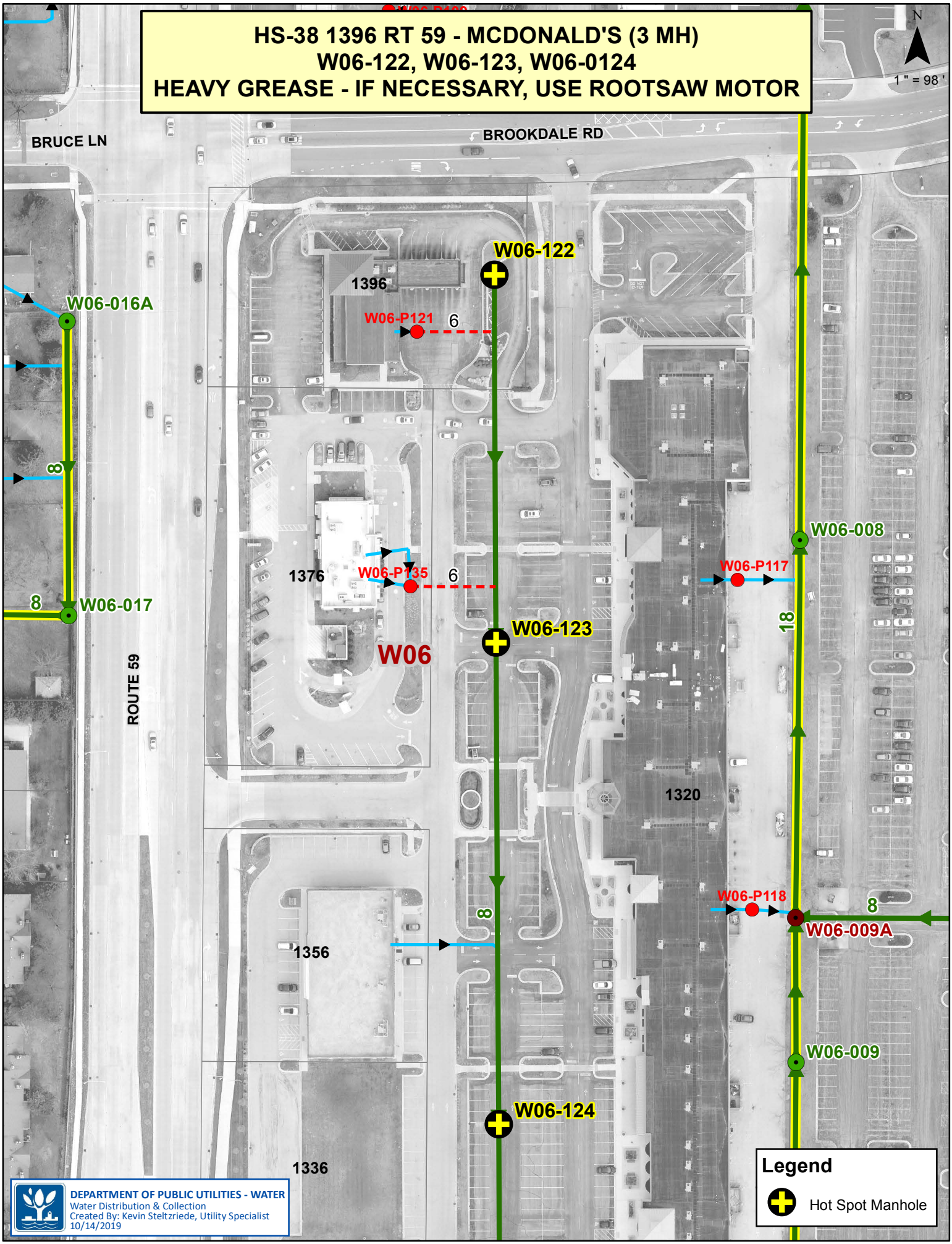

HS-34 WEHRLI RD
S30-238
N
1" = 47'
75TH ST
C44
ONLY
1303
S30
WEHRLI RD
S30-P235
S30-P236
S30-P237
8
S30-238
S30-239
Legend
Hot Spot Manhole
DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019


HS-35 NW CORNER OF RT 59 & 111TH ST
W16-093A, W16-094, W16-096
N
1 " = 49 '
W16-096
W16-097
W16-098
W16-099
W16-049
14
W16-050
9
W16-P095
W16-094
4931
W16-P093
W16
S51
W16-P093B
W16-093A
Legend
Hot Spot Manhole
DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019

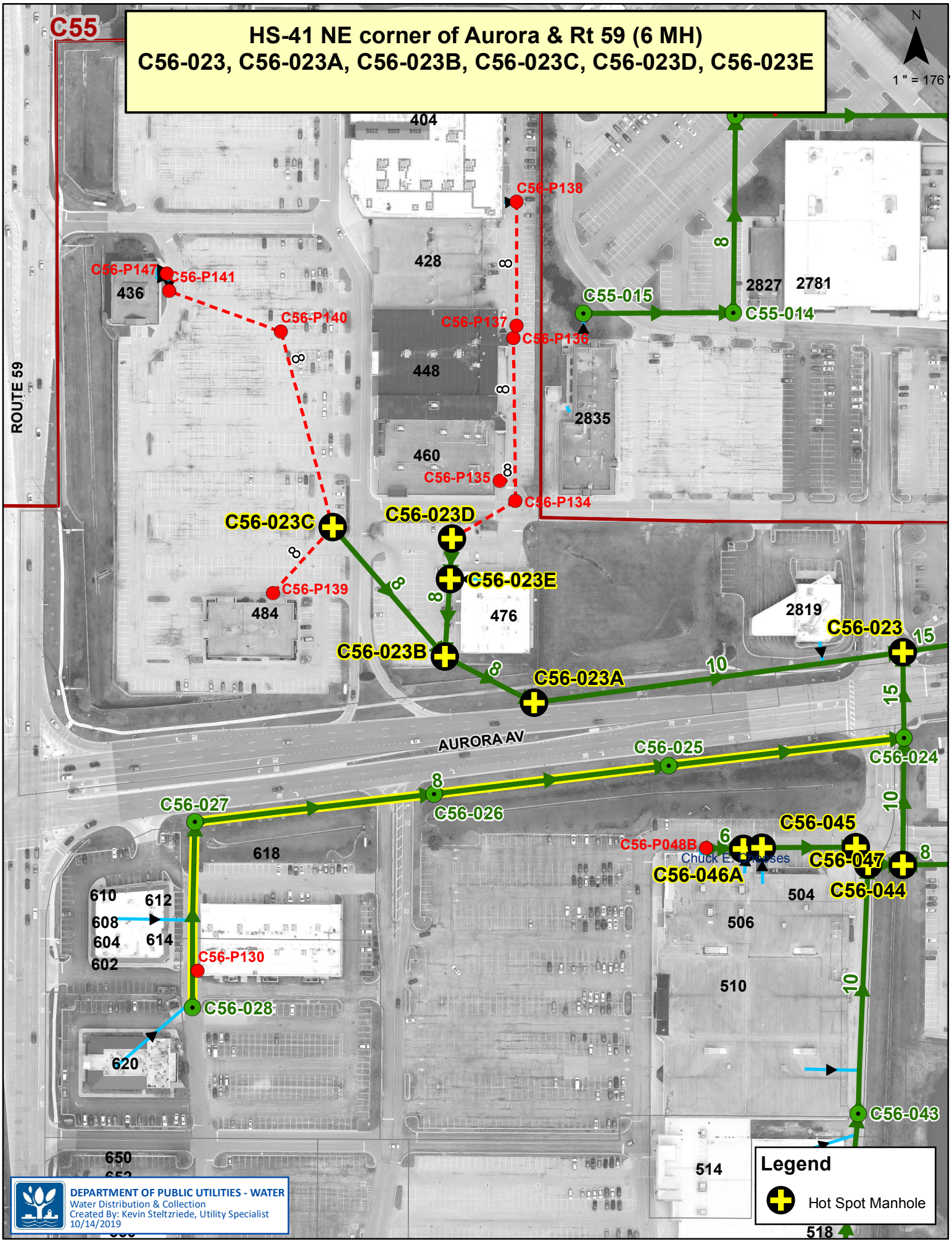
HS-37 CHINABERRY (ASHWOOD PARK NORTH POOL)
W21-039, W21-042, W21-043, W21-044



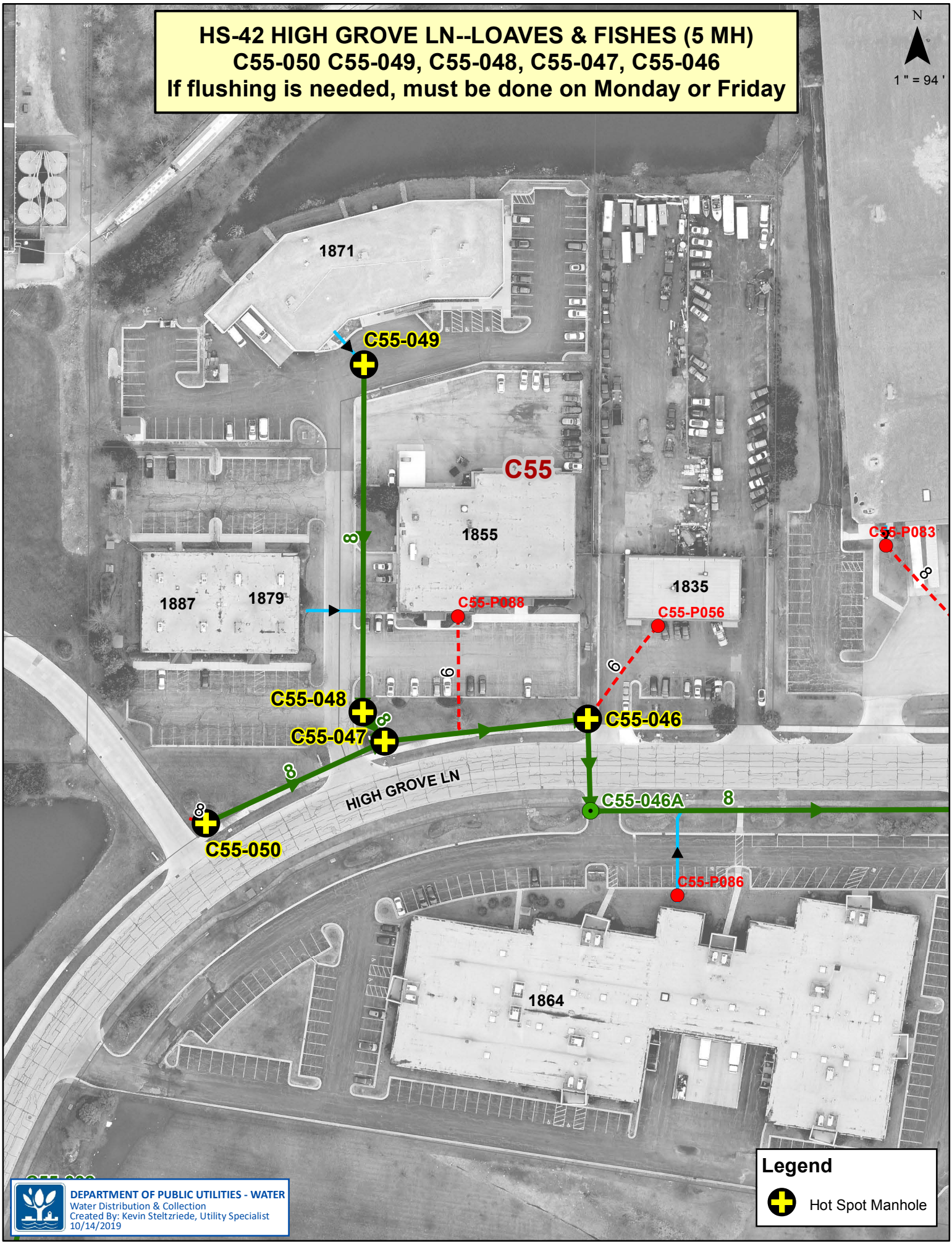
HS-38 1396 RT 59 - MCDONALD'S (3 MH)
W06-122, W06-123, W06-0124
HEAVY GREASE - IF NECESSARY, USE ROOTSAW MOTOR



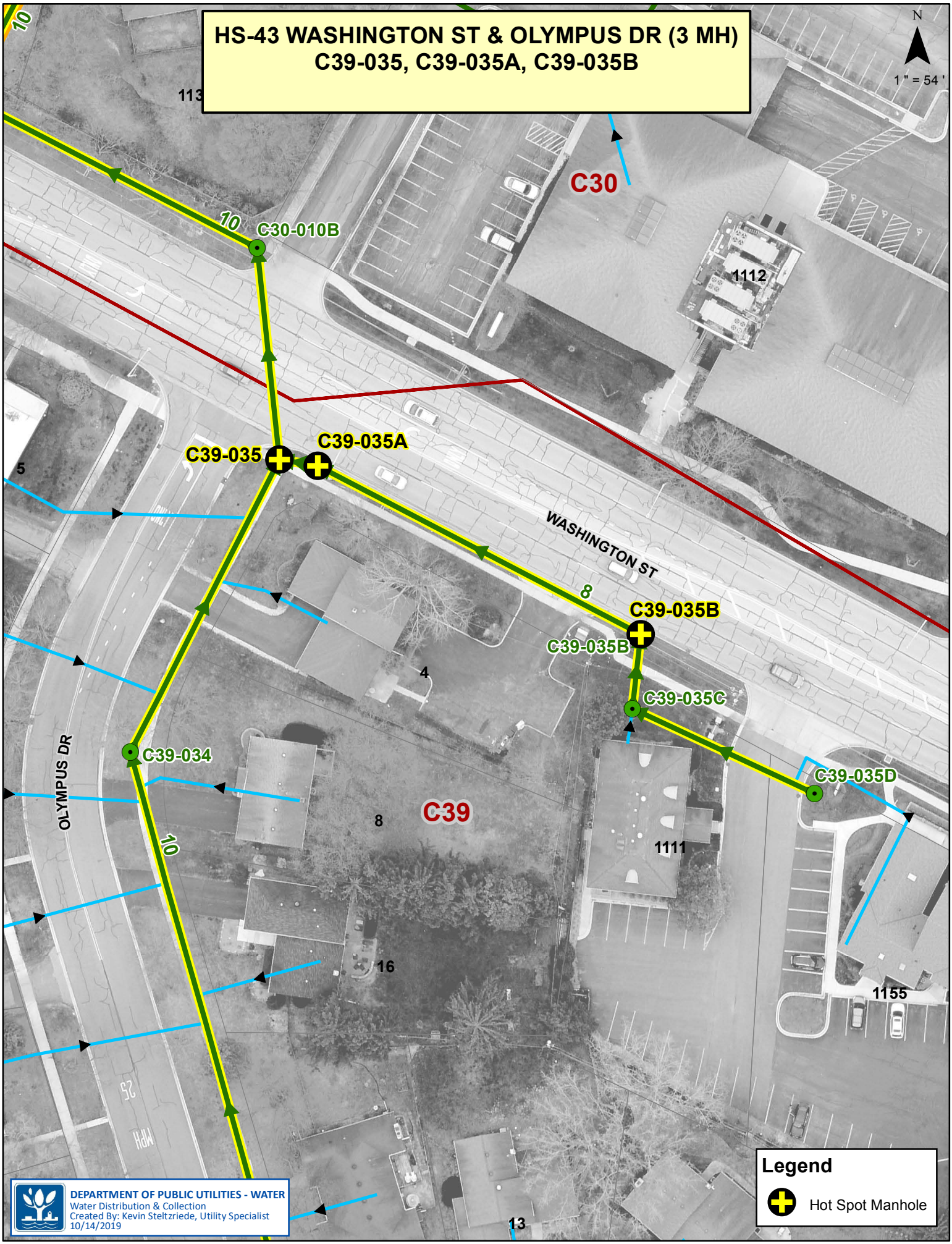
HS-41 NE corner of Aurora & Rt 59 (6 MH)
C56-023, C56-023A, C56-023B, C56-023C, C56-023D, C56-023E



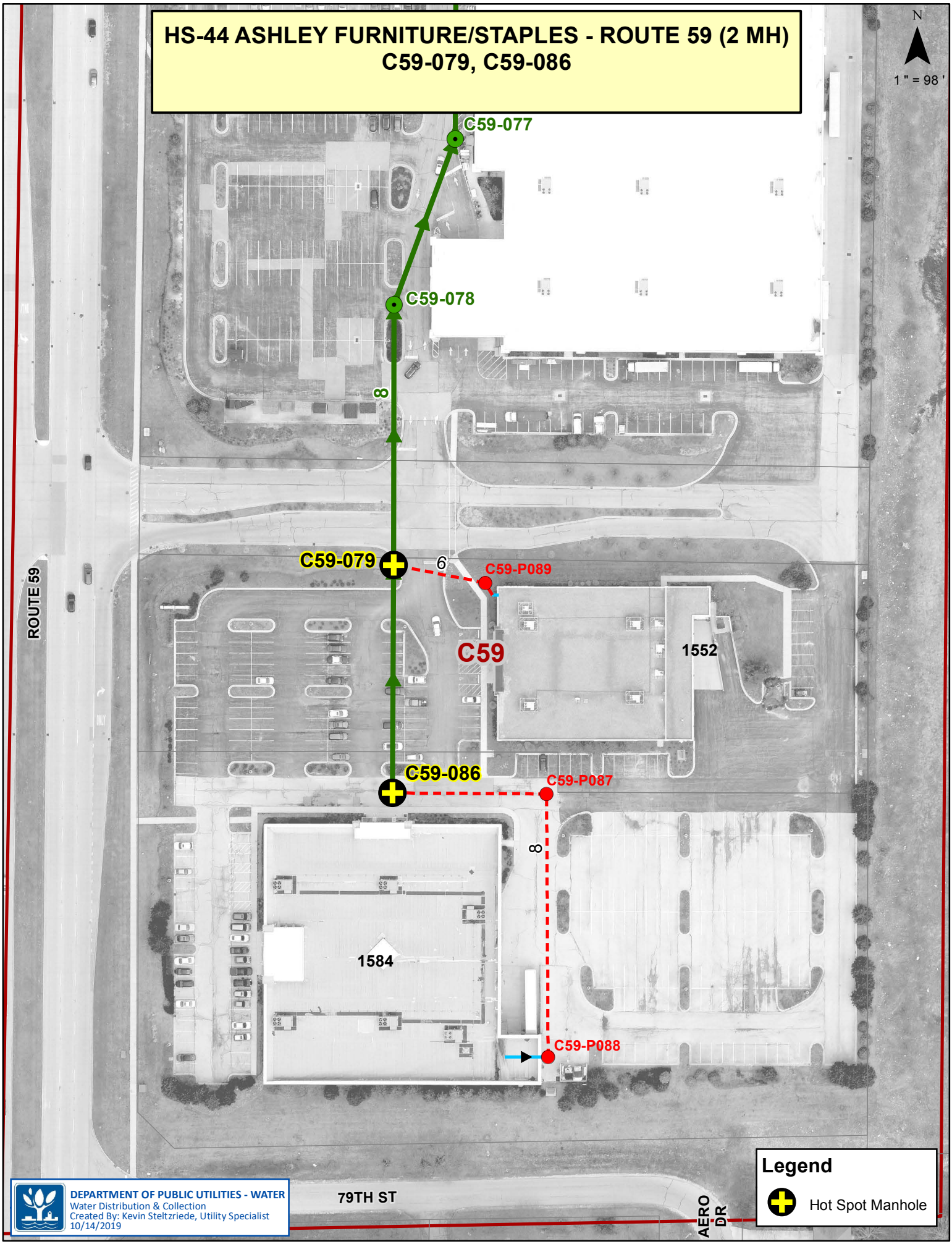
HS-42 HIGH GROVE LN--LOAVES & FISHES (5 MH)
C55-050 C55-049, C55-048, C55-047, C55-046
If flushing is needed, must be done on Monday or Friday



HS-43 WASHINGTON ST & OLYMPUS DR (3 MH)
C39-035, C39-035A, C39-035B



HS-44 ASHLEY FURNITURE/STAPLES - ROUTE 59 (2 MH)
C59-079, C59-086



PREVENTATIVE MAINTENANCE SCHEDULE

	JANUARY	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - **Low Pressure Set** **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77th St		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow

PREVENTATIVE MAINTENANCE SCHEDULE

	FEBRUARY	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - **Low Pressure Set** **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77Th st		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FQ 4	Ogden Mall, Freedom Commons, Diehl Rd		Grease
FQ 15	Rt 59/95th St LaCrosse @ Rt 59		Grease
FQ 17	Showplace - Rt59, north of 95th St		Grease
FQ 22	Tall Grass		Grease

Updated August 2019

PREVENTATIVE MAINTENANCE SCHEDULE

	MARCH	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - **Low Pressure Set** Notify Resident @ 360 Prairie Av		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77th St		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FQ 1	Downtown Jefferson/Main/Jackson Pottery Barn - EARLY AM ONLY		Low Flow
FQ 3	Hobson Mill/Interceptor		Grease & Low Flow
FQ 5	Siphons - 6 Total Hospital/Edgewater/I-88 Cracker Barrel/87th St **Gartner/Bluebird - TAKE BIKE PATH SIGNS**		Grease and Low Flow
FQ 6	Springdale/Windemere/Gateshead/Fireside Ct Notify and/or Open outside cleanout: 2620 Springdale (R. Garavalia 630-778-8155) 1259 Windemere (L. Gallagher 630-428-7621) 1251 & 1304 Windemere - open outside c/o		Grease
FQ 7	Alley on 4th St		Low Flow
FQ 9	Factory Card Outlet		Low Flow
FQ 11	Washington/Ogden		Grease & Low Flow
FQ 13	W06- Allister		Low Flow
FQ 14	Modaff/Gartner		Grease & Low Flow
FQ 16	W25- Idelwild		Low Flow
FQ 18	Massachusets		Grease
FQ 19	American Drive		Grease
FQ 20	South Loomis		Grease & Bellies
FQ 21	Wehrli/Wright		Grease
FS 15	Caputo's Grease Run		Grease
FS 16	1907/1913 Coach Drive		Low Flow
FS 17	Ranchview Dr - Near Cinnamon Creek Lift Station		Grease

PREVENTATIVE MAINTENANCE SCHEDULE

	APRIL	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - Low Pressure Set **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77th St		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FS 1	Highland/Brainard>Chicago		Low Flow
FS 2	Ogden Grease Route also 1st American Bank Set **Notify Phillips Flowers @ 1007 E Ogden**		Grease
FS 3	Naper West Plaza/Fox River Commons **Notify Bank prior to flushing** - Low Pressure Set		Grease
FS 4	Remington/Arlington/Barkdoll		Grease
FS 5	Webster, Main, Porter, Washington, Hillside		Grease & Low Flow
FS 7	Boswell Ln - S40-103>S40-101		Low Flow
FS 8	Market Meadows-Fox River Sq		Grease
FS 9	Bauer at Wedgefield (Cress Creek)		Grease
FS 10	River Bend (C54) to Jefferson		Grease
FS 11	C55 - Westridge Court		Grease
FS 12	Commons-William Penn		Grease
FS 13	C28-050>049 (Rose) Flush -Low Pressure Set		Low Flow
FS 14	12th and Washington - SPINNER NOZZLE		Grease
FS 18	Charles at Cheshire- Offset Joint **Notify Resident @ 1036 Elizabeth**		Grease
RS 1	Douglas/Eagle - 6" blade		Low Flow

Updated August 2019

PREVENTATIVE MAINTENANCE SCHEDULE

	MAY	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - **Low Pressure Set** **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77Th st		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FQ 4	Ogden Mall, Freedom Commons, Diehl Rd		Grease
FQ 15	Rt 59/95th St LaCrosse @ Rt 59		Grease
FQ 17	Showplace - Rt59, north of 95th St		Grease
FQ 22	Tall Grass		Grease

PREVENTATIVE MAINTENANCE SCHEDULE

	JUNE	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - **Low Pressure Set** **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77th St		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FQ 3	Hobson Mill/Interceptor		Grease & Low Flow
FQ 5	Siphons - 6 Total Hospital/Edgewater/I-88 Cracker Barrel/87th St **Gartner/Bluebird - TAKE BIKE PATH SIGNS**		Grease & Low Flow
FQ 6	Springdale/Windemere/Gateshead/Fireside Ct Notify and/or Open outside cleanout: 2620 Springdale (R. Garavalia 630-778-8155) 1259 Windemere (L. Gallagher 630-428-7621) 1251 & 1304 Windemere - open outside c/o		Grease
FQ 7	Alley on 4th St		Low Flow
FQ 9	Factory Card Outlet		Low Flow
FQ 11	Washington/Ogden		Grease & Low Flow
FQ 13	W06- Allister		Low Flow
FQ 14	Modaff/Gartner		Grease & Low Flow
FQ 16	W25- Idelwild		Low Flow
FQ 18	Massachusets		Grease
FQ 19	American Drive		Grease
FQ 20	South Loomis		Grease & Bellies
FQ 21	Wehrli/Wright		Grease

Updated August 2019

PREVENTATIVE MAINTENANCE SCHEDULE

	JULY	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - **Low Pressure Set** **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77th St		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow

PREVENTATIVE MAINTENANCE SCHEDULE

	AUGUST	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - Low Pressure Set **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77Th st		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FQ 4	Ogden Mall, Freedom Commons, Diehl Rd		Grease
FQ 15	Rt 59/95th St LaCrosse @ Rt 59		Grease
FQ 17	Showplace - Rt59, north of 95th St		Grease
FQ 22	Tall Grass		Grease

Updated August 2019

PREVENTATIVE MAINTENANCE SCHEDULE

	SEPTEMBER	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - **Low Pressure Set** Notify Resident @ 360 Prairie Av		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77th St		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FQ 1	Downtown Jefferson/Main/Jackson Pottery Barn - EARLY AM ONLY		Low Flow
FQ 3	Hobson Mill/Interceptor		Grease & Low Flow
FQ 5	Siphons - 6 Total Hospital/Edgewater/I-88 Cracker Barrel/87th St **Gartner/Bluebird - TAKE BIKE PATH SIGNS**		Grease & Low Flow
FQ 6	Springdale/Windemere/Gateshead/Fireside Ct Notify and/or Open outside cleanout: 2620 Springdale (R. Garavalia 630-778-8155) 1259 Windemere (L. Gallagher 630-428-7621) 1251 & 1304 Windemere - open outside c/o		Grease
FQ 7	Alley on 4th St		Low Flow
FQ 9	Factory Card Outlet		Low Flow
FQ 11	Washington/Ogden		Grease & Low Flow
FQ 13	W06- Allister		Low Flow
FQ 14	Modaff/Gartner		Grease & Low Flow
FQ 16	W25- Idelwild		Low Flow
FQ 18	Massachusets		Grease
FQ 19	American Drive		Grease
FQ 20	South Loomis		Grease & Bellies
FQ 21	Wehrli/Wright		Grease
FS 15	Caputo's Grease Run		Grease
FS 16	1907/1913 Coach Drive		Low Flow
FS 17	Ranchview Dr - Near Cinnamon Creek Lift Station		Grease

Updated August 2019

PREVENTATIVE MAINTENANCE SCHEDULE

	OCTOBER	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - Low Pressure Set **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77th St		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FS 1	Highland/Brainard>Chicago		Low Flow
FS 2	Ogden Grease Route also 1st American Bank Set **Notify Phillips Flowers @ 1007 E Ogden**		Grease
FS 3	Naper West Plaza/Fox River Commons **Notify Bank prior to flushing** - Low Pressure Set		Grease
FS 4	Remington/Arlington/Barkdoll		Grease
FS 5	Webster, Main, Porter, Washington, Hillside		Grease & Low Flow
FS 7	Boswell Ln - S40-103>S40-101		Low Flow
FS 8	Market Meadows-Fox River Sq		Grease
FS 9	Bauer at Wedgefield (Cress Creek)		Grease
FS 10	River Bend (C54) to Jefferson		Grease
FS 11	C55 - Westridge Court		Grease
FS 12	Commons-William Penn		Grease
FS 13	C28-050>049 (Rose) Flush -Low Pressure Set		Low Flow
FS 14	12th and Washington - SPINNER NOZZLE		Grease
FS 18	Charles at Cheshire- Offset Joint **Notify Resident @ 1036 Elizabeth**		Grease
RS 1	Douglas/Eagle - 6" blade		Low Flow

Updated August 2019

PREVENTATIVE MAINTENANCE SCHEDULE

	NOVEMBER	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - **Low Pressure Set** **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77Th st		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FQ 4	Ogden Mall, Freedom Commons, Diehl Rd		Grease
FQ 15	Rt 59/95th St LaCrosse @ Rt 59		Grease
FQ 17	Showplace - Rt59, north of 95th St		Grease
FQ 22	Tall Grass		Grease

Updated August 2019

PREVENTATIVE MAINTENANCE SCHEDULE

	DECEMBER	WO#	REASON
Designation:	**Location:**	**Date Completed:**	
FM 2	Washington St: 5th Av - 6th Av		Low Flow
FM 3	Dean's/Heaven on 7		Grease
FM 4	Chicago Av: Washington St - Main St		Grease
FM 5	Latern Siphon & Hillside Siphon (bi-monthly)		Grease & Low Flow
FM 6	Willow Rd/Golden Larch Ct		Low Flow
FM 7	Hillside Rd: Julian St - Wright St		Low Flow
FM 8	Victoria Ct - **Low Pressure Set** **Notify Resident @ 360 Prairie Av**		Low Flow
FM 9	Spencer Ct - Low Pressure Set (bi-monthly)		Low Flow
FM 10	Watercress Ct		Grease & Low Flow
FM 11	2559 Bangert Ln (Basin S63)		Low Flow
FM 13	North Aurora Rd/Railway/Amerisale		Grease
FM 14	Comstock Ct		Low Flow
FM 16	SE corner Bond & Brookdale (Silverado Senior Living)		Low Flow
FM 17	1603 77th St		Low Flow
FM 18	Abriter Ct, Diehl Rd, Centre Pointe Dr		Grease
FM 19	5th Av Station		Low Flow
FM 20	Bourbon Ct/Elyse Ln		Flat/Low Flow
FQ 1	Downtown Jefferson/Main/Jackson Pottery Barn - EARLY AM ONLY		Low Flow
FQ 3	Hobson Mill/Interceptor		Grease & Low Flow
FQ 5	Siphons - 6 Total Hospital/Edgewater/I-88 Cracker Barrel/87th St **Gartner/Bluebird - TAKE BIKE PATH SIGNS**		Grease & Low Flow
FQ 6	Springdale/Windemere/Gateshead/Fireside Ct Notify and/or Open outside cleanout: 2620 Springdale (R. Garavalia 630-778-8155) 1259 Windemere (L. Gallagher 630-428-7621) 1251 & 1304 Windemere - open outside c/o		Grease
FQ 7	Alley on 4th St		Low Flow
FQ 9	Factory Card Outlet		Low Flow
FQ 11	Washington/Ogden		Grease & Low Flow
FQ 13	W06- Allister		Low Flow
FQ 14	Modaff/Gartner		Grease & Low Flow
FQ 16	W25- Idelwild		Low Flow
FQ 18	Massachusets		Grease
FQ 19	American Drive		Grease
FQ 20	South Loomis		Grease & Bellies
FQ 21	Wehrli/Wright		Grease

Updated August 2019

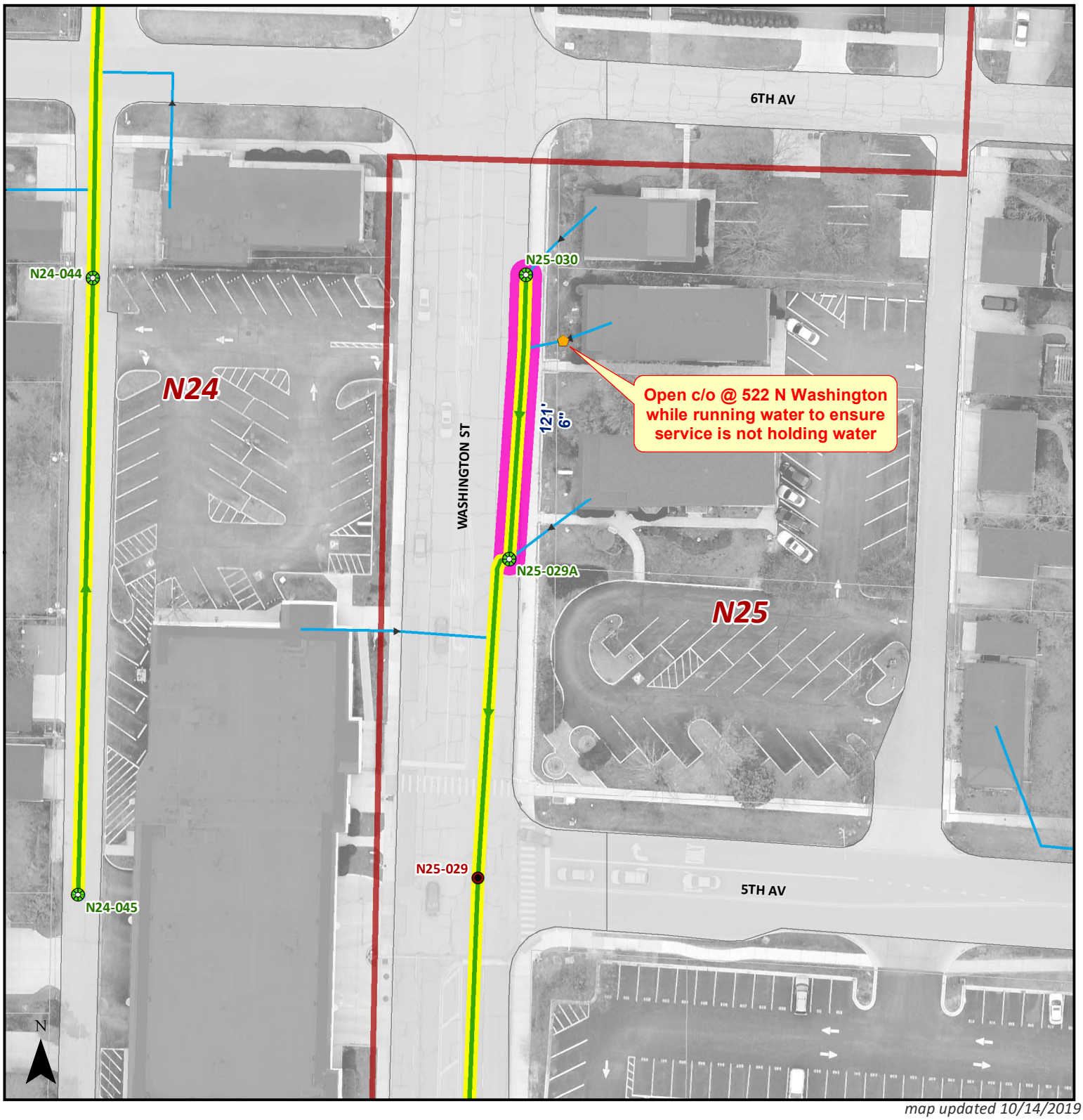
SANITARY FLUSHING PMS

PMS CHECK: FM-2 **Location: Washington - 6th Av to 5th Av**

Sets: N25-030>N25-029A

Description and Procedures

Set- up facing west on the NE corner of 6th Av/ Washington St (Stay off Washington). Pull hose with no nozzle to manhole N25-030 (526 S. Washington St). Run water into manhole until line flows clear. If line won't clear, contact Field Supervisor and flush from Washington/5th.



map updated 10/14/2019

SANITARY FLUSHING PMS

PMS CHECK: FM-3 **Location: 224 - 226 S. Main St**

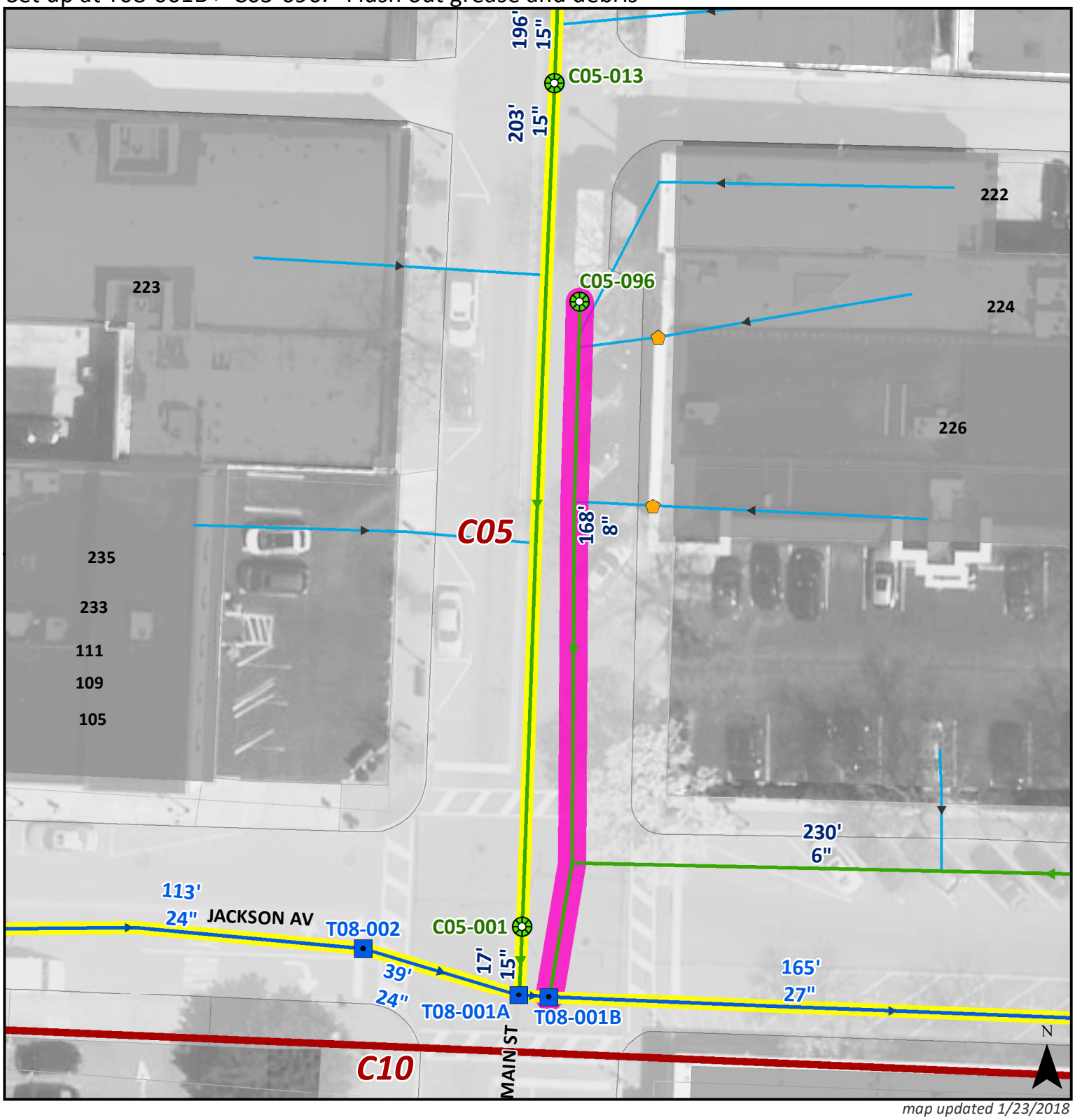
(7 on Heaven Restaurant and Dean's Clothing Store)

Sets: C05-096>C05-T08-001B

Description and Procedures

They share a common service. Need to flush out grease and debris.

Set up at T08-001B > C05-096. Flush out grease and debris



map updated 1/23/2018

SANITARY FLUSHING PMS

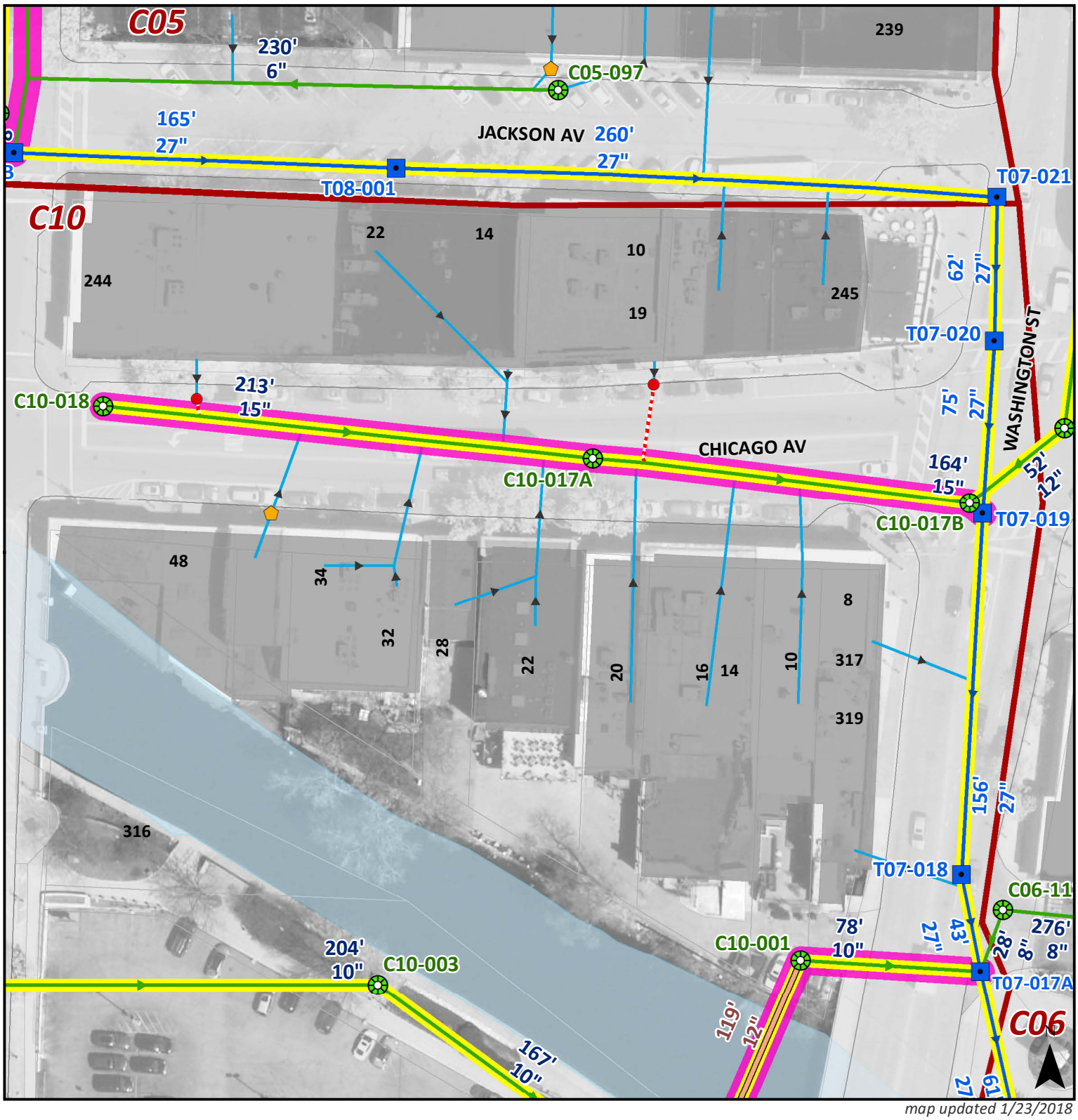
PMS CHECK: FM-4 **Location: Chicago Av - Washington St to Main St**

Sets: C10-018 to C10-017A C10-017A to C10-017B C10-017B to T07-019

Description and Procedures

USE #777 DUE TO TRAFFIC

Set up on Southbound Washington St, and flush 3 sets to the west. Flush during low traffic hours. Use arrow board, cones, and flagman. **Heavy Grease**



map updated 1/23/2018

SANITARY FLUSHING PMS

PMS CHECK: FM-5 **Location: Hillside Siphon**

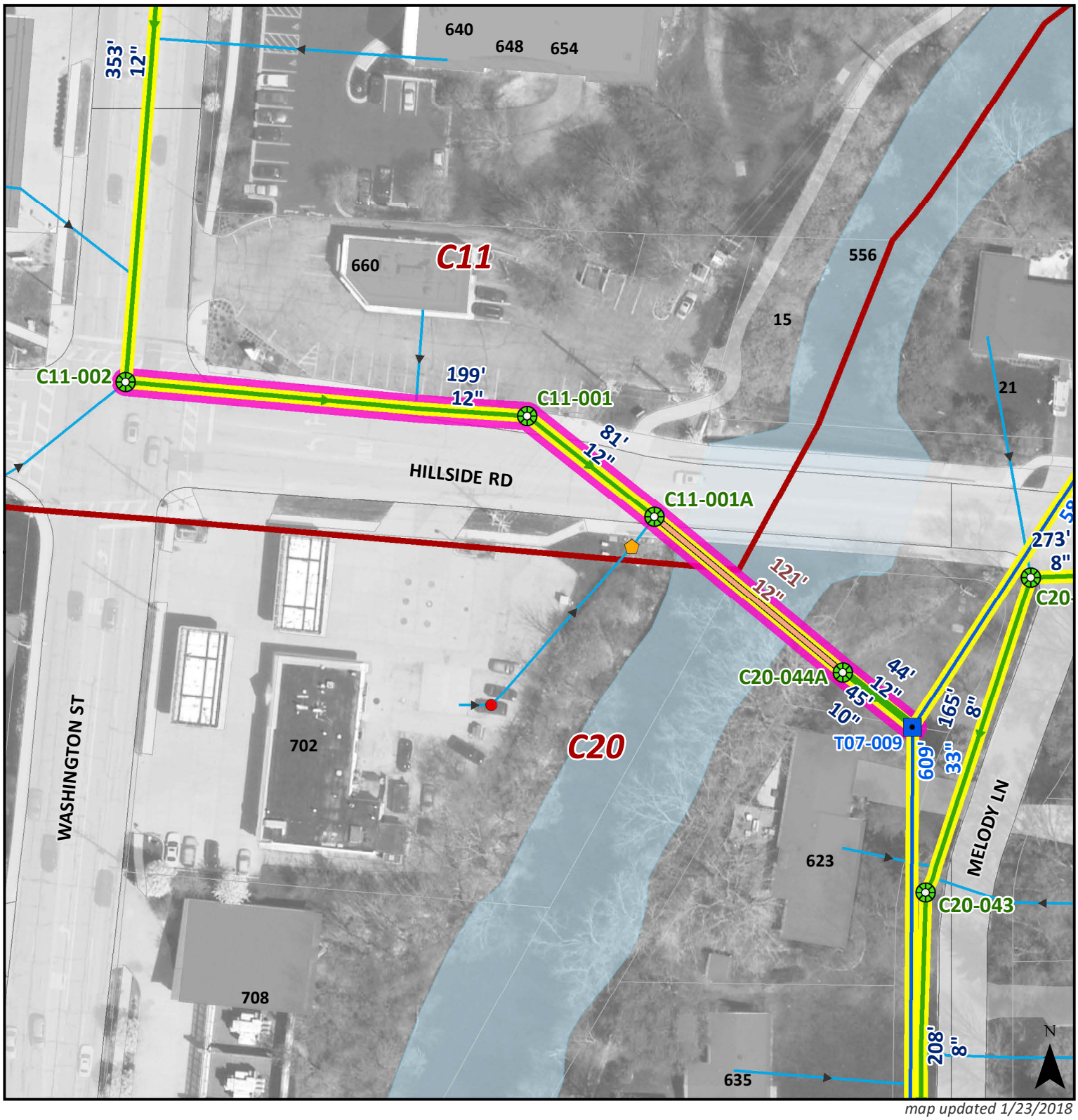
Sets: C11-002 >C11-001 C11-001>C11-001A C11-001A>C20-044A C20-044A>T07-009

Description and Procedures

****FLUSH EVERY TWO WEEKS****

Vac Manhole C11-001A

Mix up Manhole C20-044A - 2 barrels



map updated 1/23/2018

SANITARY FLUSHING PMS

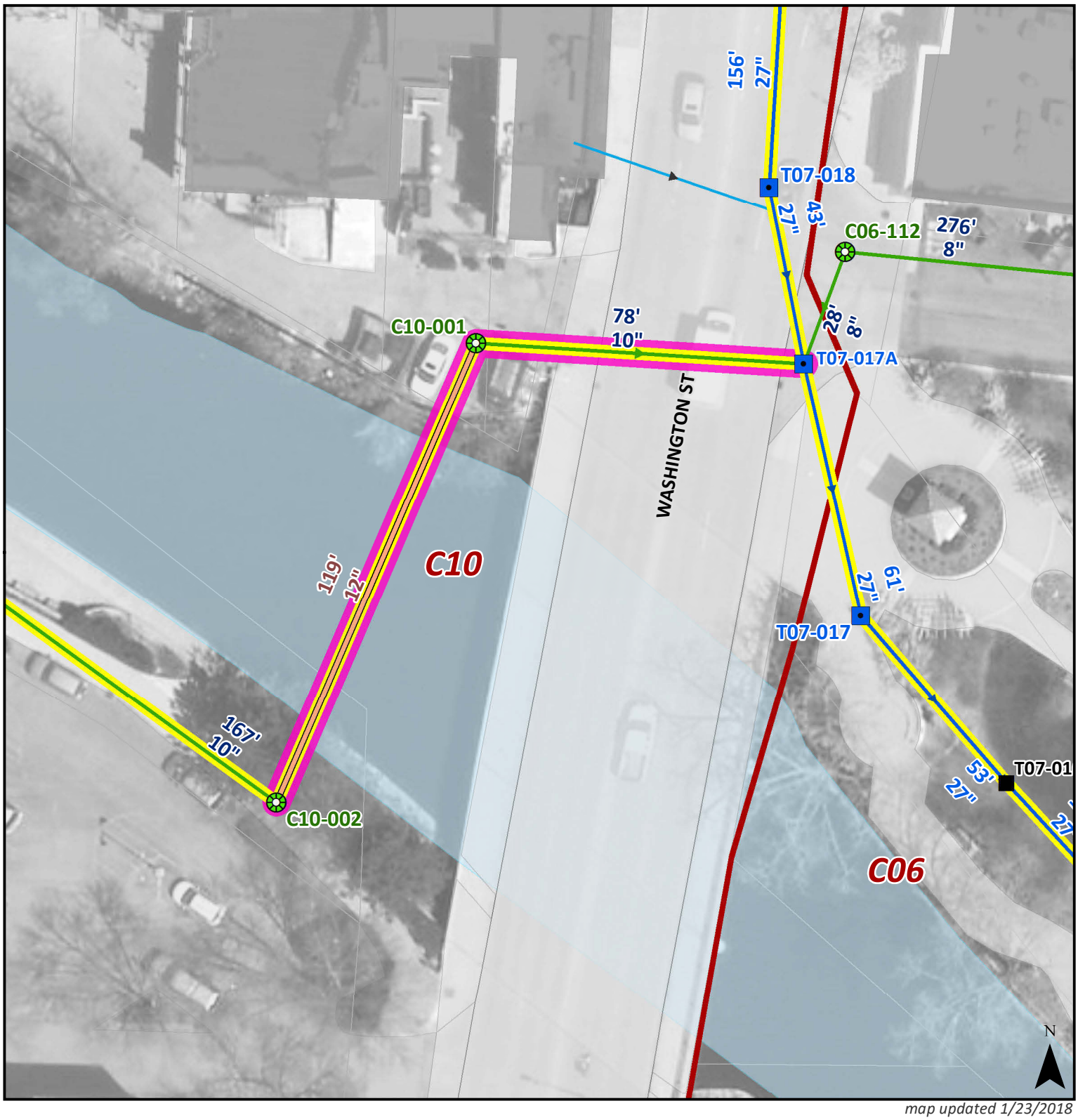
PMS CHECK: FM-5

Location: Lantern Siphon (Washington St - Behind Lantern)

Sets: C10-002>C10-001 C10-001>T07-017A

Description and Procedures

Washington St, behind the Lantern at the river



map updated 1/23/2018

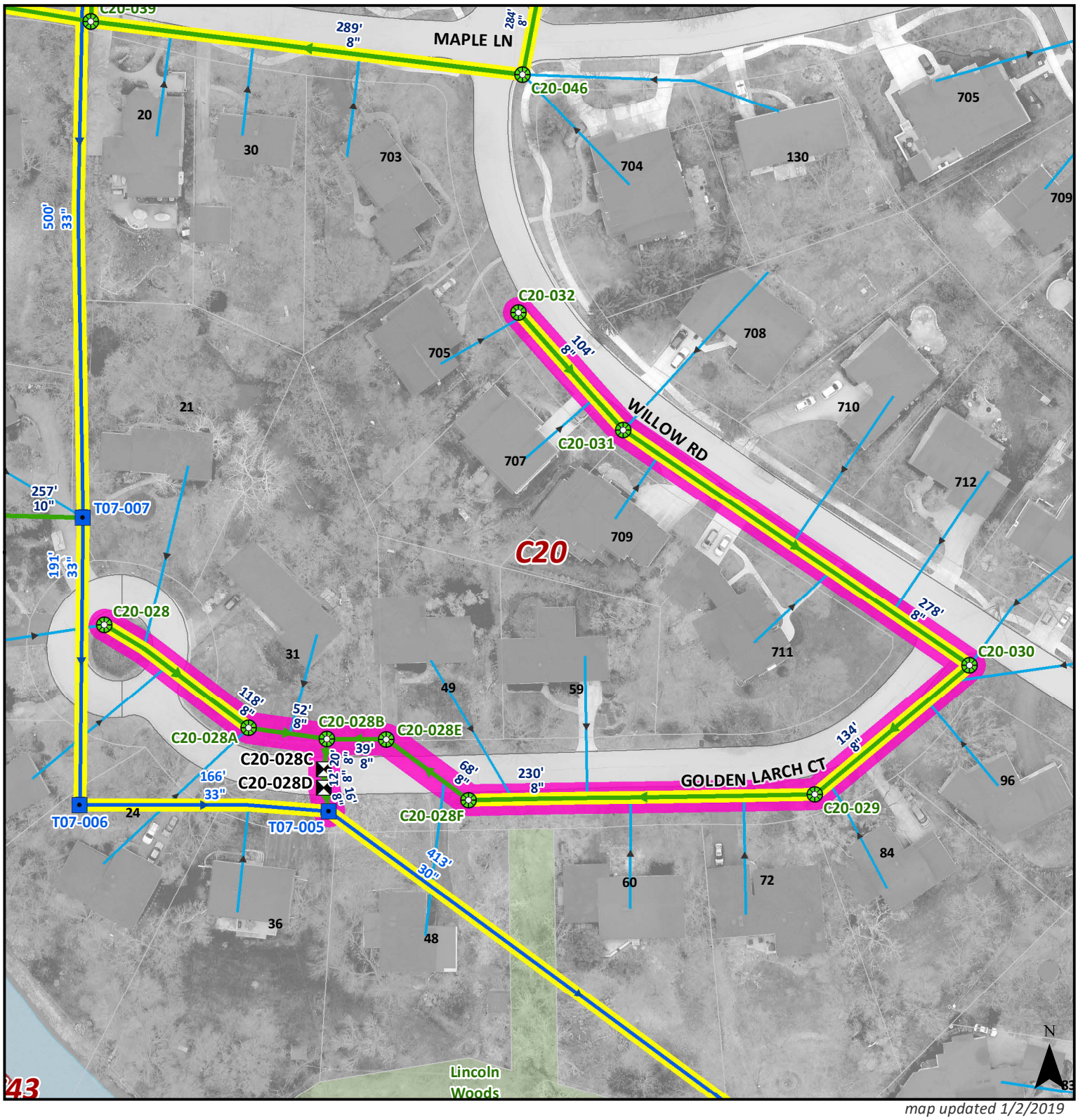
SANITARY FLUSHING PMS

PMS CHECK: FM-6 **Location: Willow/Golden Larch**

Sets: C20-032>031
031>030
030>029
029>028F
028F>028E
028E>028B
028>028A
028A>028B
028B>028C/028D (BPS - Eveready MHs ⧓)
028D>T05-005

Description and Procedures

Run Flusher until pump pits (028C and 028 D) at Golden Larch and Eveready System are clear



map updated 1/2/2019

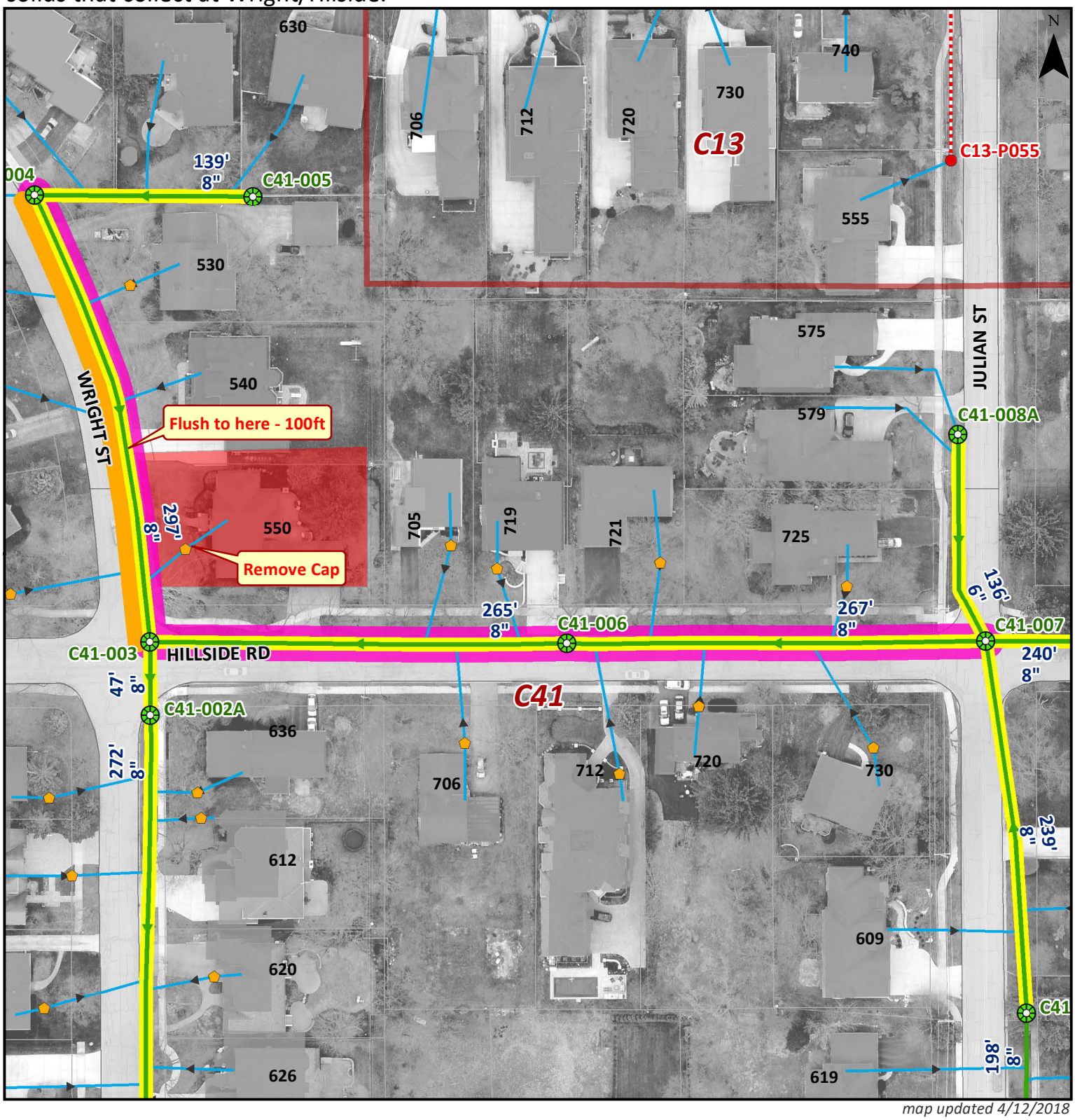
SANITARY FLUSHING PMS

PMS CHECK: FM-7 **Location: Hillside- Julian to Wright**

Sets: C41-007>C41-006>C41-003
C41-003 to 100ft north toward C41-004 **(Low Pressure)**

Description and Procedures

Set up at Hillside and Wright and flush 2 sets east to Hillside/Julian. **Flat line - Collects solids**
Remove cleanout cap at 550 S Wright St, then flush up 100ft toward MH C41-004 on Wright to clear solids that collect at Wright/Hilside.



map updated 4/12/2018

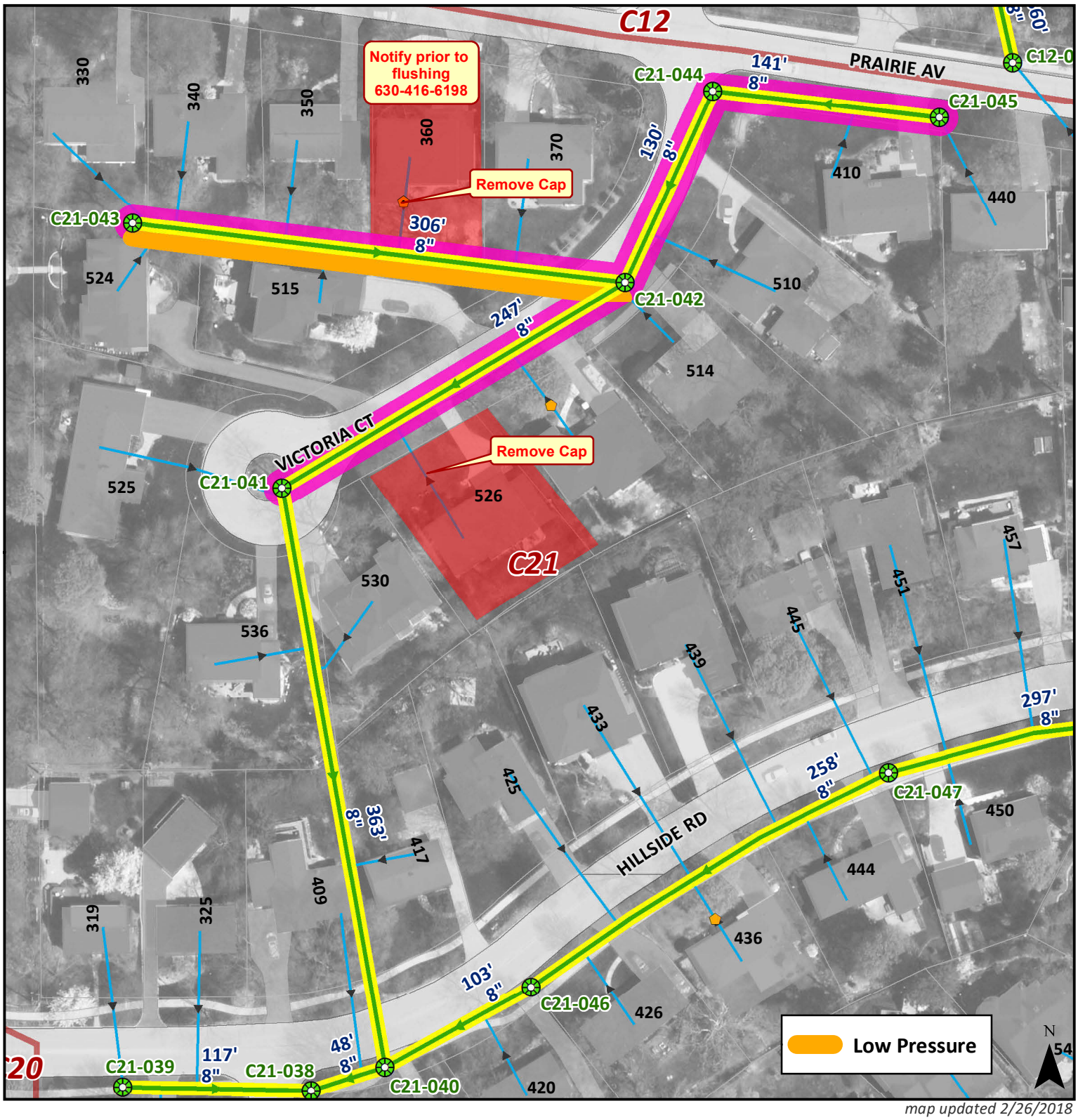
SANITARY FLUSHING PMS

PMS CHECK: FM-8 **Location: Victoria Court**

Sets: C21-045>C21-044 C21-044>C-21-042 C21-042>C21-041
C21-043>C21-042 **(Low Pressure)**

Description and Procedures

Flush Prairie Line (045-044) and behind homes (043-042) into Victoria Ct to MH 041 - If needed flush to Hillside. Notify resident at 360 Prairie and remove cleanout caps at 360 Prarie and 526 Victoria Ct



map updated 2/26/2018

SANITARY FLUSHING PMS

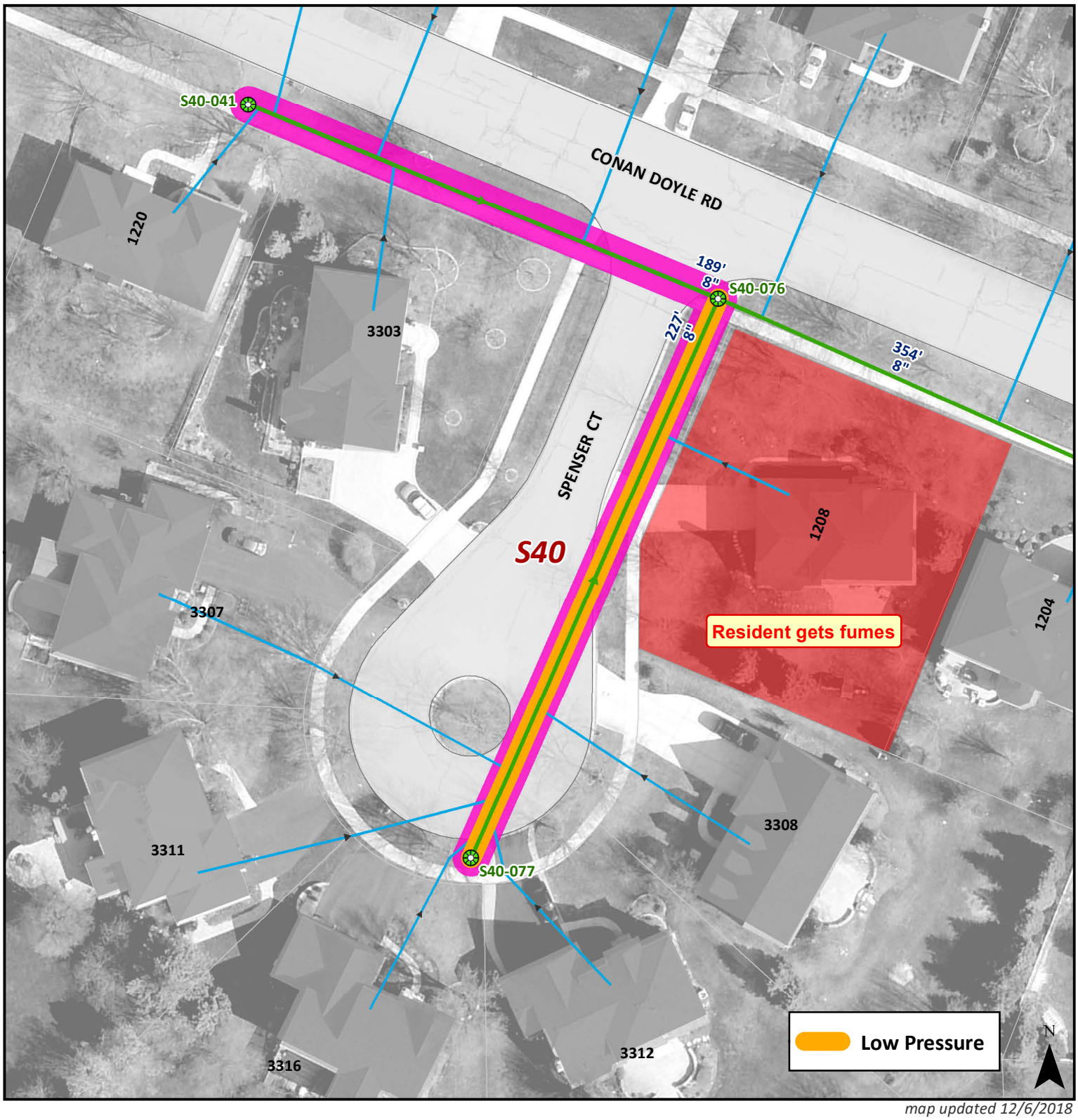
PMS CHECK: FM-9 **Location: Spenser Ct**

Sets: S40-041>S40-076 S40-077>S40-076 **(Low Pressure)**

Description and Procedures

FLUSH EVERY TWO WEEKS

Flush Spenser Ct line (077-076) **(Low Pressure)** Resident at 1208 Conan Doyle gets fumes



map updated 12/6/2018

SANITARY FLUSHING PMS

PMS CHECK: FM-10 **Location: Watercress Ct**

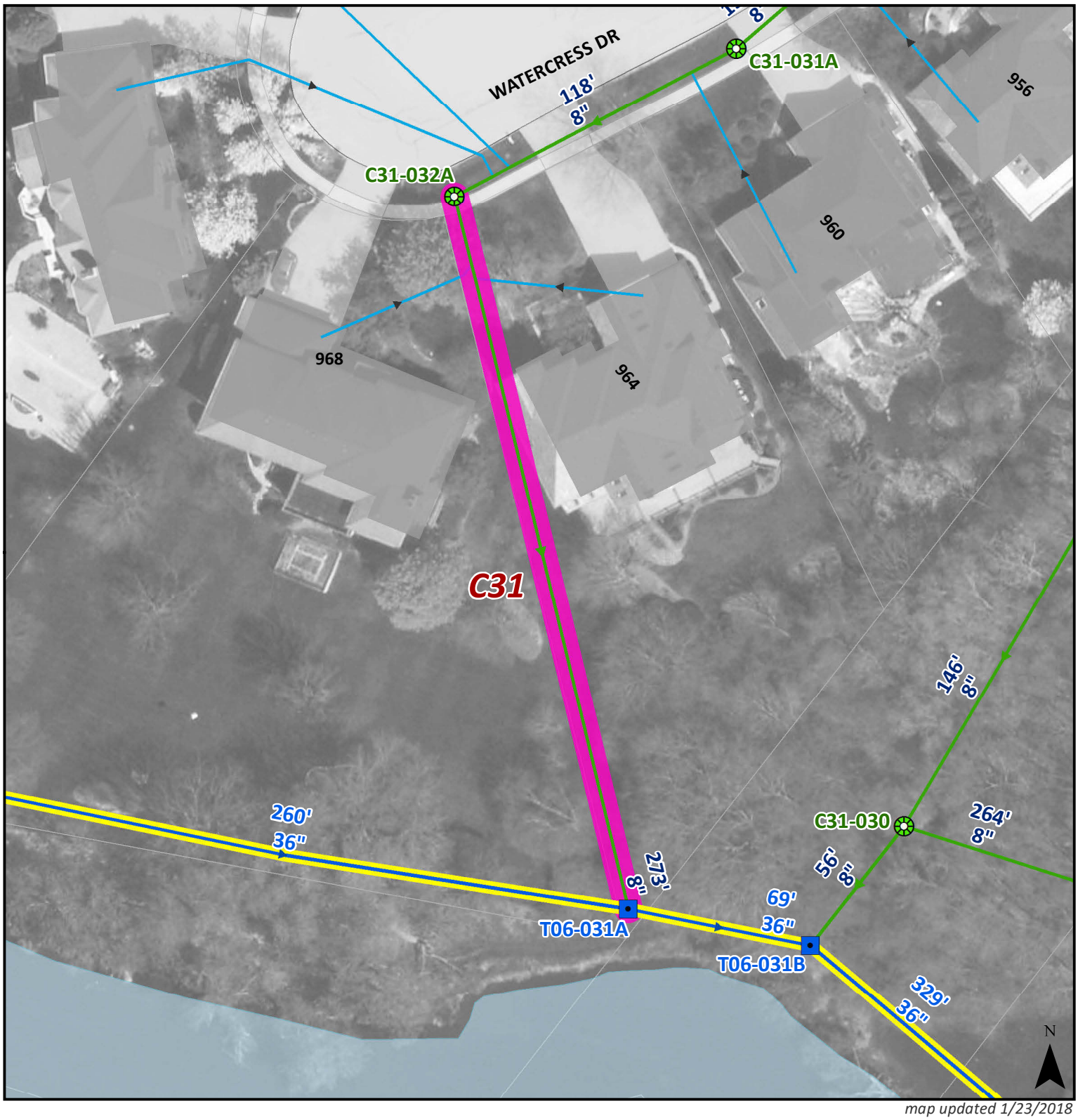
Sets: C31-032A to T06-031A

Description and Procedures

4 man pull hose to backyard and rootsaw entire line.

T06-031A is a Lifespan lid

DO NOT REVERSE FLUSH



map updated 1/23/2018

SANITARY FLUSHING PMS

PMS CHECK: FM-11 **Location: 2559 Bangert Ln**

Sets: S63-021>S23-022

Description and Procedures

Flush 1 set: 021 to 022

map updated 12/6/2018

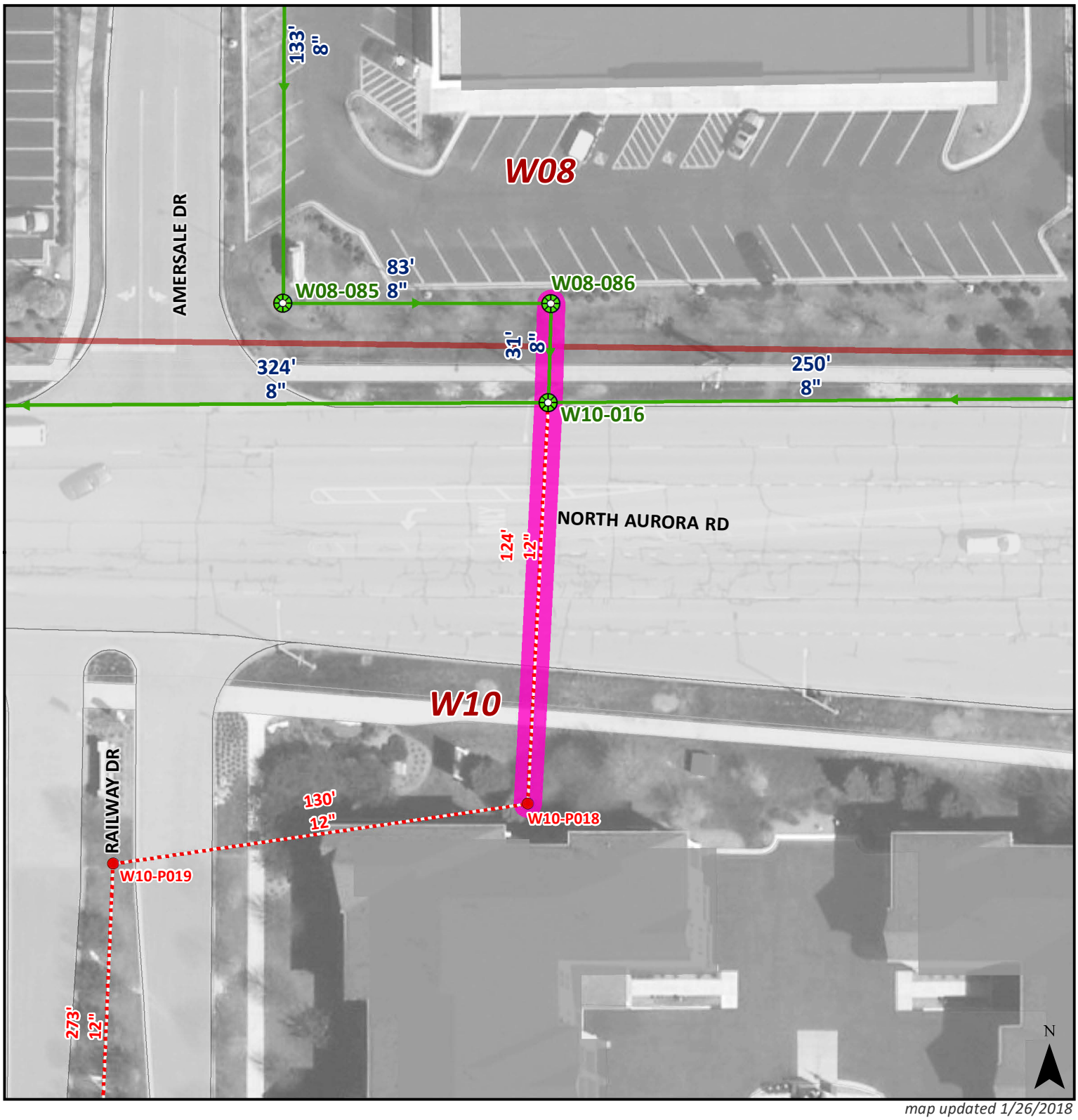
SANITARY FLUSHING PMS

PMS CHECK: FM-13 **Location: North Aurora and Route 59**

Sets: W08-086>W10-016 W10-016>W10-P018

Description and Procedures

Flush W10-P018 to W10-016 and W08-086 to W10-016



map updated 1/26/2018

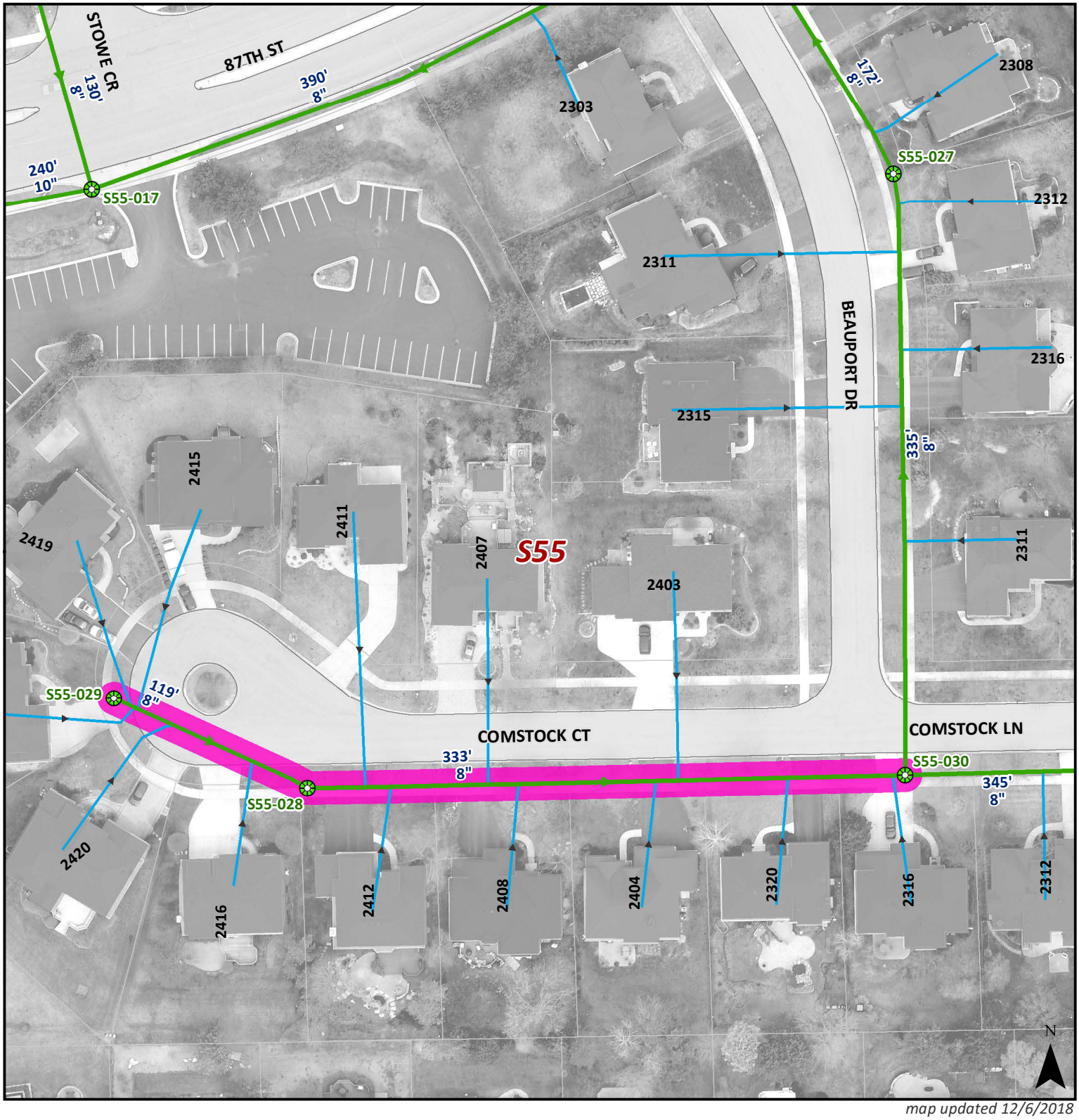
SANITARY FLUSHING PMS

PMS CHECK: FM-14 **Location: Comstock Ct and Beauport Rd**

Sets: S55-029>S55-028 S55-028>S55-030

Description and Procedures

Flush S55-029 to S55-028 and S55-028 to S55-030



map updated 12/6/2018

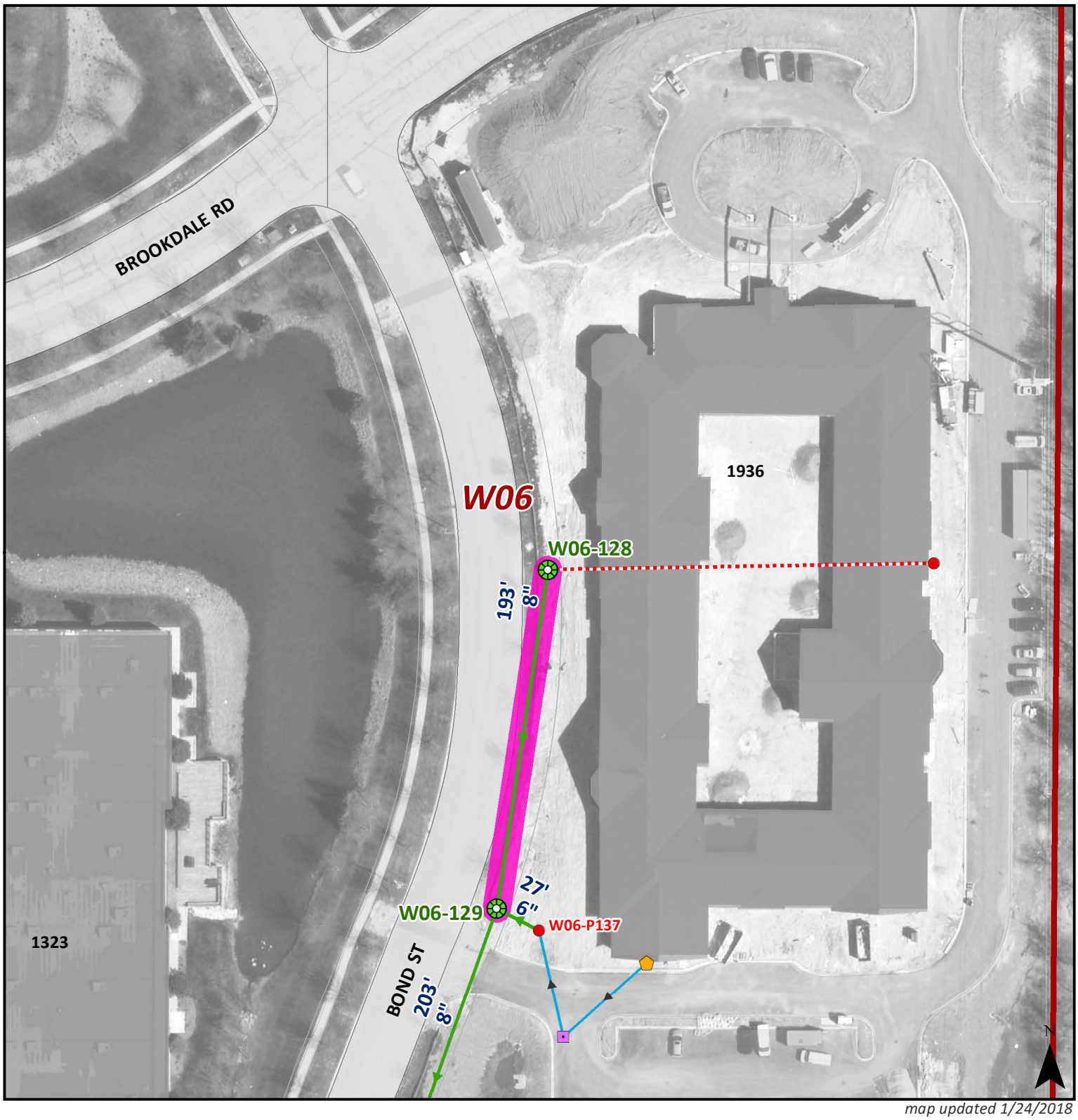
SANITARY FLUSHING PMS

PMS CHECK: FM-16

Location: 1936 Brookdale Rd
Silverado Senior Living

W06-128>W06-129

Description and Procedures
Flush set and vaccuum out at W06-129



map updated 1/24/2018

SANITARY FLUSHING PMS

PMS CHECK: FM-17 **Location: 1603 and 1611 77th St**

Set: S30-203>S30-202

Description and Procedures

1603 77th St has FLAT service - holds rags from cleanout to main

map updated 1/24/2018

SANITARY FLUSHING PMS

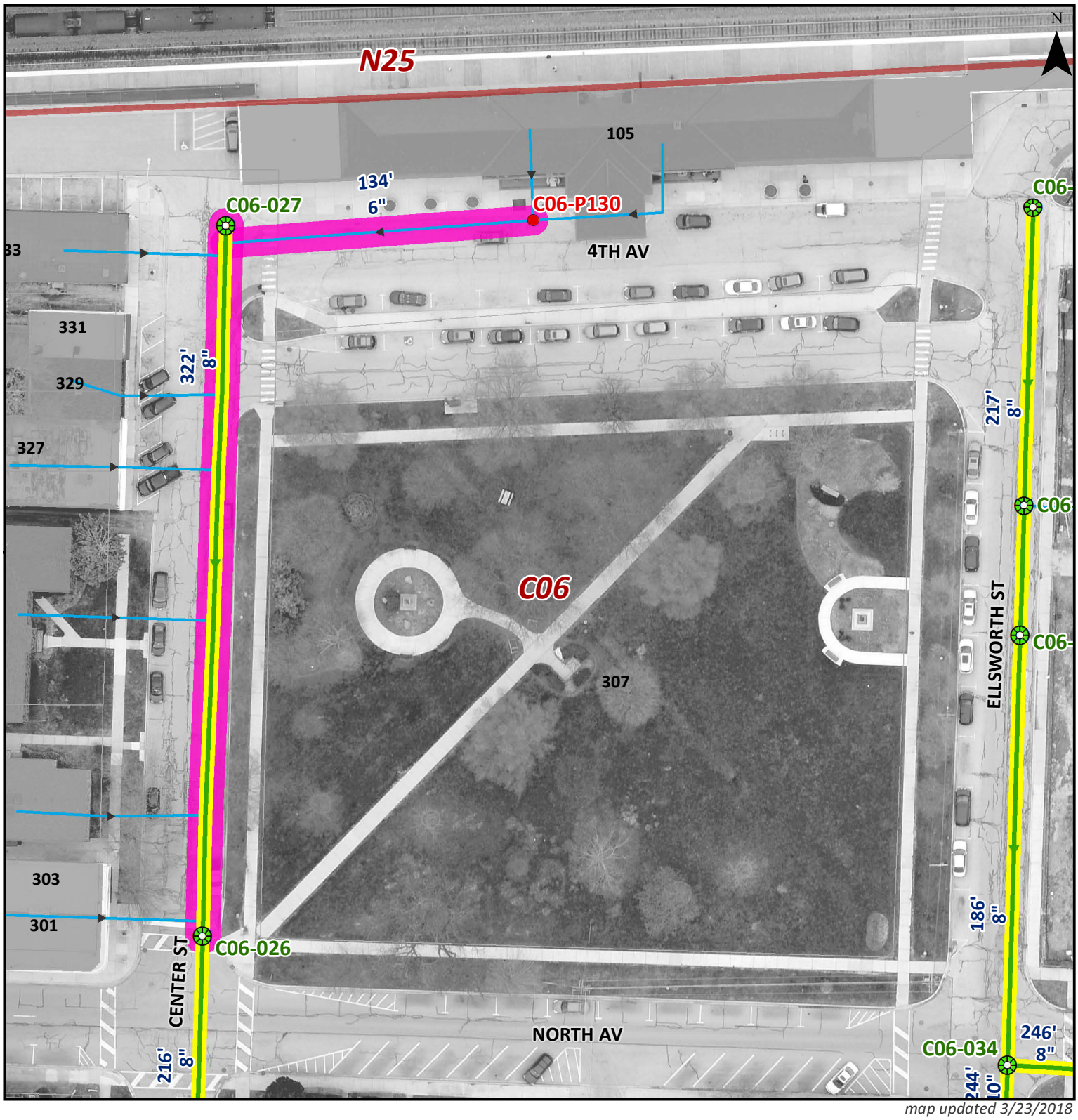
PMS CHECK: FM-19 **Location: 5th Av Station**

Sets: C06-P130 > Blind Service Connection
C06-027 > C06-026

Description and Procedures

Set up at C06-P130 and reverse flush to blind service connection

Set up at C06-026 and flush C06-027 > C06-026



map updated 3/23/2018

SANITARY FLUSHING PMS

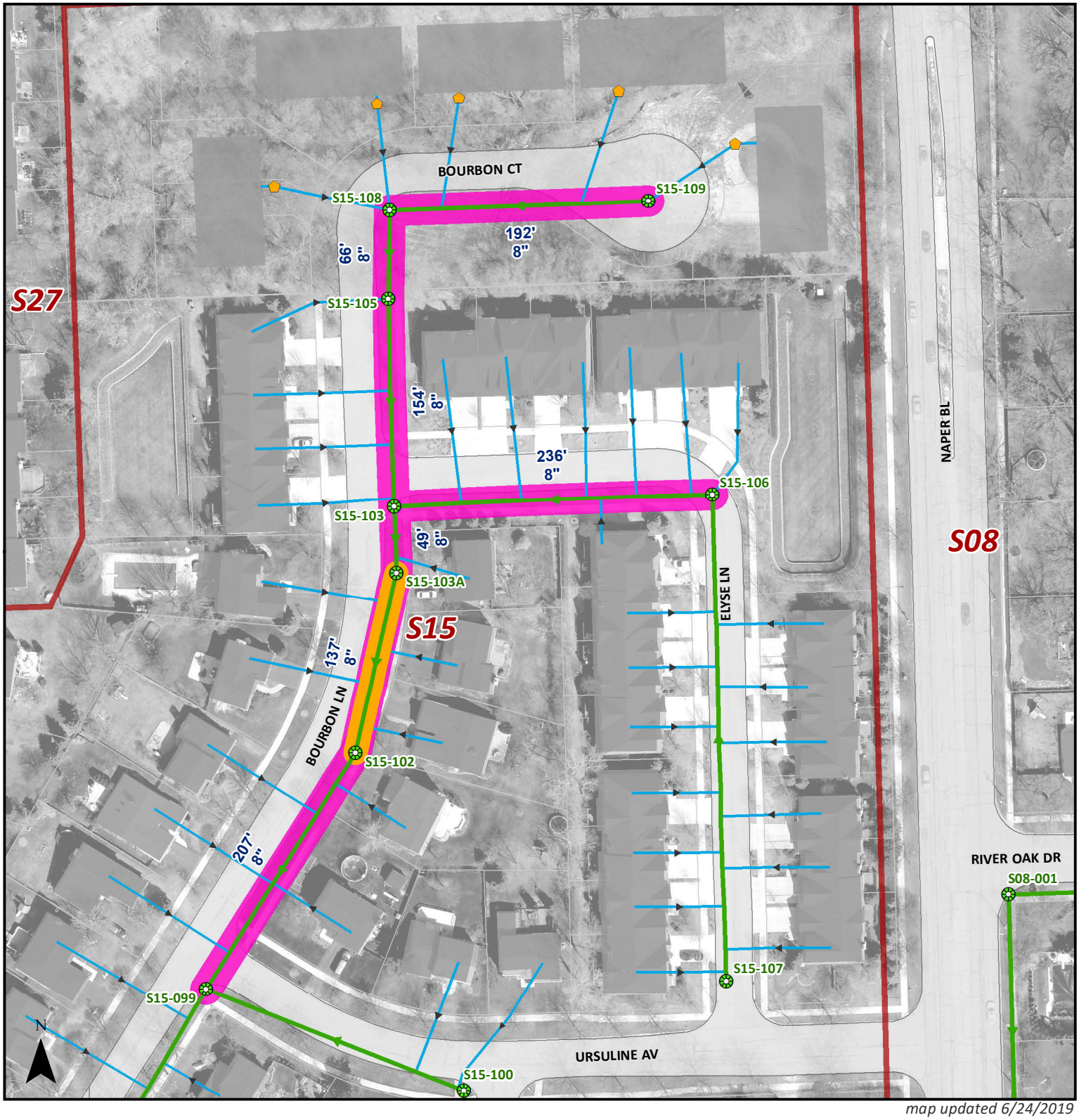
PMS CHECK: FM-20 **Location: Burbon Ct/Elyse Ln**

Sets: S15-106>103 S15-109>108 S15-108>105 S15-105>103
S15-103>103A S15-103A>102 S15-102>099

Description and Procedures

Flush 7 sets - Lines are flat and Low Flow.

S15-103A>S15-102 **(Low Pressure)**



map updated 6/24/2019

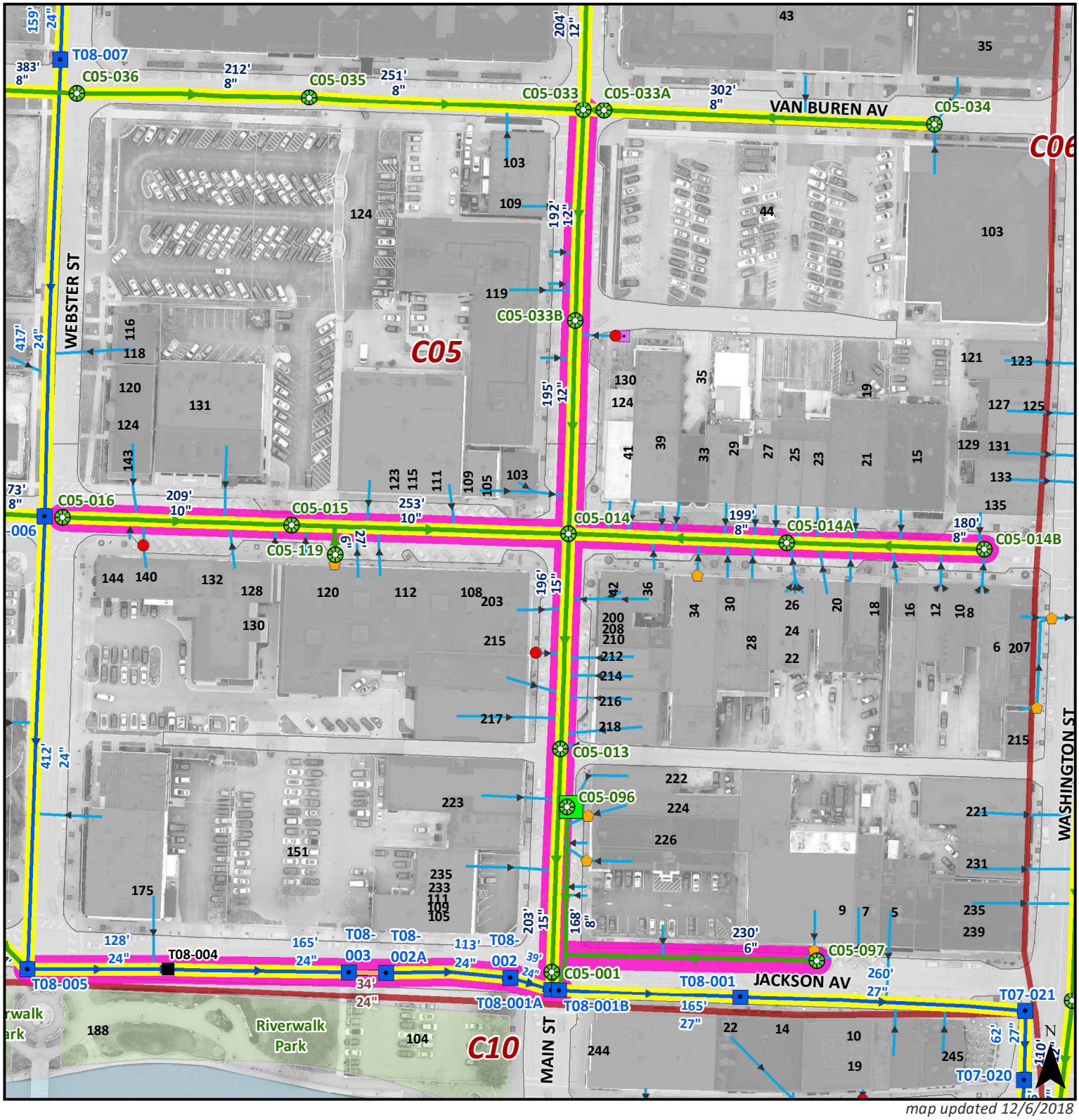
SANITARY FLUSHING PMS

PMS CHECK: FQ-1 **Location: Jefferson, Main, Jackson**

Sets: See Map Below

Description and Procedures

Flush C05-097 (Jackson Av in front of Pottery Barn) **Early AM Only**. Set up at C05-097, 6" Main. Reverse flush with forward jet nozzle only. **No Proofer**. Vac out everything while flushing, main connects with "T" at main (no manhole)



map updated 12/6/2018

SANITARY FLUSHING PMS

PMS CHECK: FQ-3 **Location: Hobson Mill Drive**

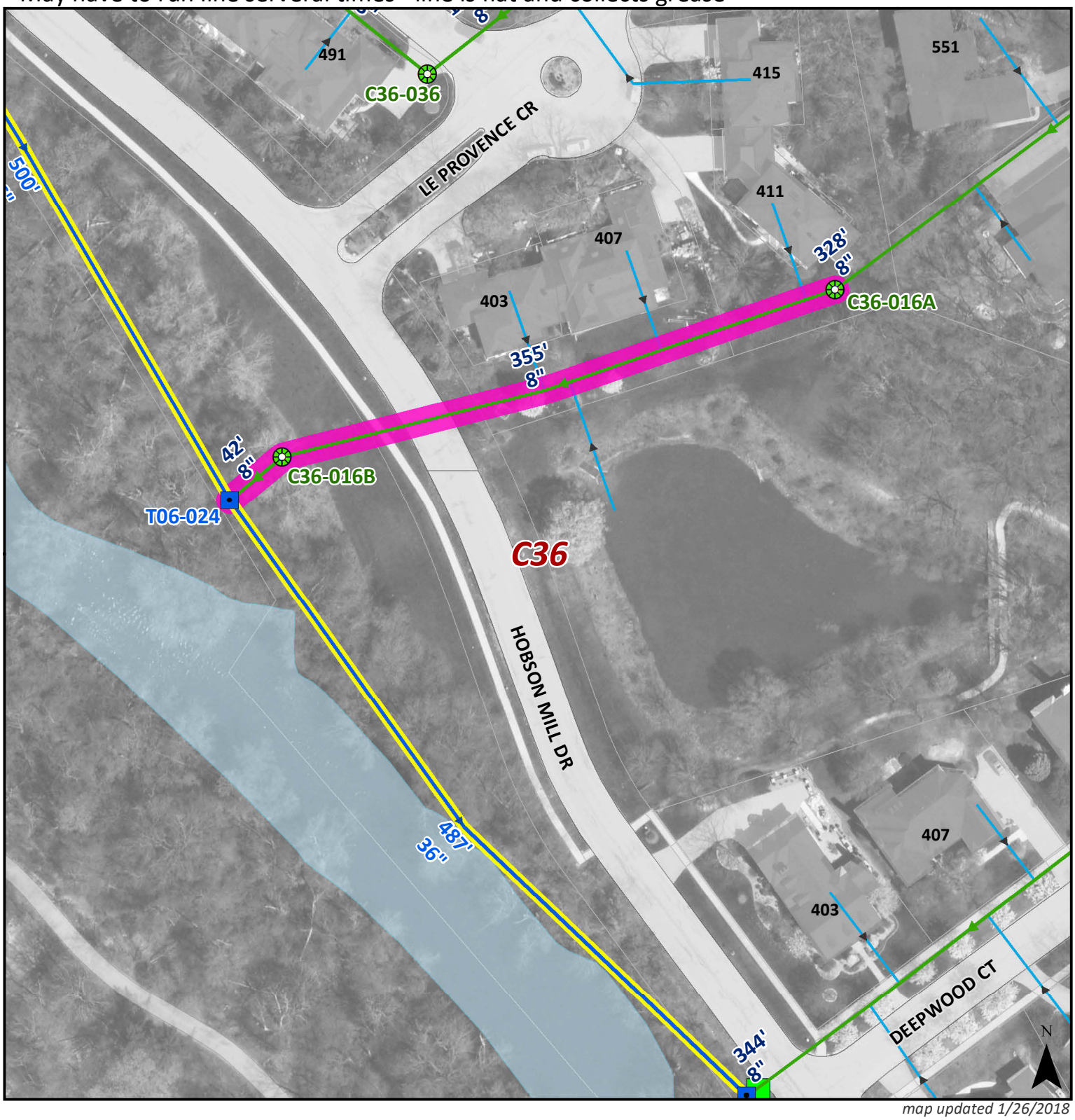
Sets: C36-016A>C36-016B C36-016B>T06-024

Description and Procedures

Flush 1 set from the interceptor to the 1st manhole east of the interceptor. Set up line and pull hose to T06-024 and flush past C36-016B east to C36-016A

Do this line when ground is solid

May have to run line serveral times - line is flat and collects grease



map updated 1/26/2018

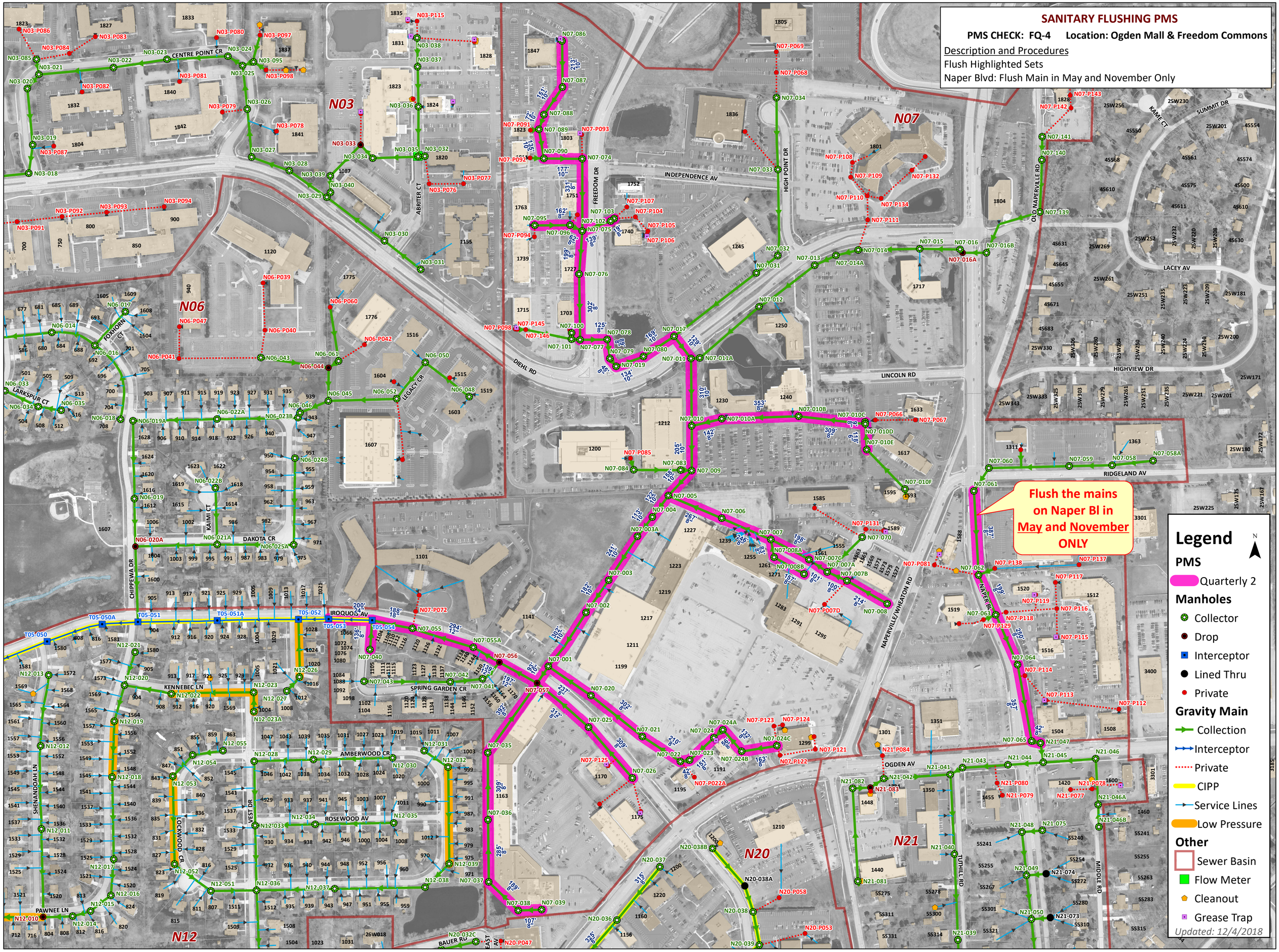
SANITARY FLUSHING PMS

PMS CHECK: FQ-4 Location: Ogden Mall & Freedom Commons

Description and Procedures

Flush Highlighted Sets

Naper Blvd: Flush Main in May and November Only



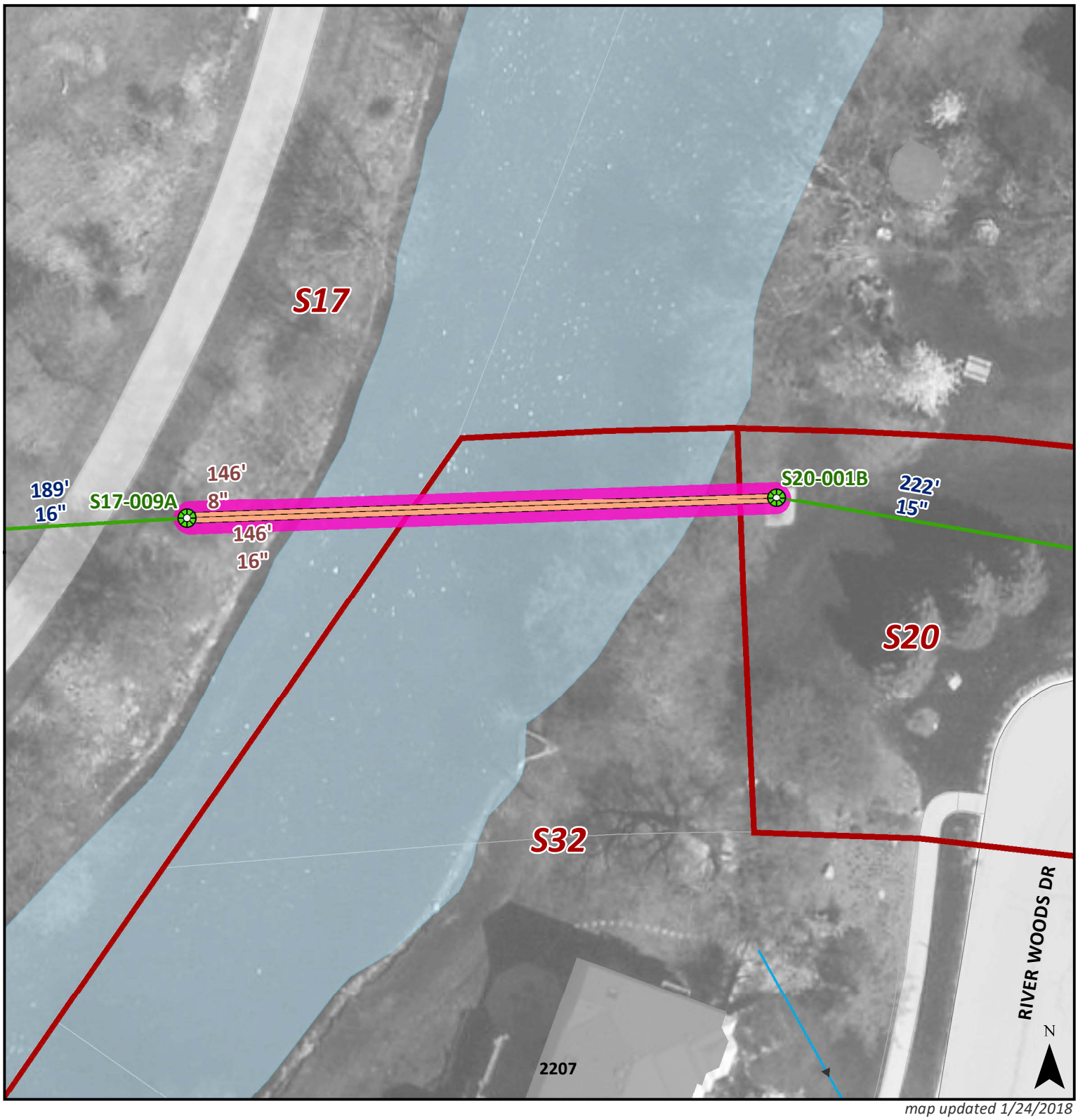
SANITARY FLUSHING PMS

PMS CHECK: FQ-5 **Location: 87th St Siphon**

Sets: S17-009A>S20-001B

Description and Procedures

Flush S20-001B to S17-009A - 2 barrels @ 145 ft each



map updated 1/24/2018

SANITARY FLUSHING PMS

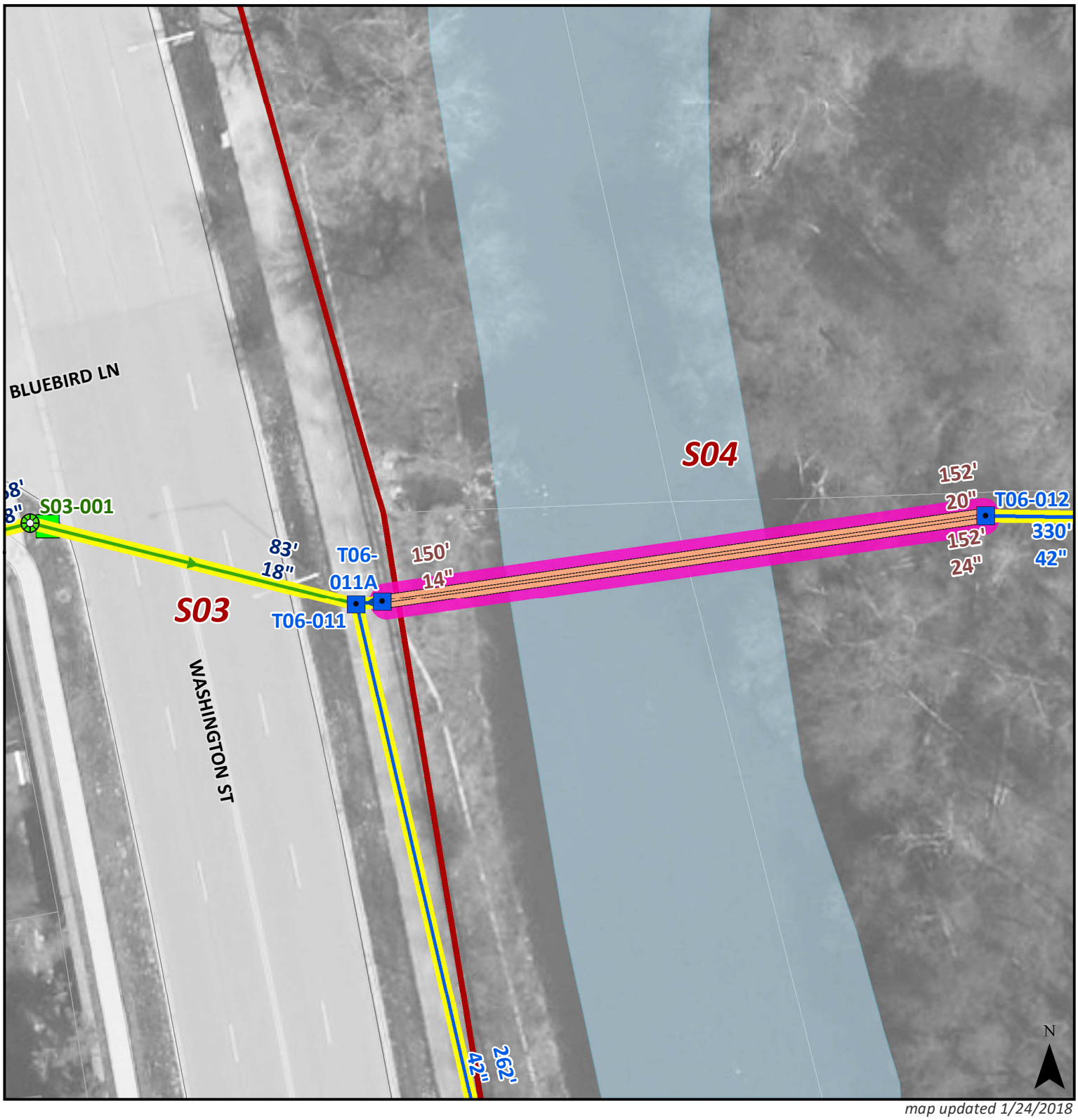
PMS CHECK: FQ-5 **Location: Bluebird Siphon**

Sets: T06-011>T06-011A T06-011A>T06-012

Description and Procedures

REMEMBER TO TAKE BIKE PATH SIGNAGE

Flush T06-12 to T06-011 - 3 barrels @ 156 ft each



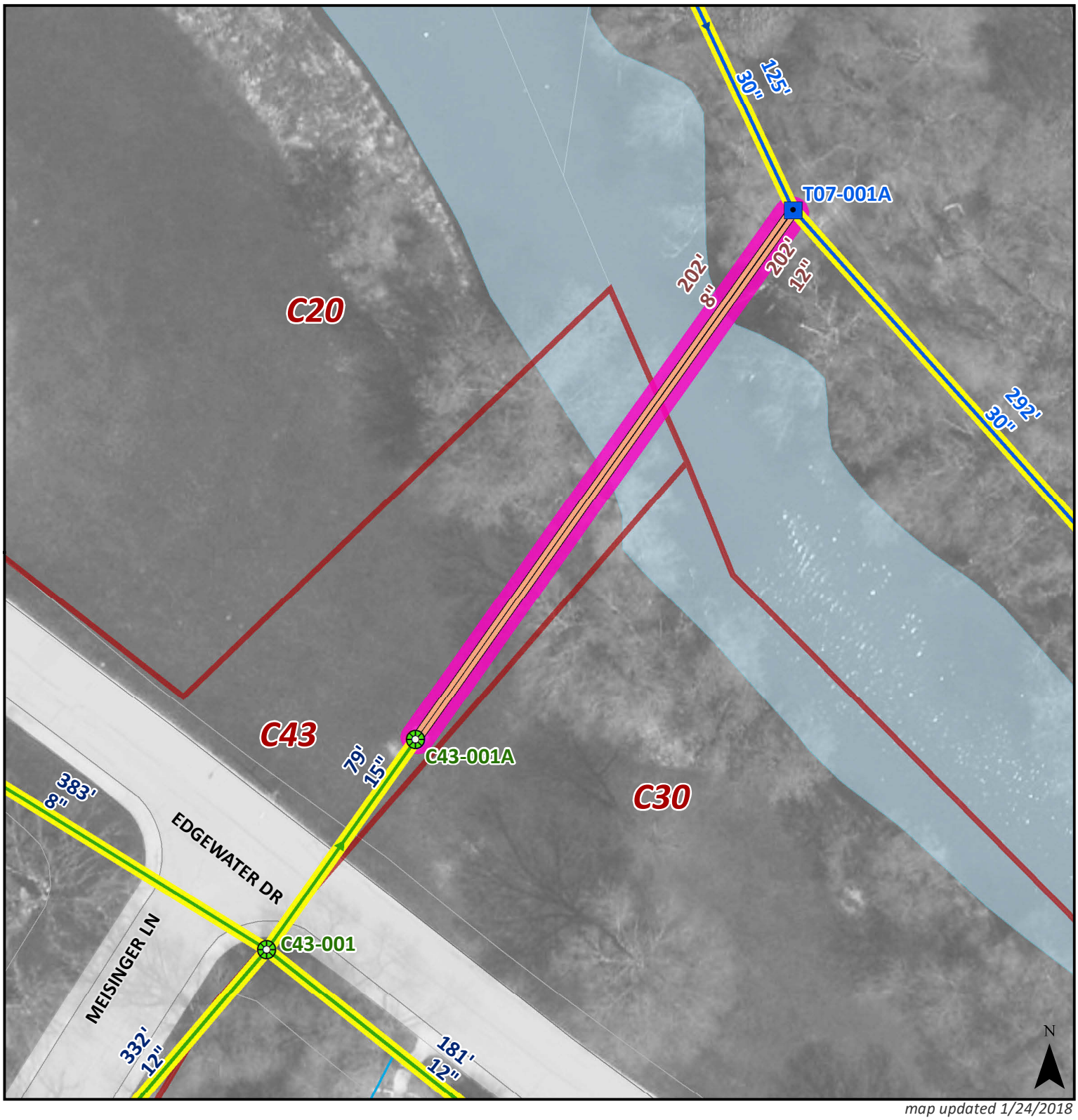
map updated 1/24/2018

SANITARY FLUSHING PMS

PMS CHECK: FQ-5 **Location: Edgewater Siphon**

Sets: C43-001A>T07-001A

Description and Procedures
2 barrels @ 205ft each
Flush effluent pipe to interceptor



map updated 1/24/2018

SANITARY FLUSHING PMS

PMS CHECK: FQ-5 **Location: Gartner Siphon**

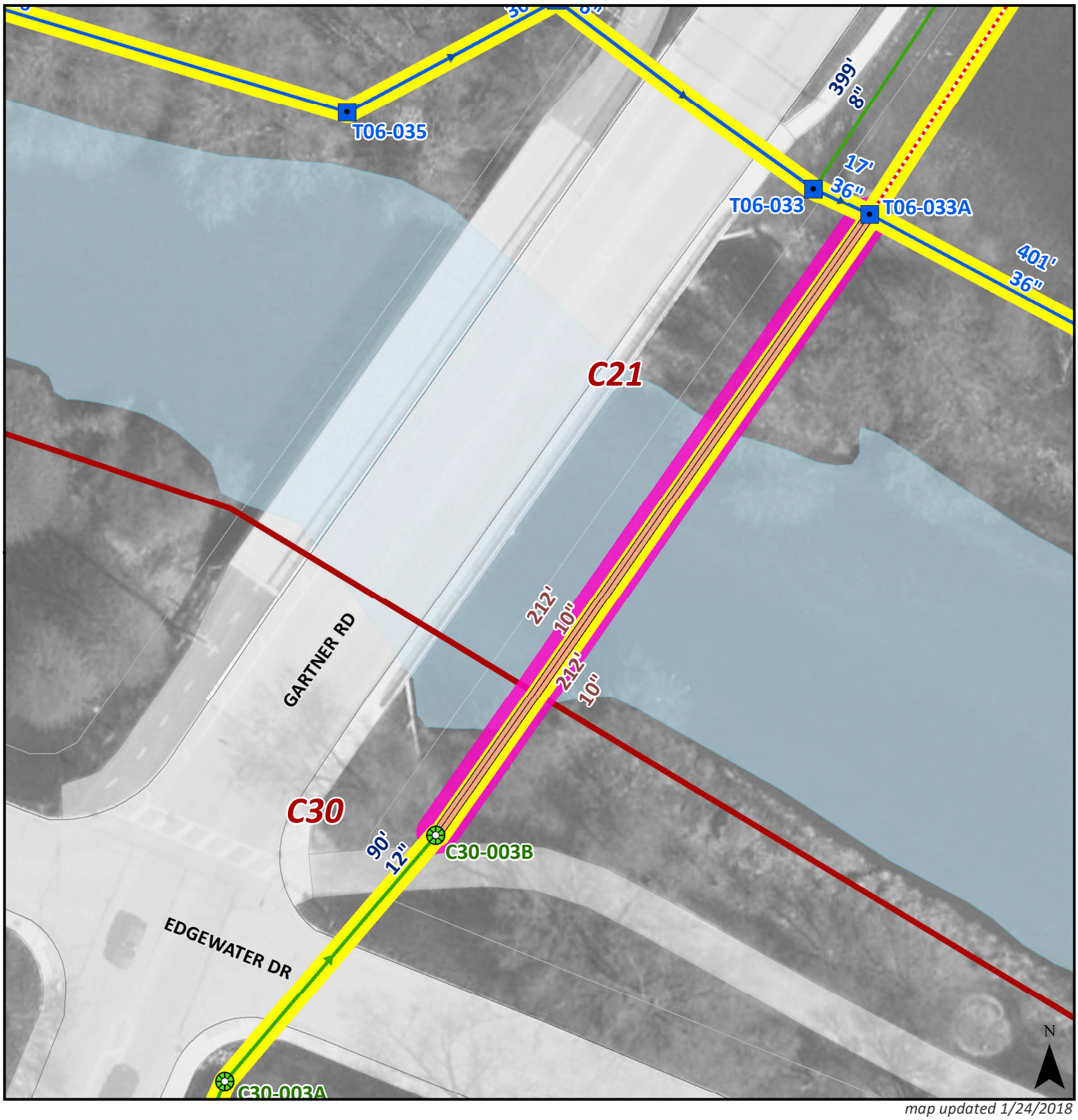
Sets: C30-003B>T06-033A

Description and Procedures

REMEMBER TO TAKE BIKE PATH SIGNAGE

2 Barrels (lined) @ 211ft each

Flush to Interceptor



map updated 1/24/2018

SANITARY FLUSHING PMS

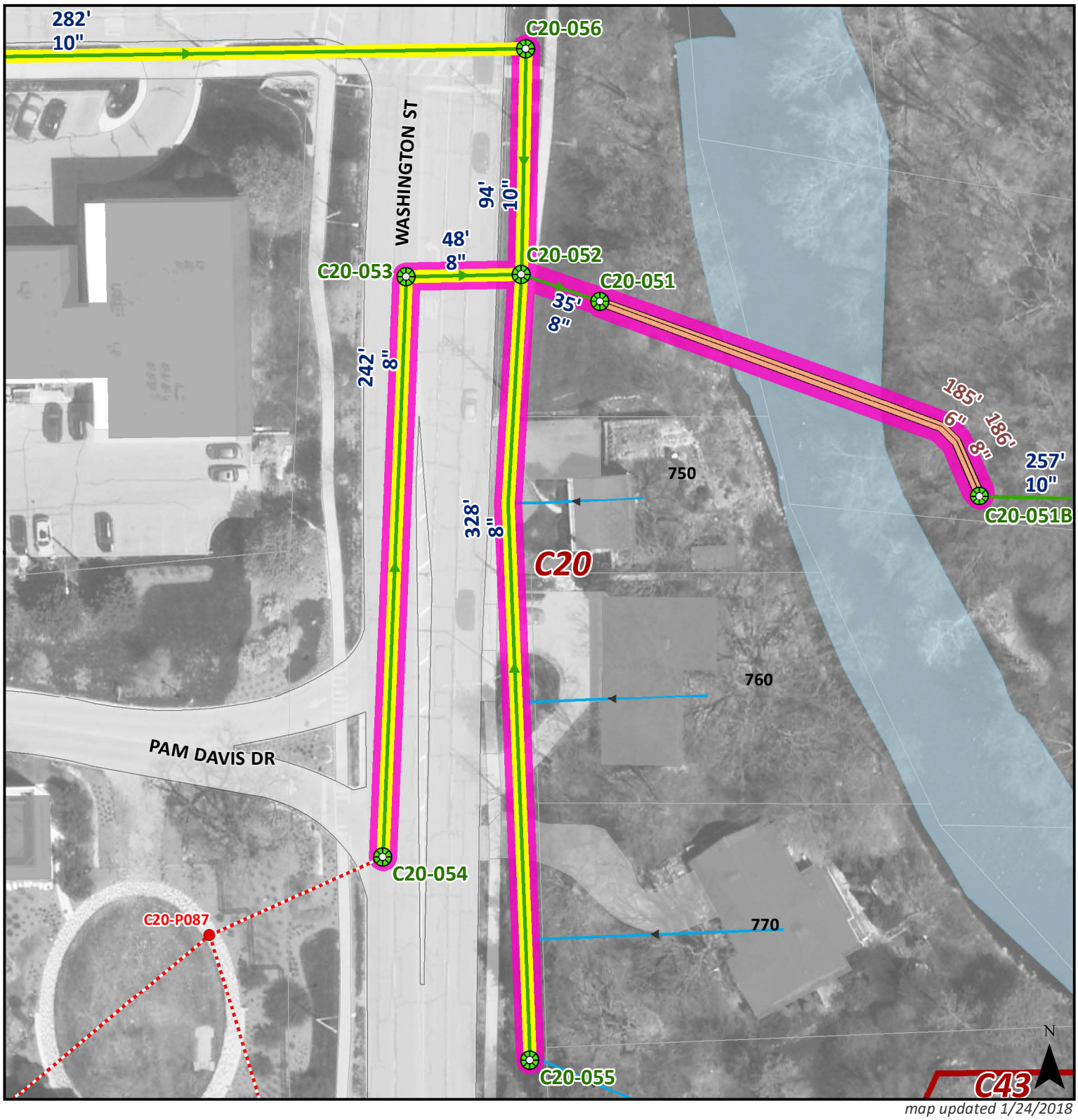
PMS CHECK: FQ-5 **Location: Hospital Siphon**

Sets: C20-054>C20-053 C20-053>C20-052 C20-56>C20-052 C20-055>C20-052
C20-052>C20-051 C20-051>C20-051B

Description and Procedures

Siphon - 2 barrels @ 178' each

Flush sets on both sides of Washington. Bucket/remove grit from C20-051B (MH on east side of river)



map updated 1/24/2018

SANITARY FLUSHING PMS

PMS CHECK: FQ-5 **Location: I-88 Tollway Siphon**

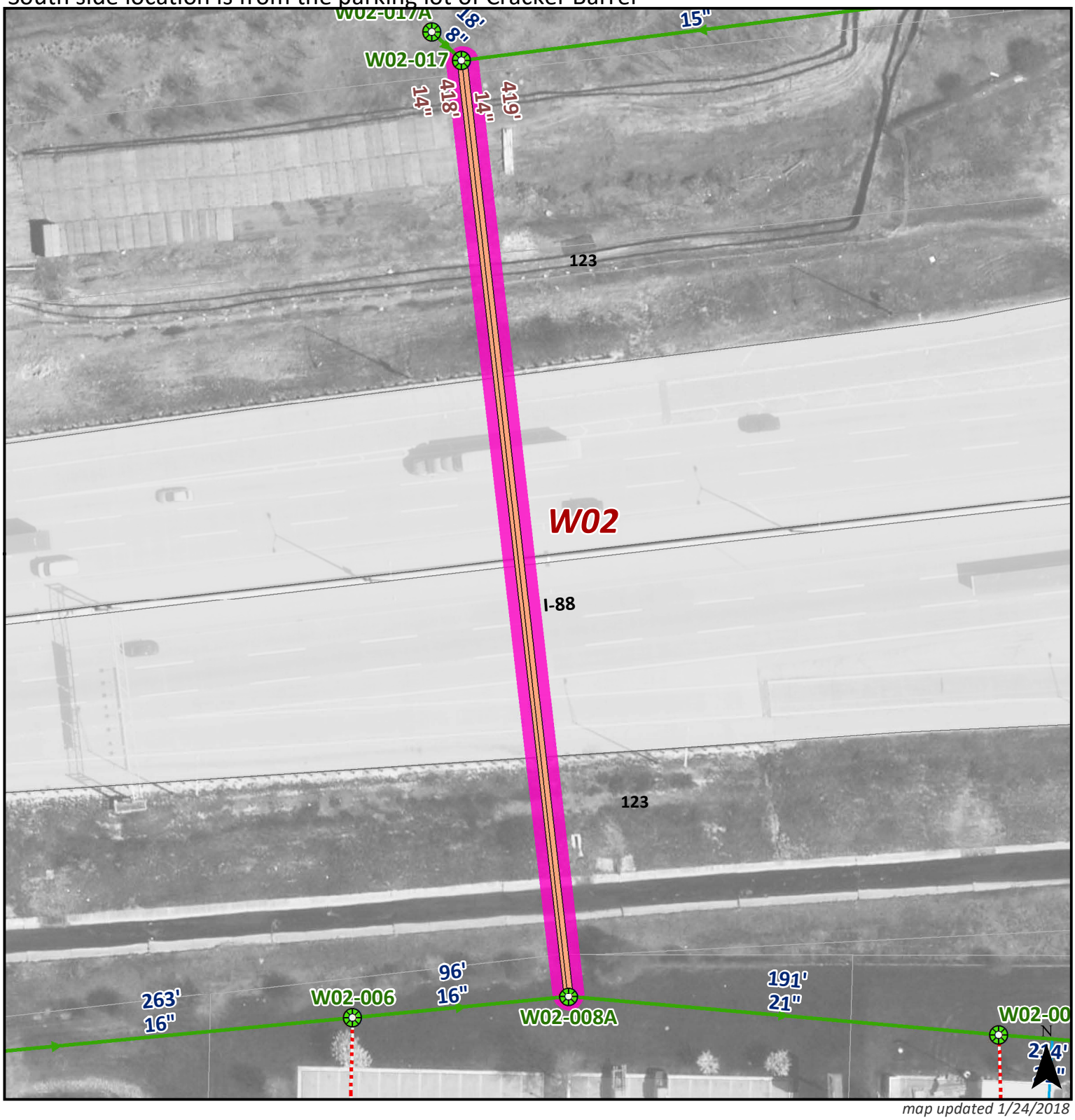
Sets: W02-017>W02-008A

<u>Description and Procedures</u>

2 Barrels

North side location is off the access road by Carmax

South side location is from the parking lot of Cracker Barrel



map updated 1/24/2018

SANITARY FLUSHING PMS

PMS CHECK: FQ-6 **Location: Springdale, Windemere, Gateshead**

Description and Procedures

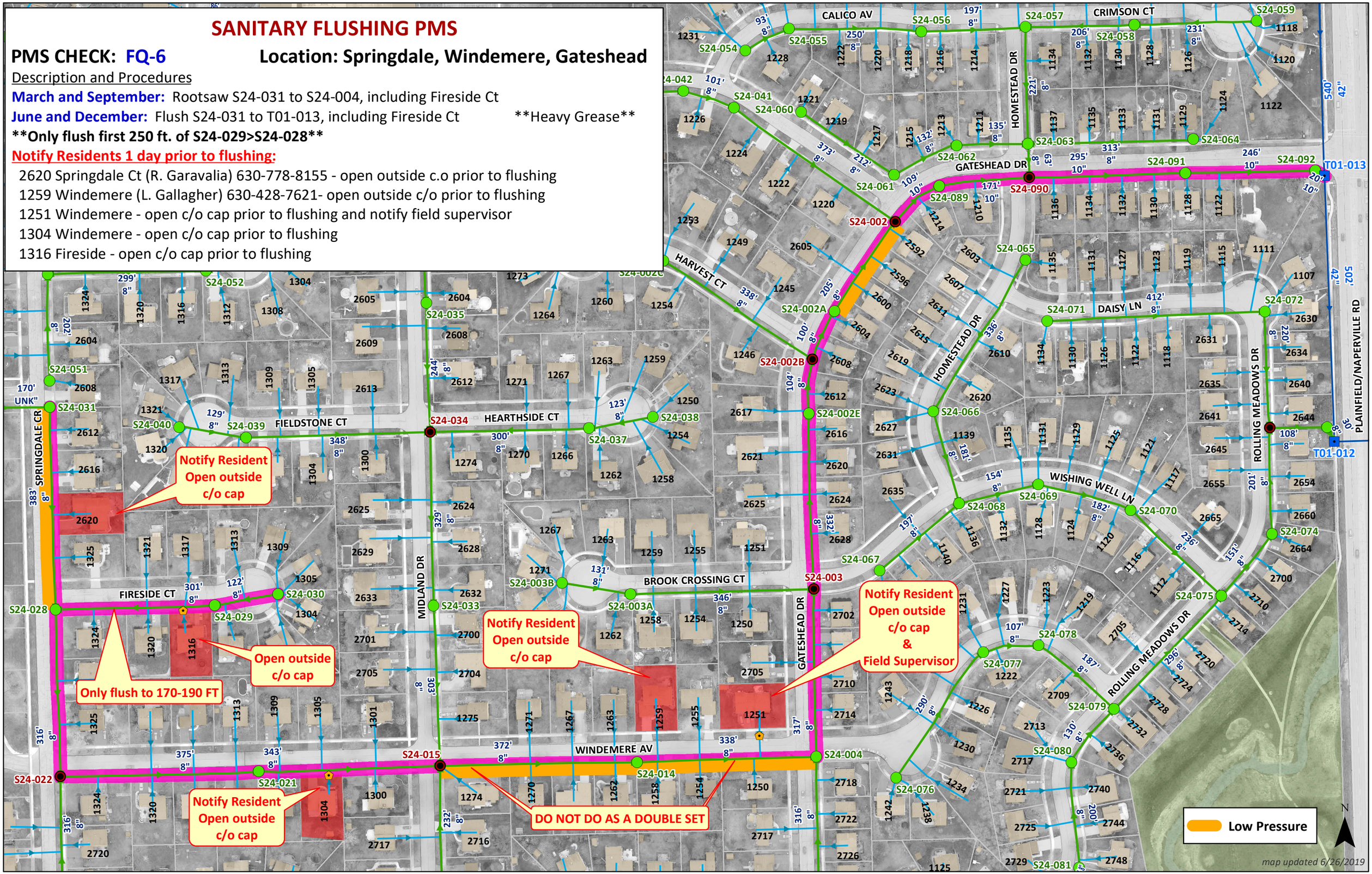
March and September: Rootsaw S24-031 to S24-004, including Fireside Ct

June and December: Flush S24-031 to T01-013, including Fireside Ct **Heavy Grease**

****Only flush first 250 ft. of S24-029>S24-028****

Notify Residents 1 day prior to flushing:

2620 Springdale Ct (R. Garavalia) 630-778-8155 - open outside c.o prior to flushing
1259 Windemere (L. Gallagher) 630-428-7621- open outside c/o prior to flushing
1251 Windemere - open c/o cap prior to flushing and notify field supervisor
1304 Windemere - open c/o cap prior to flushing
1316 Fireside - open c/o cap prior to flushing



SANITARY FLUSHING PMS

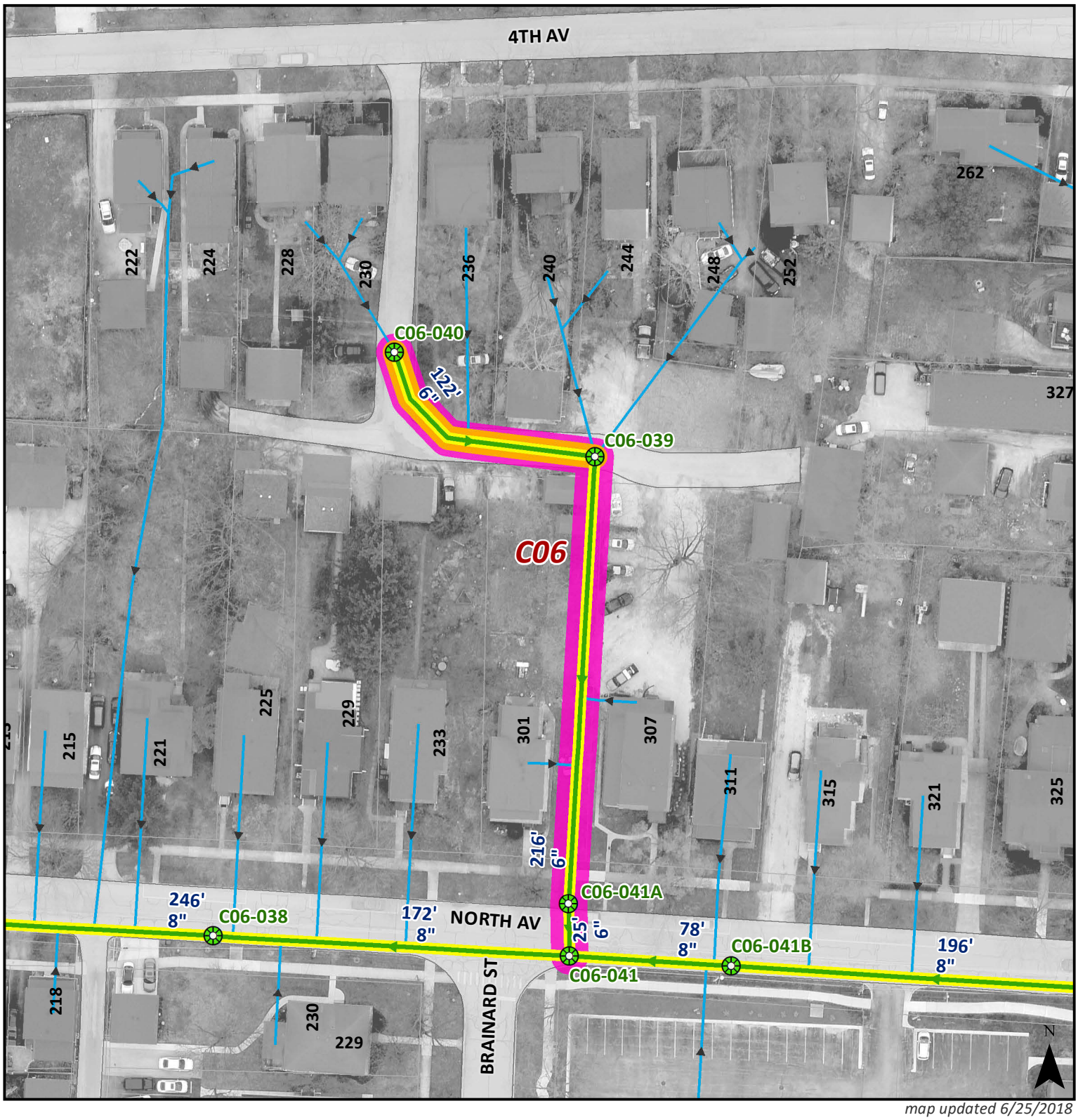
PMS CHECK: FQ-7 **Location: 4th Av Alley to North Av**

Sets: C06-040>C06-039 C06-039>C06-041A C6-041A>C06-041

Description and Procedures

C06-040>C06-039 **(Low Pressure)**

Use small nozzle wit no forward jet and no proofer



map updated 6/25/2018

SANITARY FLUSHING PMS

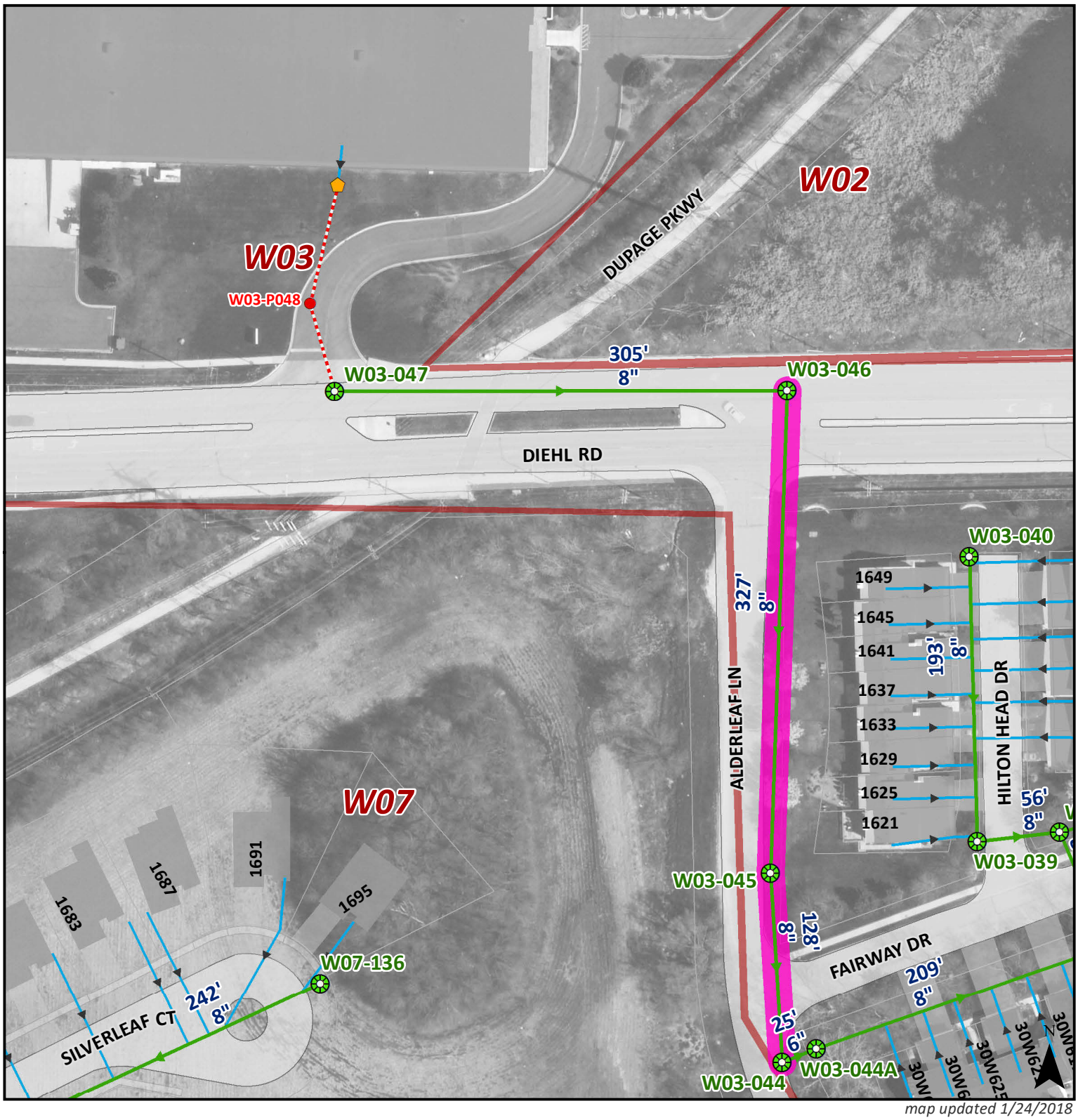
PMS CHECK: FQ-9

Location: Factory Card Outlet (Diehl/Fairway)

Sets: W03-046>W03-045 W03-045>W03-044

<u>Description and Procedures</u>

Flush 2 sets - line is flat



map updated 1/24/2018

SANITARY FLUSHING PMS

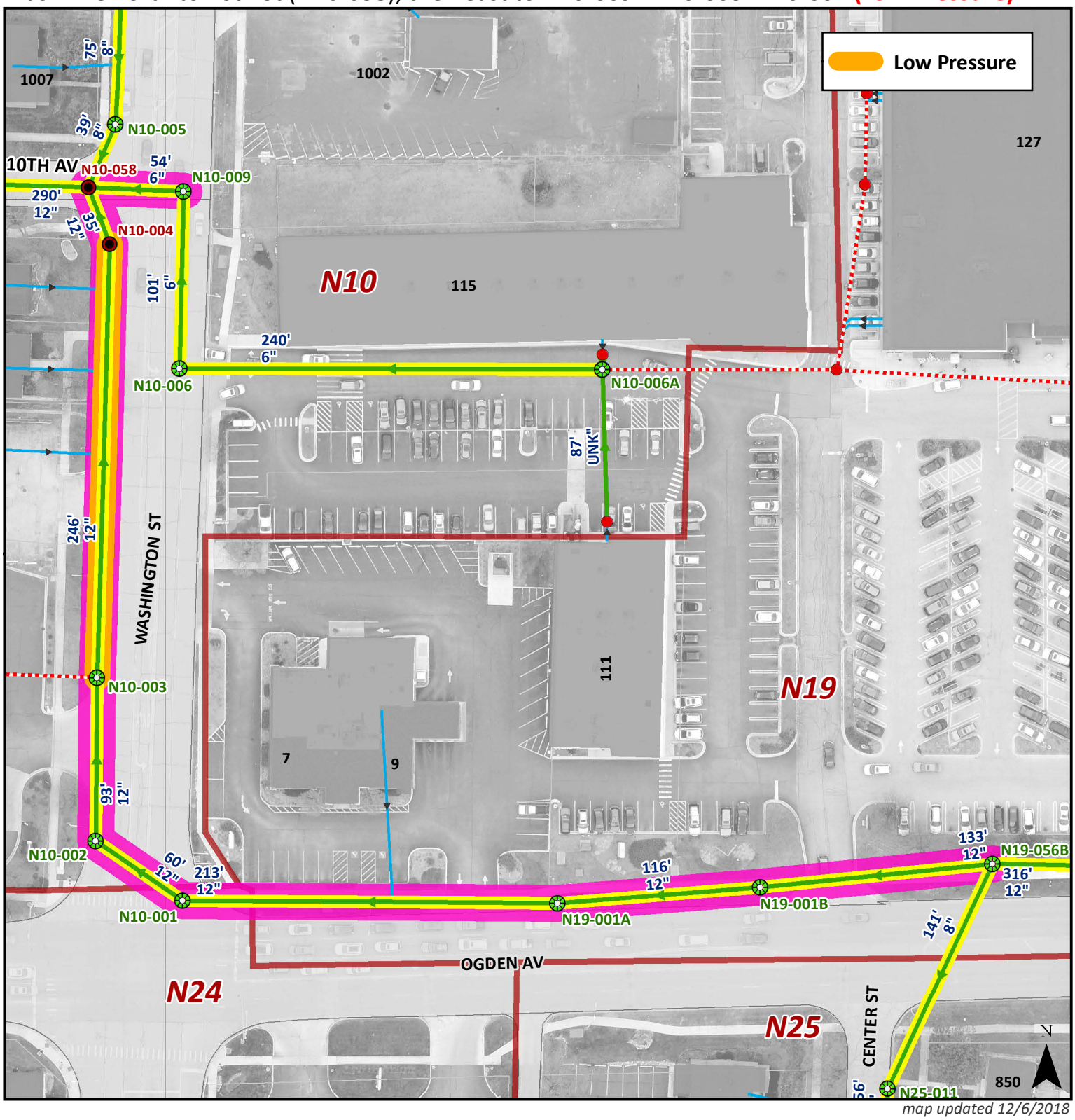
PMS CHECK: FQ-11 **Location: Ogden/Washington**

Sets: N19-056B>N19-001B N19-001B>N19-001A N19-001A>N10-001 N10-001>N10-002
N10-002>N10-003 N10-003>N10-004 N10-004>N10-058 N10-009>N10-058

Description and Procedures

****LOW TRAFFIC HOURS****

Set up in the southbound lan of Washington at the NW corner of Ogden/Washington - Use Cones
Flush east N19-056B. **Main bellies under storm on Washington**
Flush line north to 10th St (N10-058), then east to N10-009. N10-003>N10-004 **(Low Pressure)**



map updated 12/6/2018

SANITARY FLUSHING PMS

PMS CHECK: FQ-13 **Location: Allister**

Sets: W06-063A>W06-062

Description and Procedures

Grease Accumulation - Can reverse flush - no services attached

South sie of yard is 30W313 Allister

map updated 1/24/2018

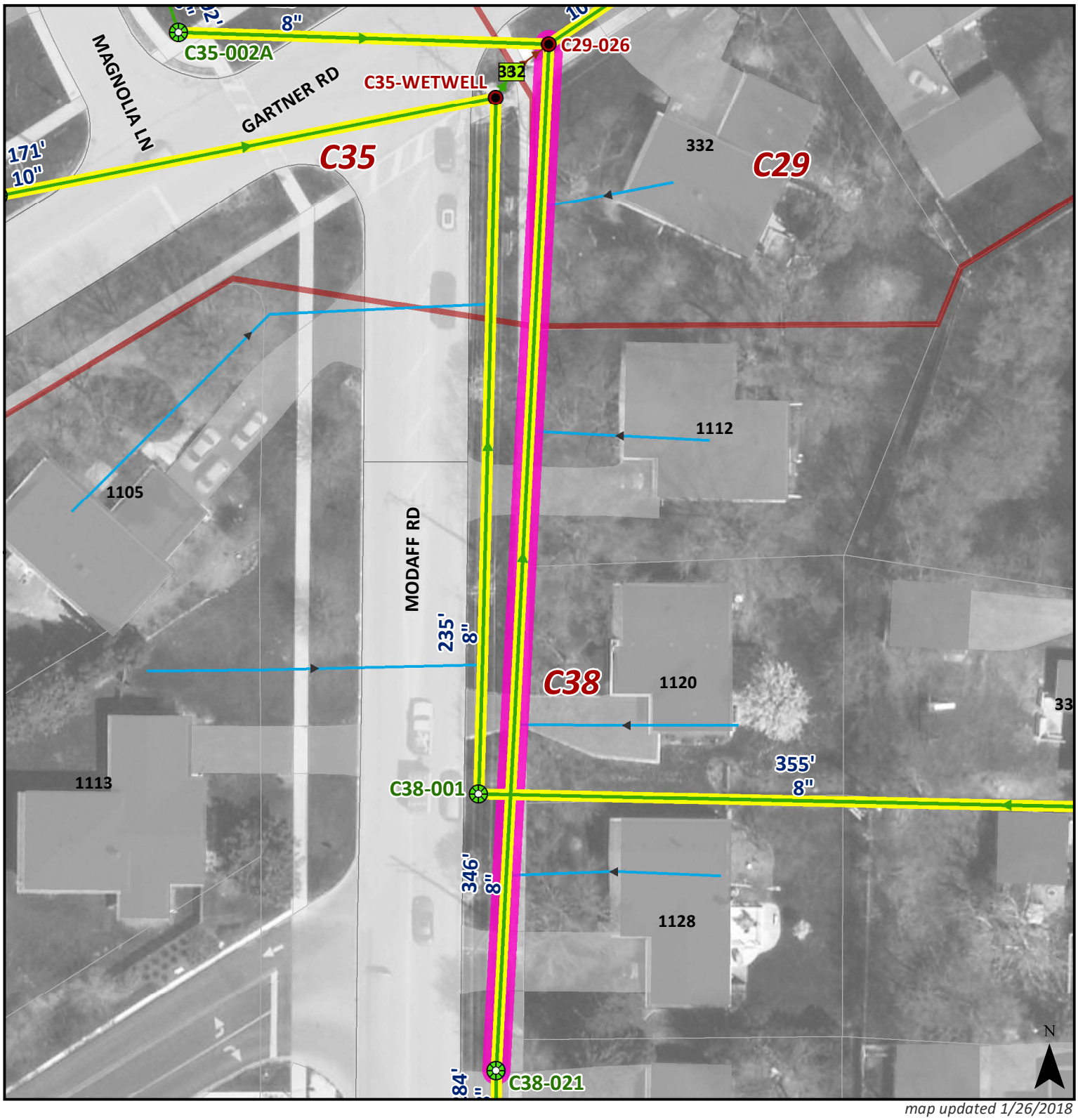
SANITARY FLUSHING PMS

PMS CHECK: FQ-14 **Location: Modaff & Gartner**

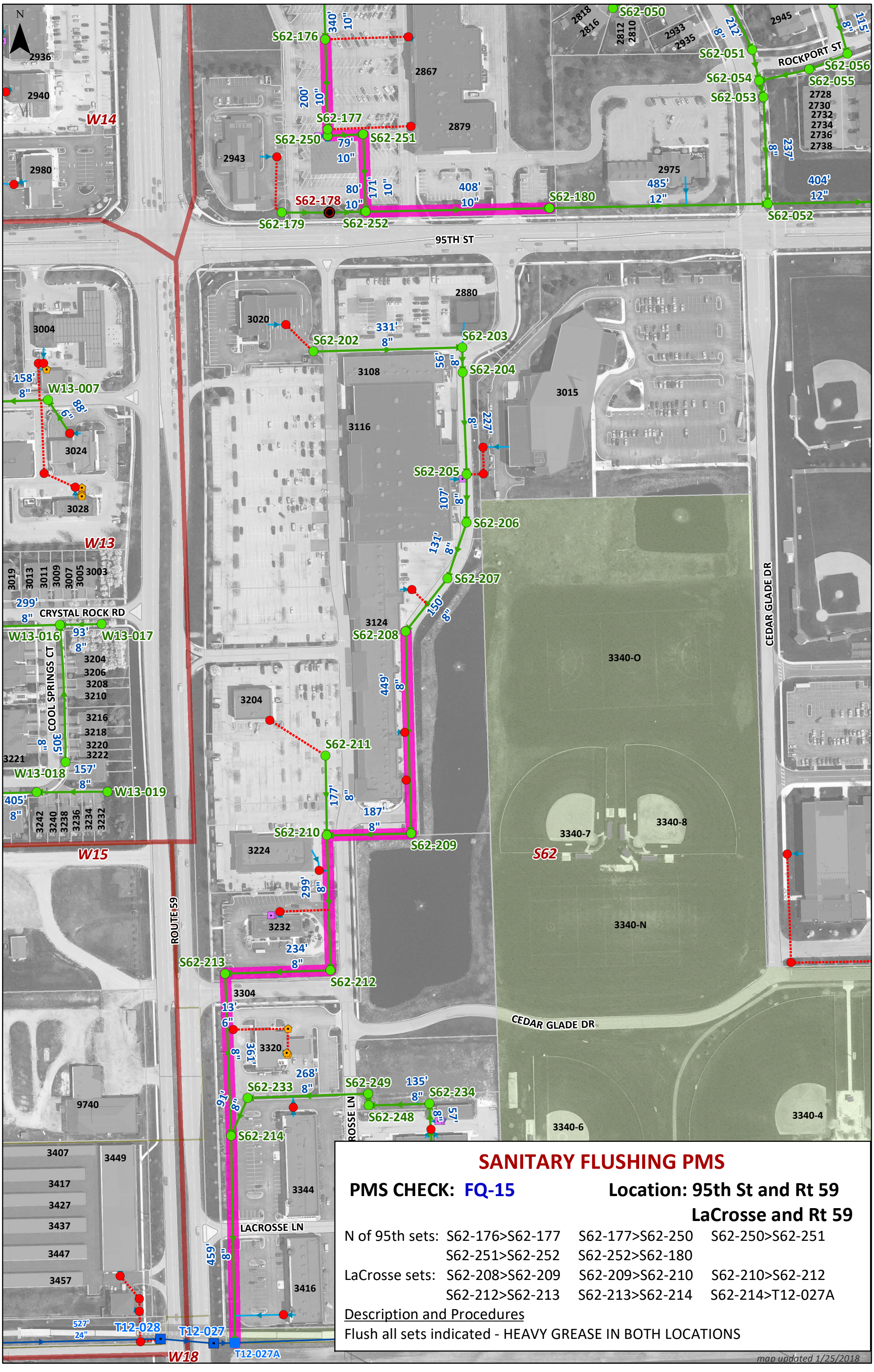
Sets: C38-021>C29-026

Description and Procedures

Grease accumulation - Flush using grease nozzle



map updated 1/26/2018



SANITARY FLUSHING PMS

PMS CHECK: FQ-15 **Location: 95th St and Rt 59**

LaCrosse and Rt 59

N of 95th sets: S62-176>S62-177 S62-177>S62-250 S62-250>S62-251
S62-251>S62-252 S62-252>S62-180

LaCrosse sets: S62-208>S62-209 S62-209>S62-210 S62-210>S62-212
S62-212>S62-213 S62-213>S62-214 S62-214>T12-027A

Description and Procedures

Flush all sets indicated - HEAVY GREASE IN BOTH LOCATIONS

SANITARY FLUSHING PMS

PMS CHECK: FQ-16 **Location: Idlewild (Carillon Club)**

Sets: W25-024>W25-023 W25-023>W22 W25-022>W25-021 W25-025>W25-026
W25-026>W25-008

Description and Procedures

Flush Sets

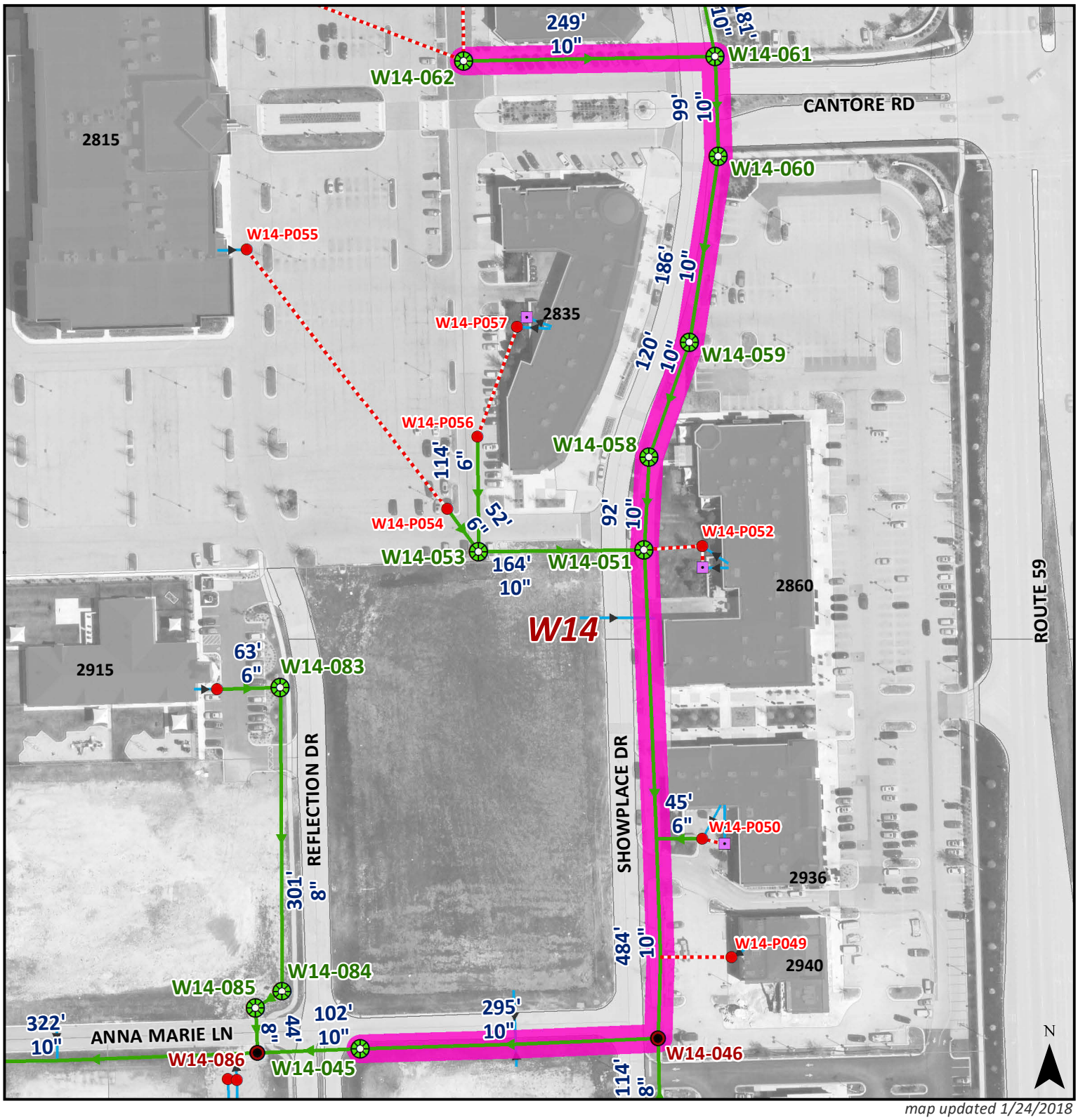
W25-026>W25-008 **(Low Pressure)**

map updated 6/25/2018

SANITARY FLUSHING PMS

PMS CHECK: FQ-17 **Location: Showplace**

Sets: W14-062>W14-061 W14-061>W14-060 W14-060>W14-059 W14-059>W14-058
W14-058>W14-051 W14-051>W14-046 W14-046>W14-045



map updated 1/24/2018

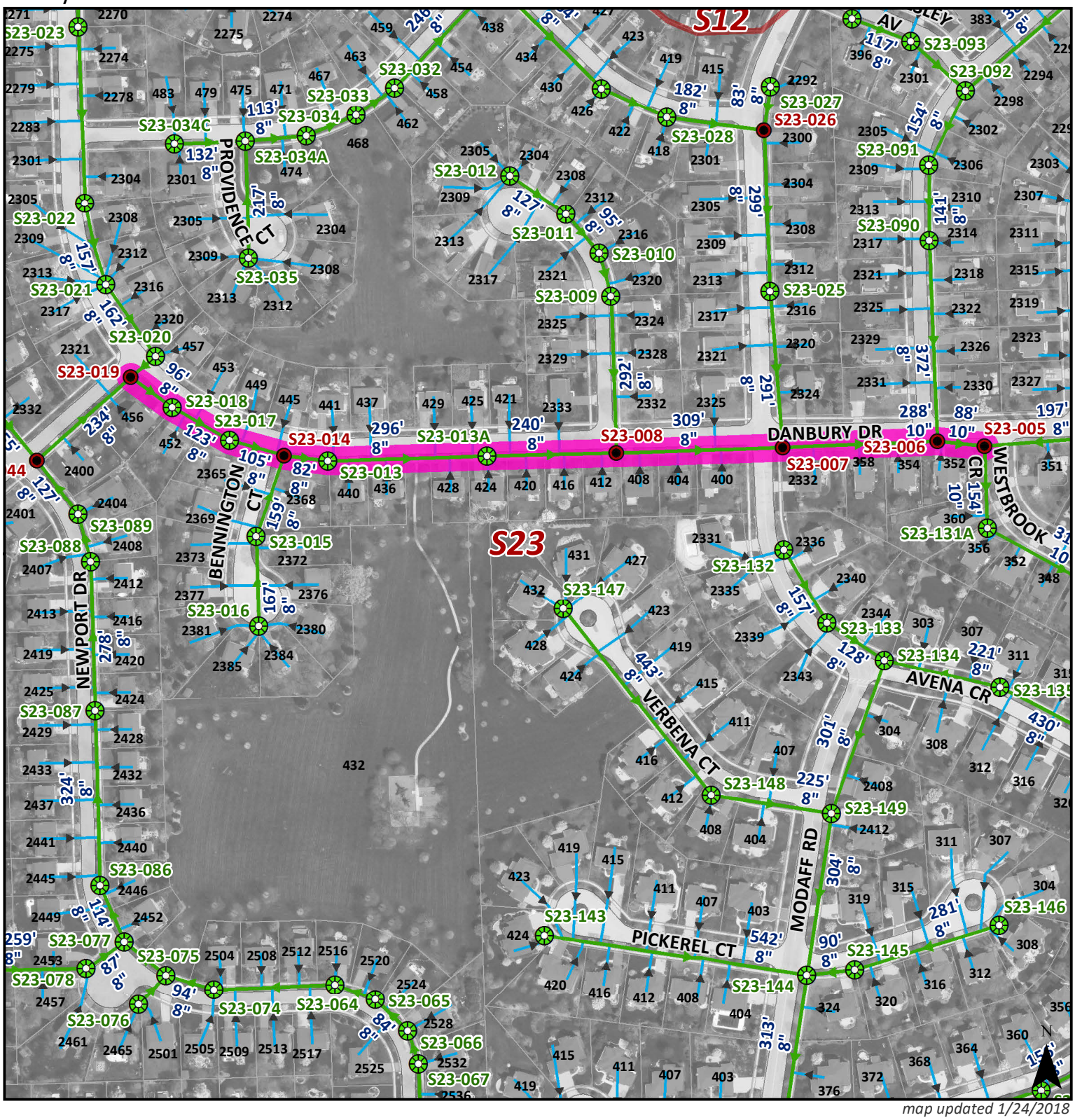
SANITARY FLUSHING PMS

PMS CHECK: FQ-18 **Location: Massachusets - Brock to Westbrook**

Sets: S23-019>S23-018 S23-018>S23-017 S23-017>S23-014 S23-014>S23-013
S23-013>S23-013A S23-013A>S23-008 S23-008-S23-007 S23-007>S23-006
S23-006>S23-005

Description and Procedures

Heavy Grease



map updated 1/24/2018

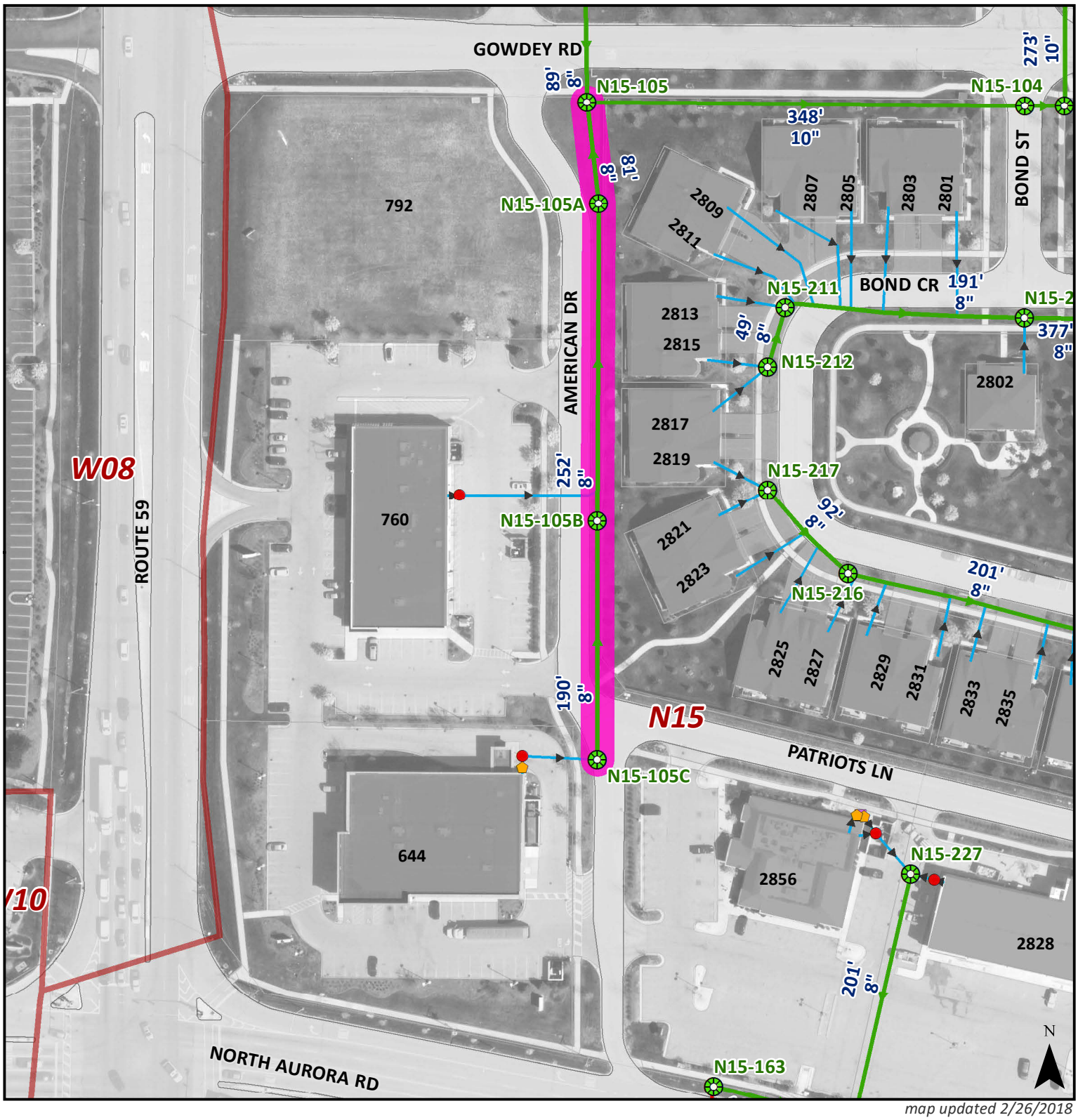
SANITARY FLUSHING PMS

PMS CHECK: FQ-19 **Location: American Drive**

Sets: N15-105C>N15-105B>N15-105A>N15-105

<u>Description and Procedures</u>

Flush 3 sets - Grease found, holding water



map updated 2/26/2018

SANITARY FLUSHING PMS

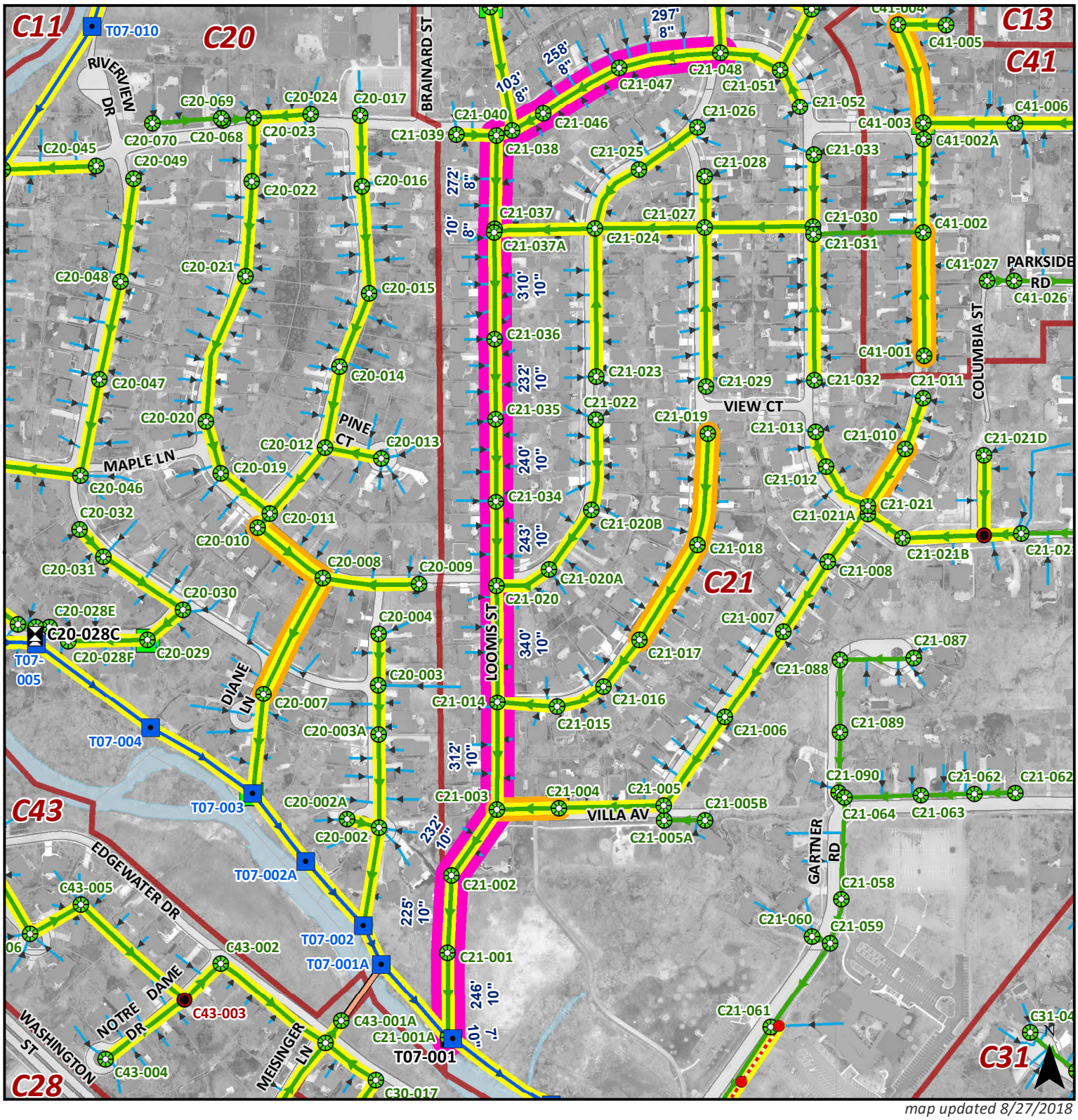
PMS CHECK: FQ-20 **Location: South Loomis**

Sets: C21-048>C21-047
C21-047>C21-046
C21-046>C21-040
C21-040>C21-038
C21-038>C21-037

C21-037>C21-037A
C21-037A>C21-036
C21-036>C21-035
C21-035>C21-034
C21-034>C21-020

C21-020>C21-014
C21-014>C21-003
C21-003>C21-002
C21-002>C21-001
C21-001>C21-001A

C21-001A>T07-001

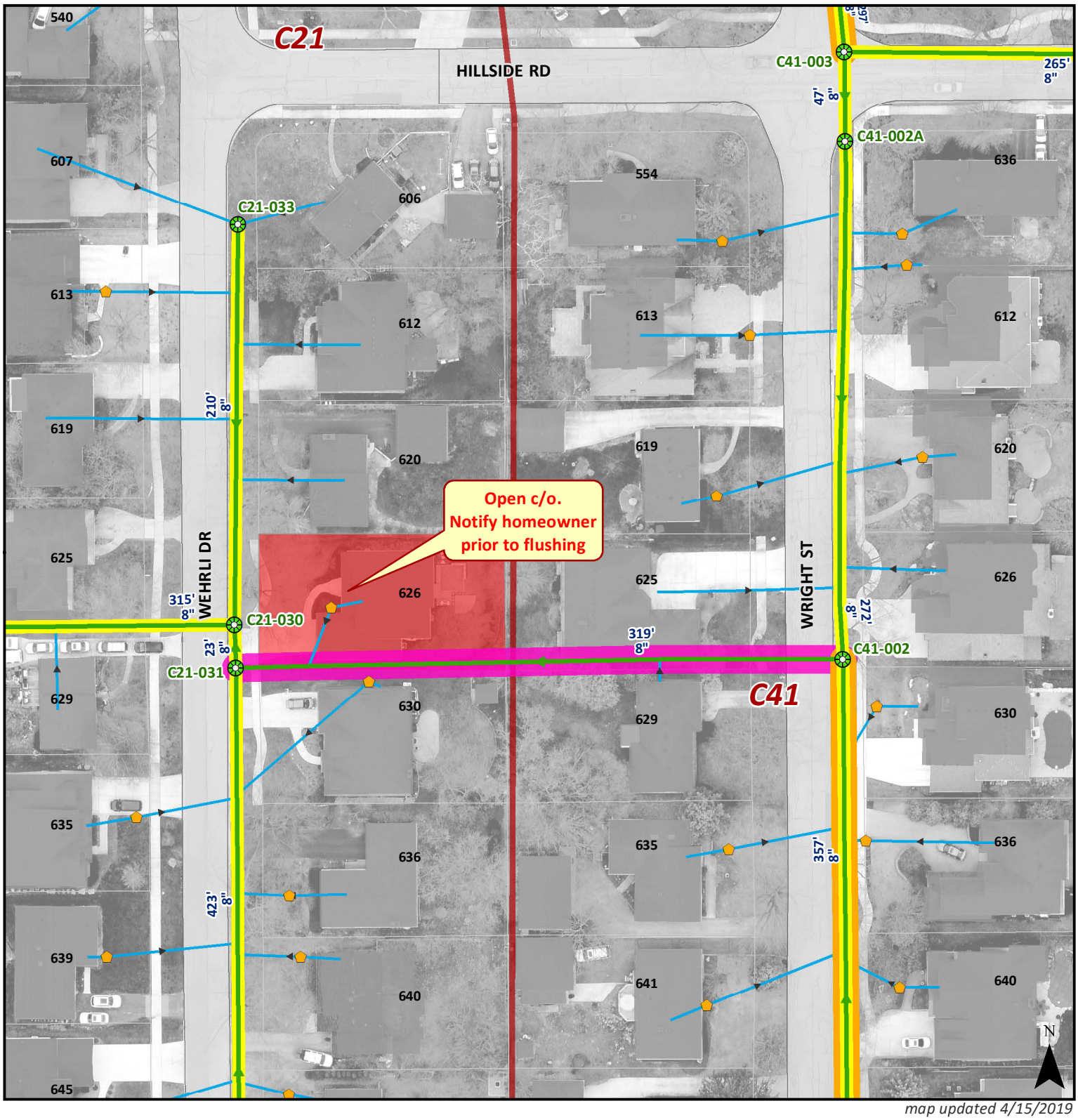


map updated 8/27/2018

SANITARY FLUSHING PMS

PMS CHECK: FQ-21 **Location: Wehrli/Wright**

Sets: C41-002>C21-031



map updated 4/15/2019

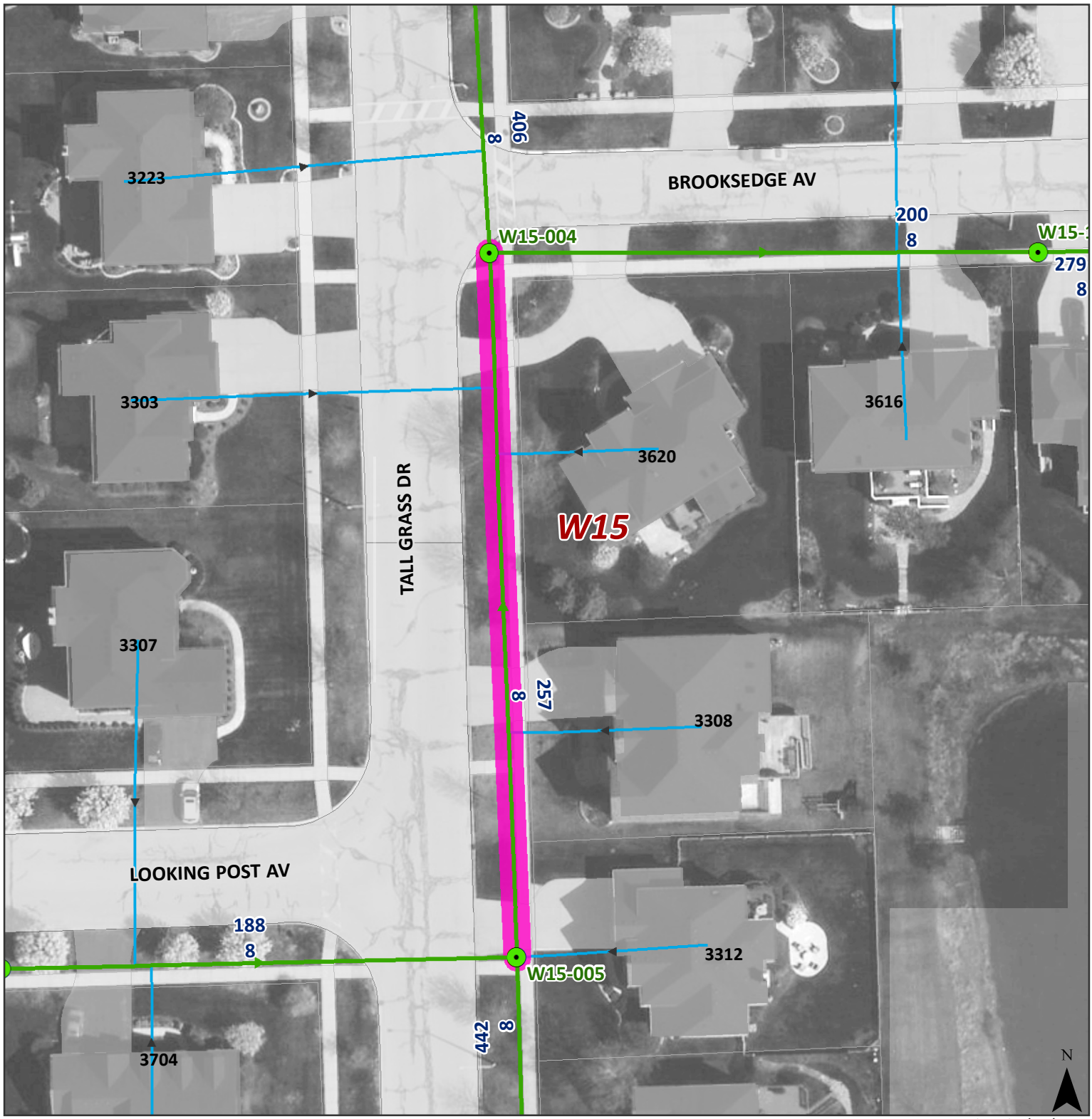
SANITARY FLUSHING PMS

PMS CHECK: FQ-22 **Location: Tall Grass Dr**

Set: W15-005>W15-004

<u>Description and Procedures</u>

Heavy Grease



map updated 5/26/2017

SANITARY FLUSHING PMS

PMS CHECK: FS-1 **Location: Highland to Chicago**

C13-023A>C06-087>086>085>084>083>082>081>069

Description and Procedures

Set up on the 1st MH of Wright on Highland (C13-023A)

Flush Highland to Chicago Av

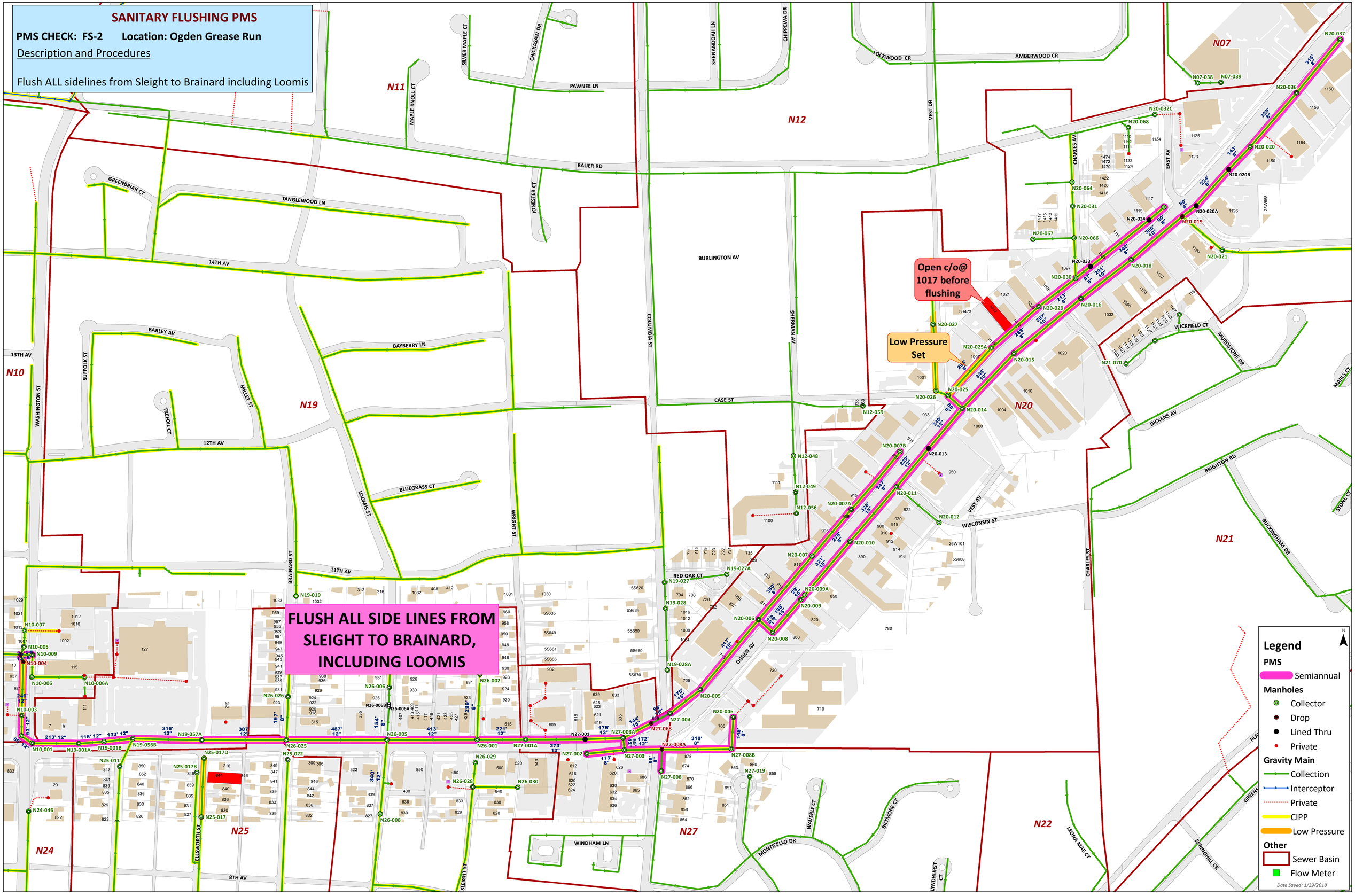
map updated 2/13/2018

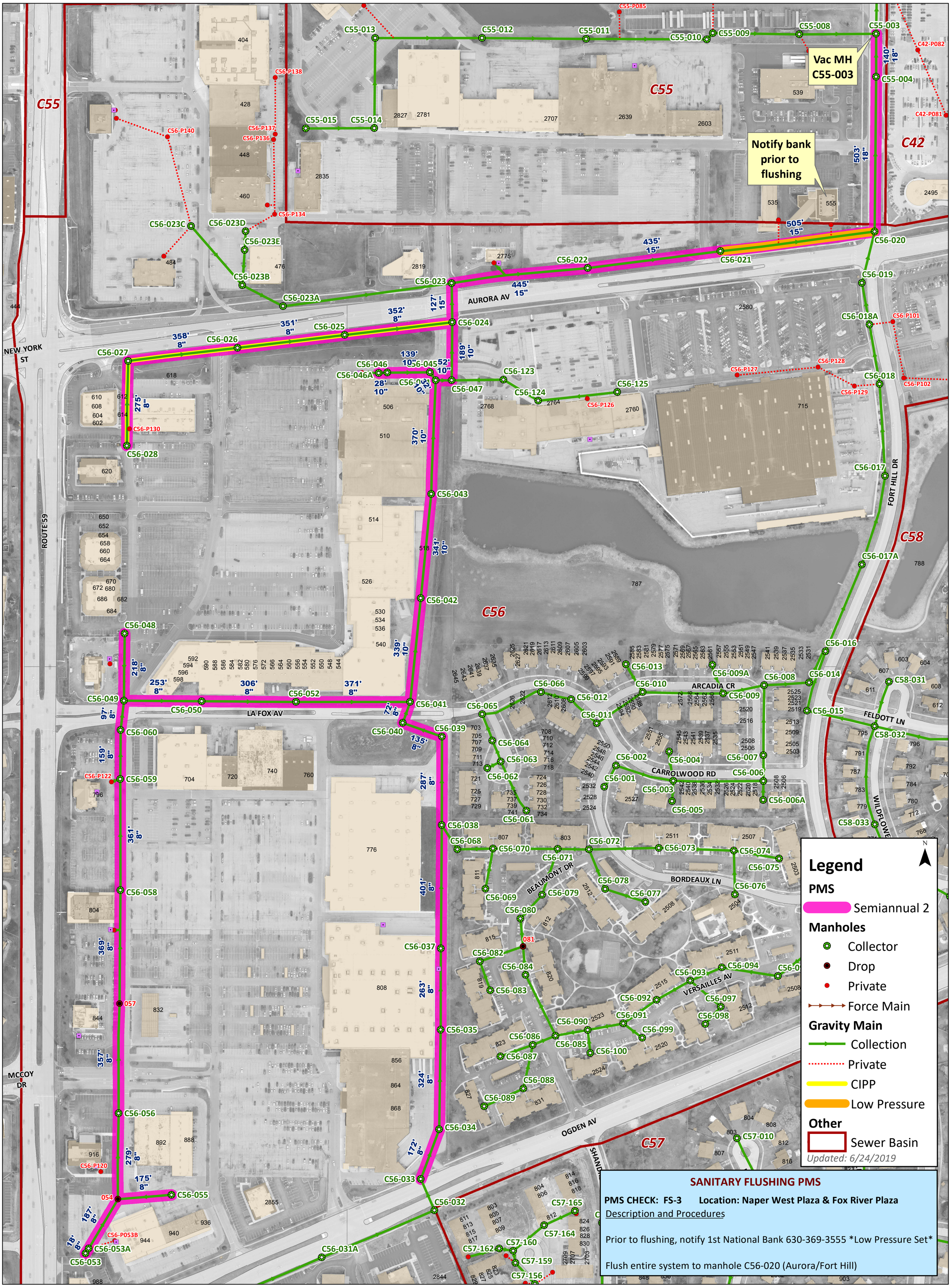
SANITARY FLUSHING PMS

PMS CHECK: FS-2 Location: Ogden Grease Run

Description and Procedures

Flush ALL sidelines from Sleight to Brainard including Loomis



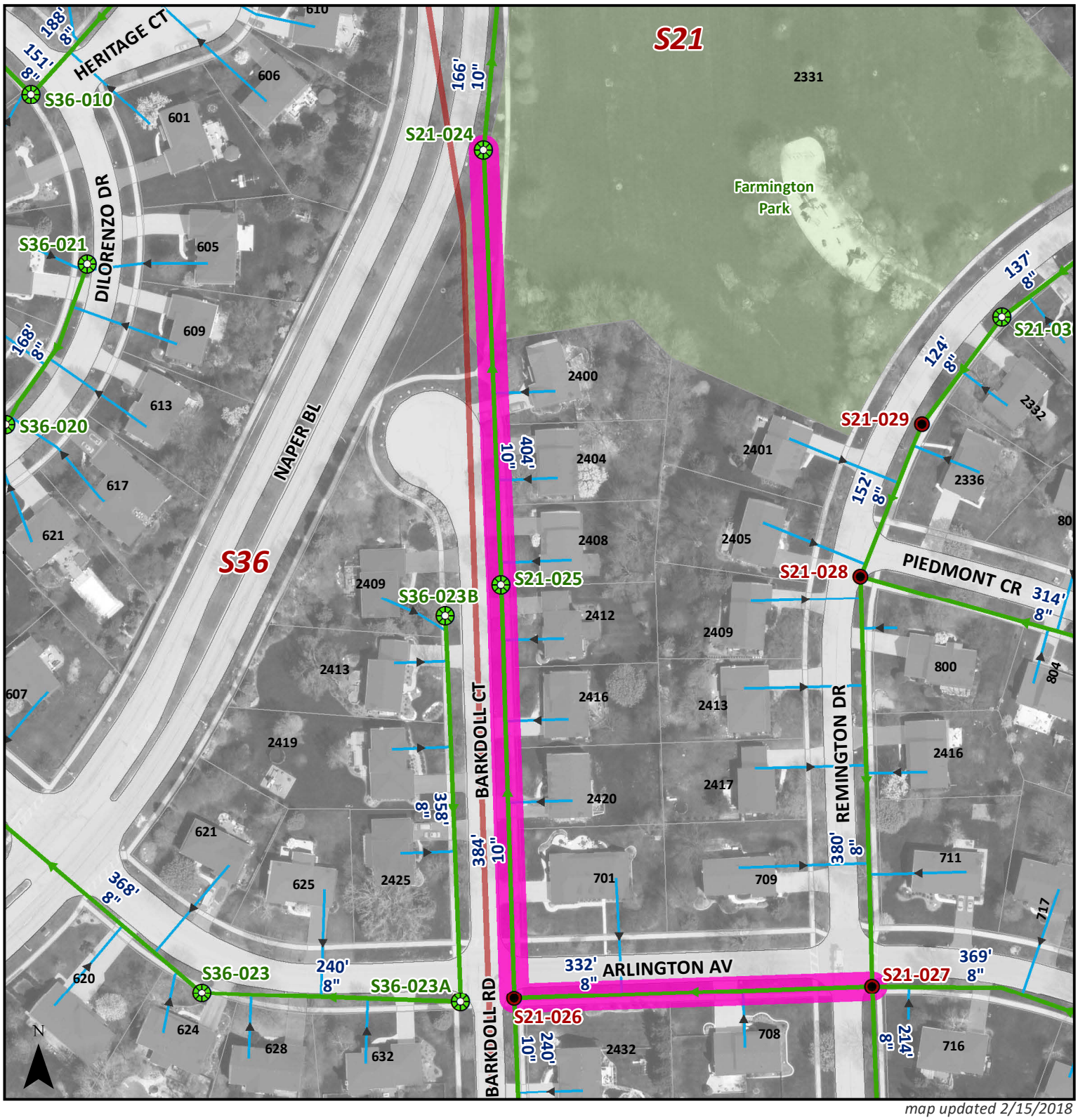

Vac MH
C55-003
Notify bank
prior to
flushing
C55
C42
C56
C57
C58
AURORA AV
NEW YORK
ST
ROUTE 59
LA FOX AV
FORT HILL DR
ARCADIA CR
CARROLWOOD RD
FELDOTT LN
WILDFLOWE
BEAUMONT DR
BORDEAUX LN
VERSAILLES AV
OGDEN AV
MCCOY
DR
Legend
PMS
Semiannual 2
Manholes
Collector
Drop
Private
Force Main
Gravity Main
Collection
Private
CIPP
Low Pressure
Other
Sewer Basin
Updated: 6/24/2019
SANITARY FLUSHING PMS
PMS CHECK: FS-3 Location: Naper West Plaza & Fox River Plaza
Description and Procedures
Prior to flushing, notify 1st National Bank 630-369-3555 *Low Pressure Set*
Flush entire system to manhole C56-020 (Aurora/Fort Hill)

SANITARY FLUSHING PMS

PMS CHECK: FS-4 **Location: Barkdoll Ct, Arlington Av**

Arlington Av: S21-027>026
Barkdoll Ct: S21-026>025>024

<u>Description and Procedures</u>
Heavy Grease



map updated 2/15/2018

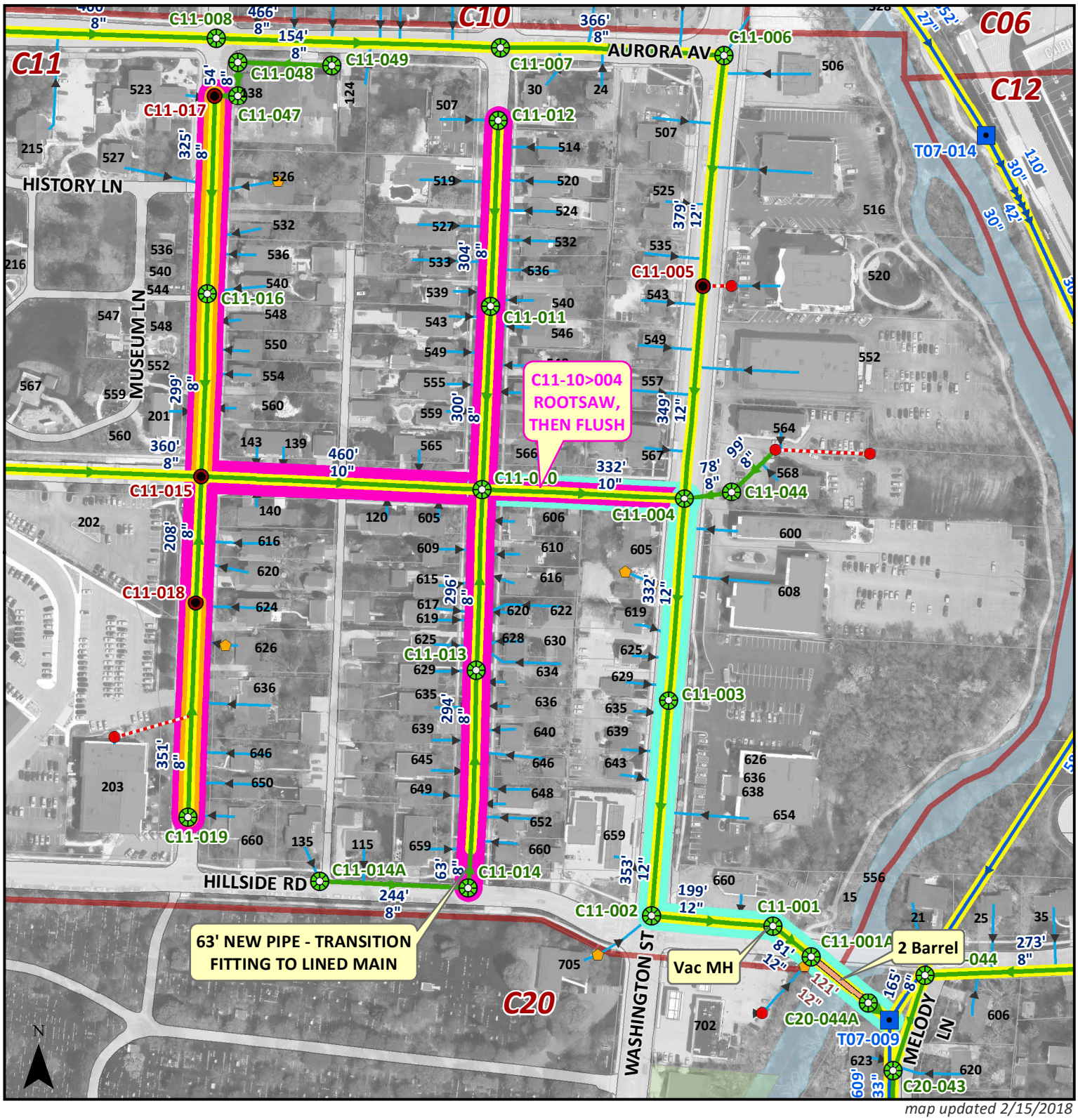
SANITARY FLUSHING PMS

PMS CHECK: FS-5 Location: Webster, Main, Porter, Washington, Hillside

Description and Procedures

ROOTSAW: Webster St: C11-017>016>015 AND C11-019>018>015
Main St: C11-012>011>010 AND C11-014>013>010
Porter Av: C11-015>010>004

FLUSH: Washington St: C11-004>003>002
Porter Av: C11-010>004
Hillside Av: C11-002>001>001A>C20-004A>T07-009



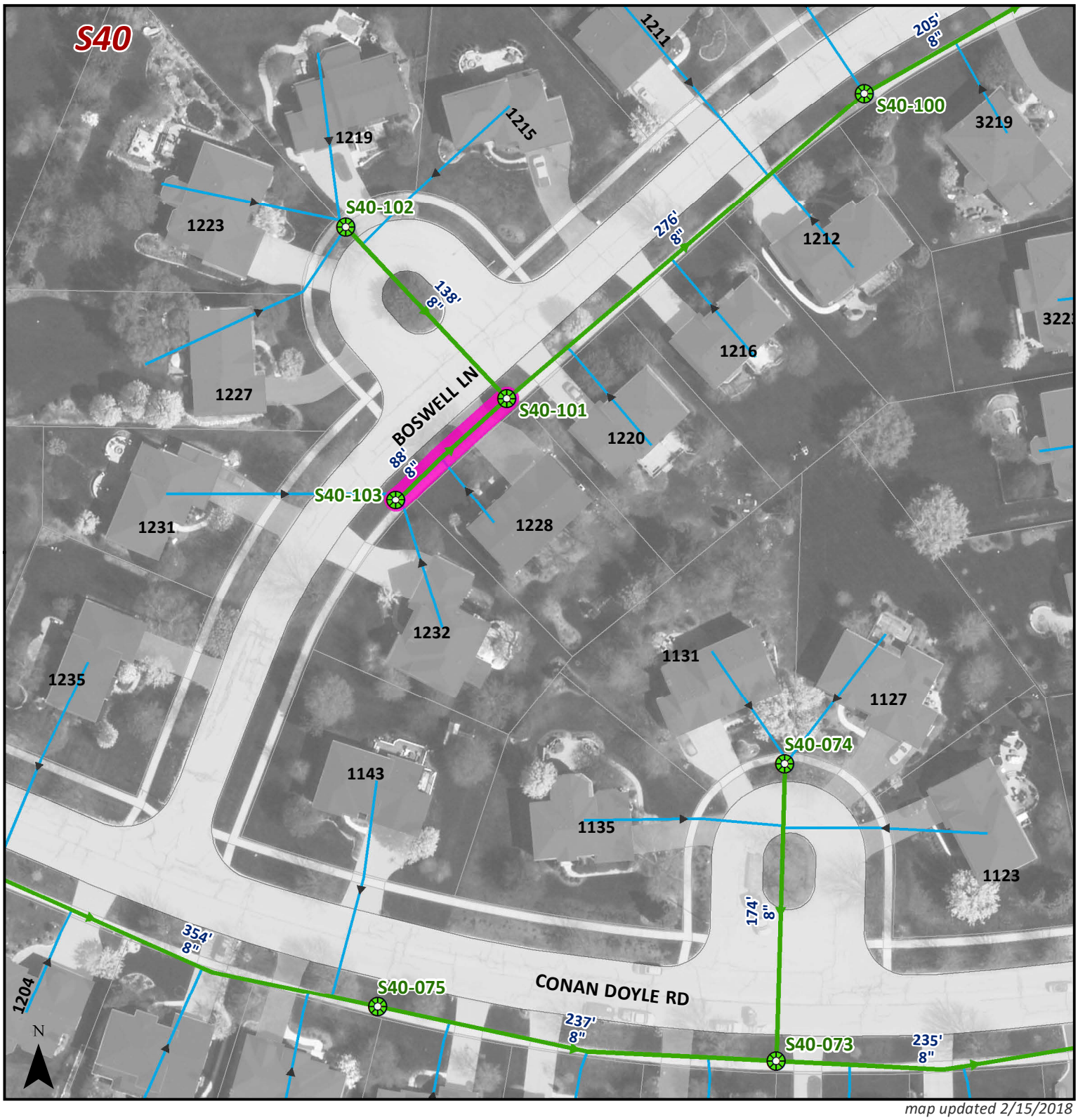
map updated 2/15/2018

SANITARY FLUSHING PMS

PMS CHECK: FS-7 **Location: Boswell Ln**

S40-103>S40-101

<u>Description and Procedures</u>
Flat – Heavy Rags, flush until clear



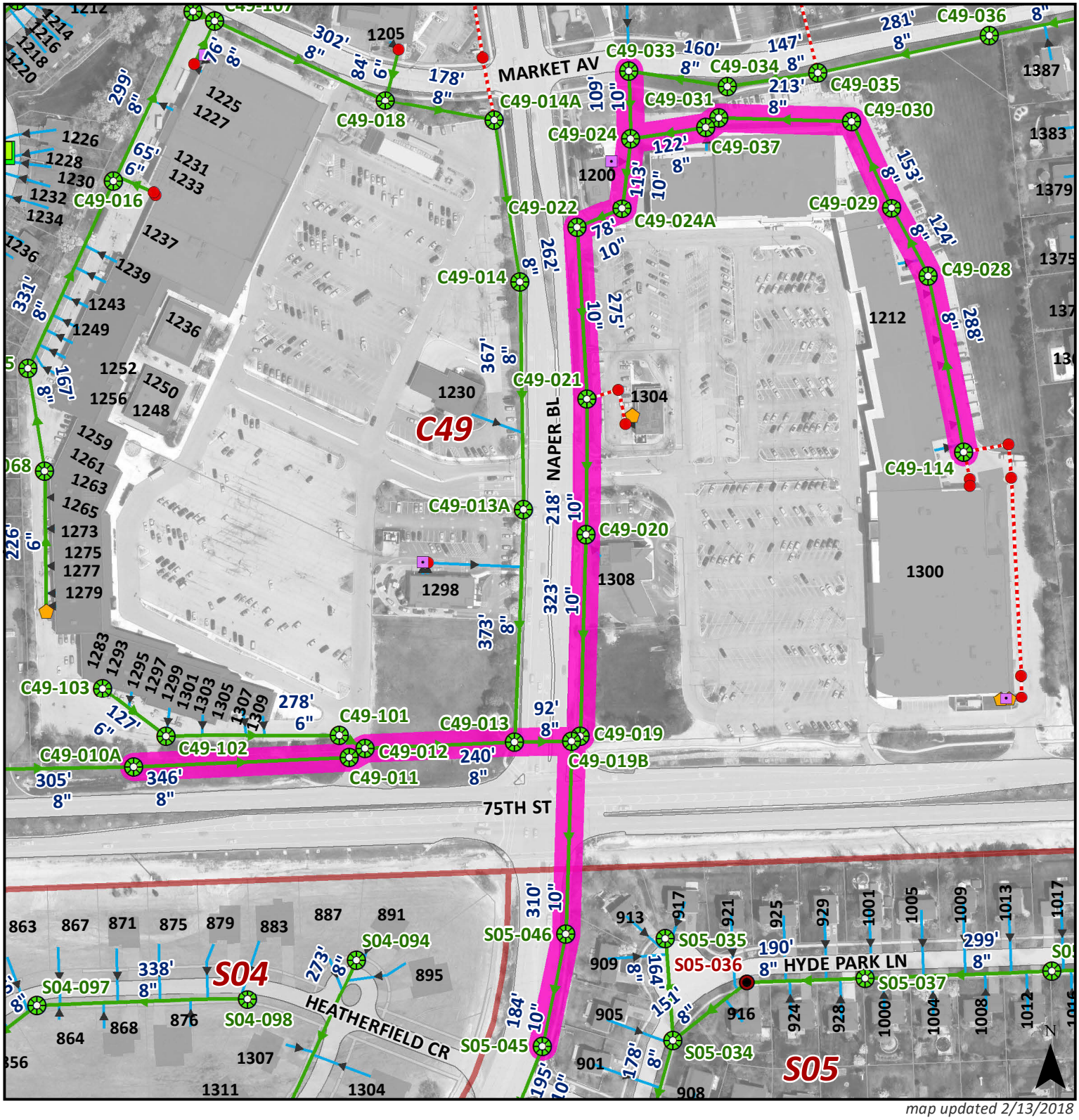
map updated 2/15/2018

SANITARY FLUSHING PMS

PMS CHECK: FS-8 **Location: Fox Run Square/Market Meadows**

Description and Procedures

Flush all highlighted sets to remove grease and grit



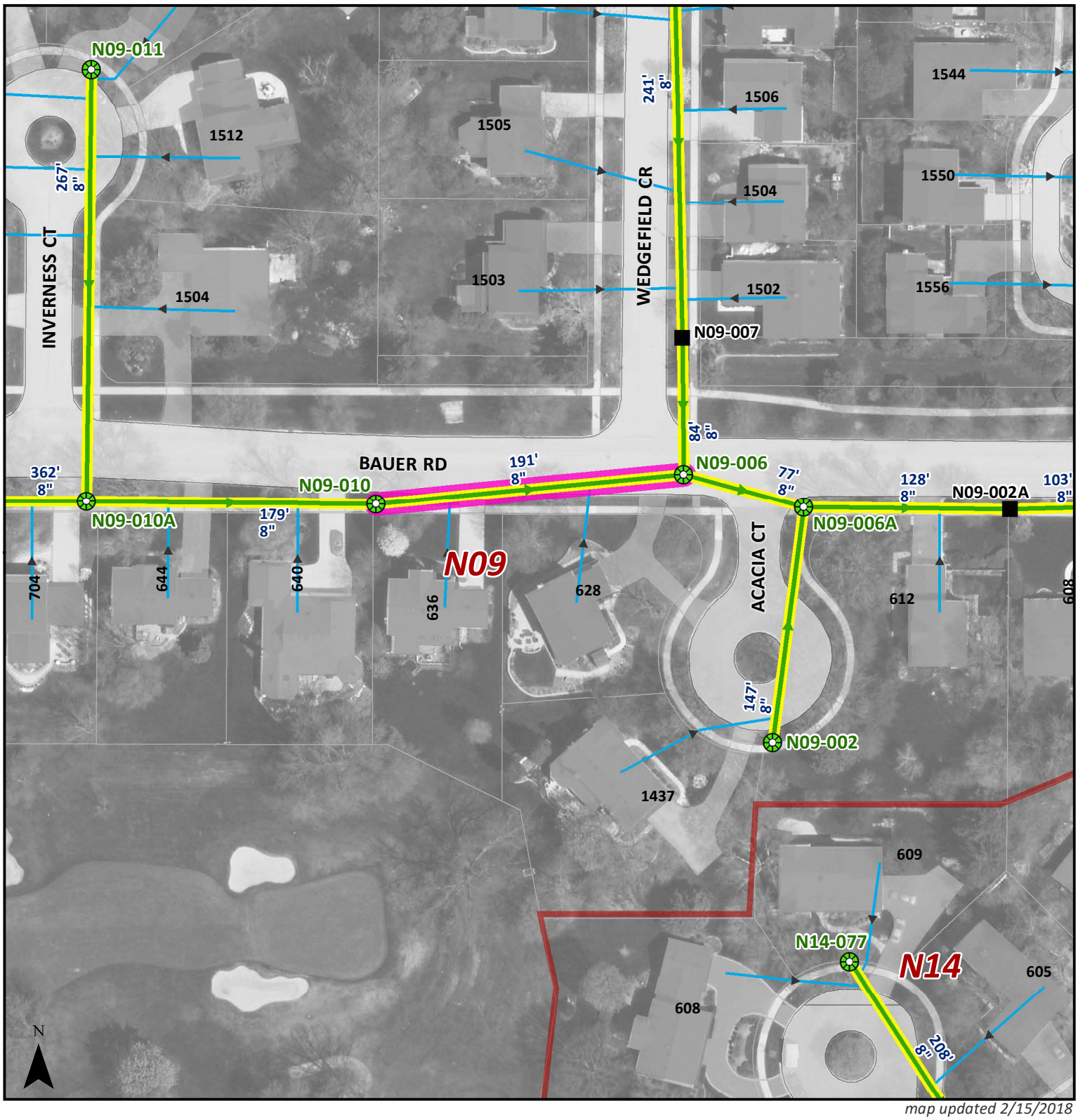
map updated 2/13/2018

SANITARY FLUSHING PMS

PMS CHECK: FS-9 **Location: Bauer Rd @ Wedgefield (Cress Creek)**

N09-010>N09-006

<u>Description and Procedures</u>
Flush – Belly collects grease



map updated 2/15/2018

SANITARY FLUSHING PMS

PMS CHECK: FS-10 **Location: River Bend**

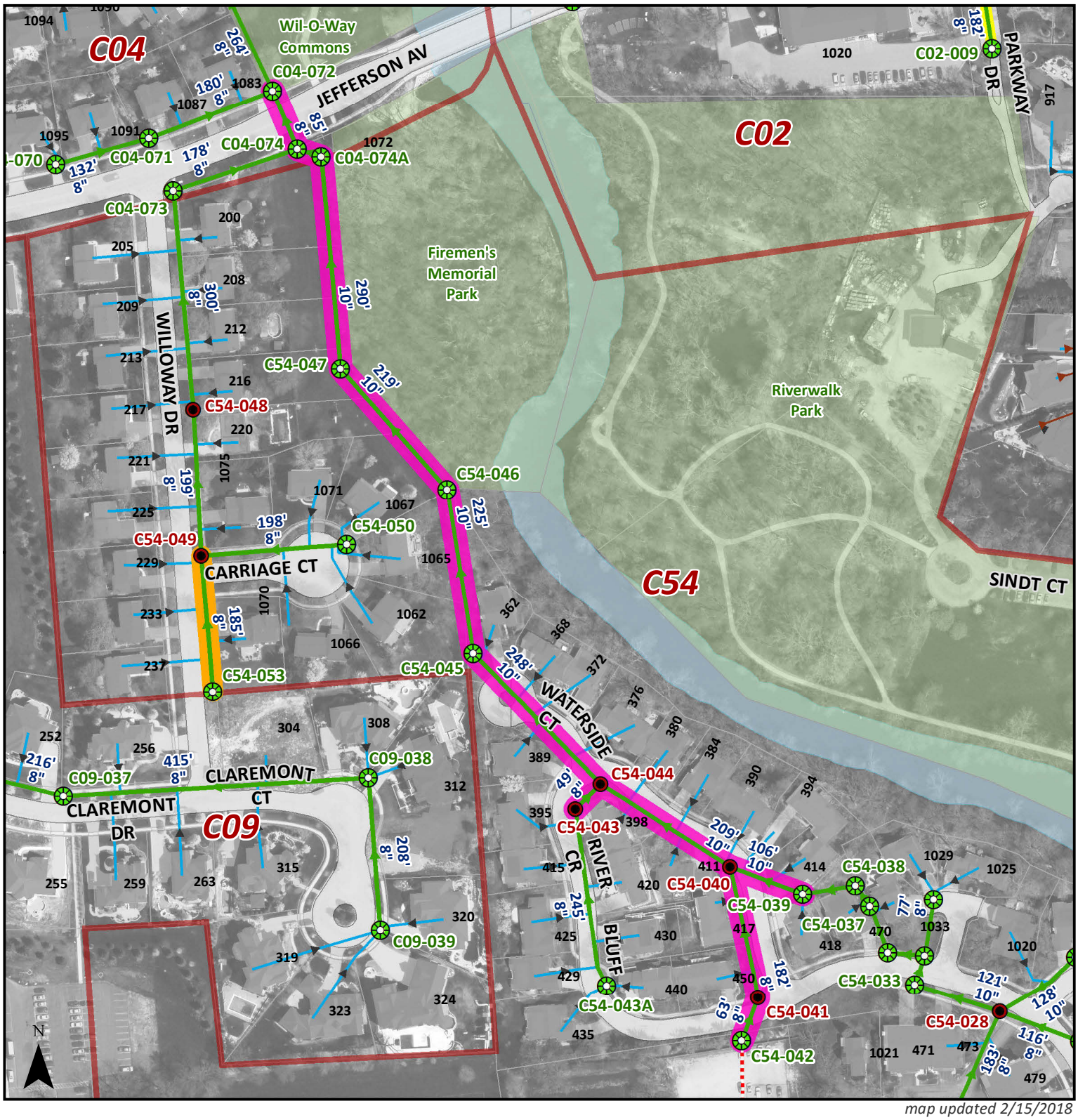
11 Sets

<u>Description and Procedures</u>

Heavy Grease from Meson Sabika

Several manholes have been landscaped over by residents

Flush across Jefferson to C04-072



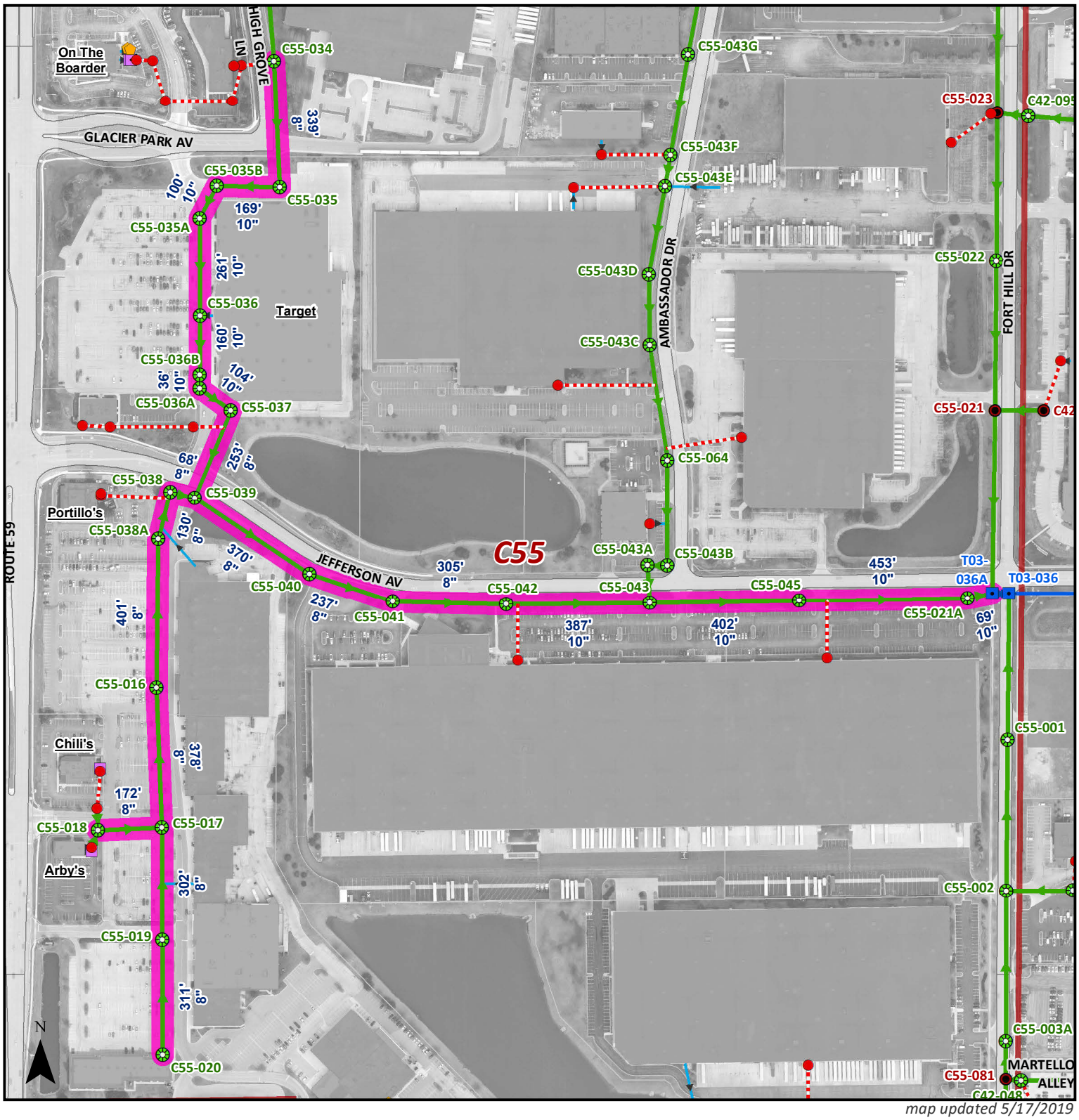
map updated 2/15/2018

SANITARY FLUSHING PMS

PMS CHECK: FS-11 **Location: Westridge Mall (C55)**

Description and Procedures

Heavy Grease from restaurants



map updated 5/17/2019

SANITARY FLUSHING PMS

PMS CHECK: FS-12 **Location: Commons Dr and William Penn Dr**

N09-085>N09-086

<u>Description and Procedures</u>

Flush using Grease Nozzle – belly collects grease

map updated 2/13/2018

SANITARY FLUSHING PMS

PMS CHECK: FS-13 **Location: Rose Ln @ Elmwood Dr**

C28-050>C28-049

<u>Description and Procedures</u>
Low Pressure

map updated 2/13/2018

SANITARY FLUSHING PMS

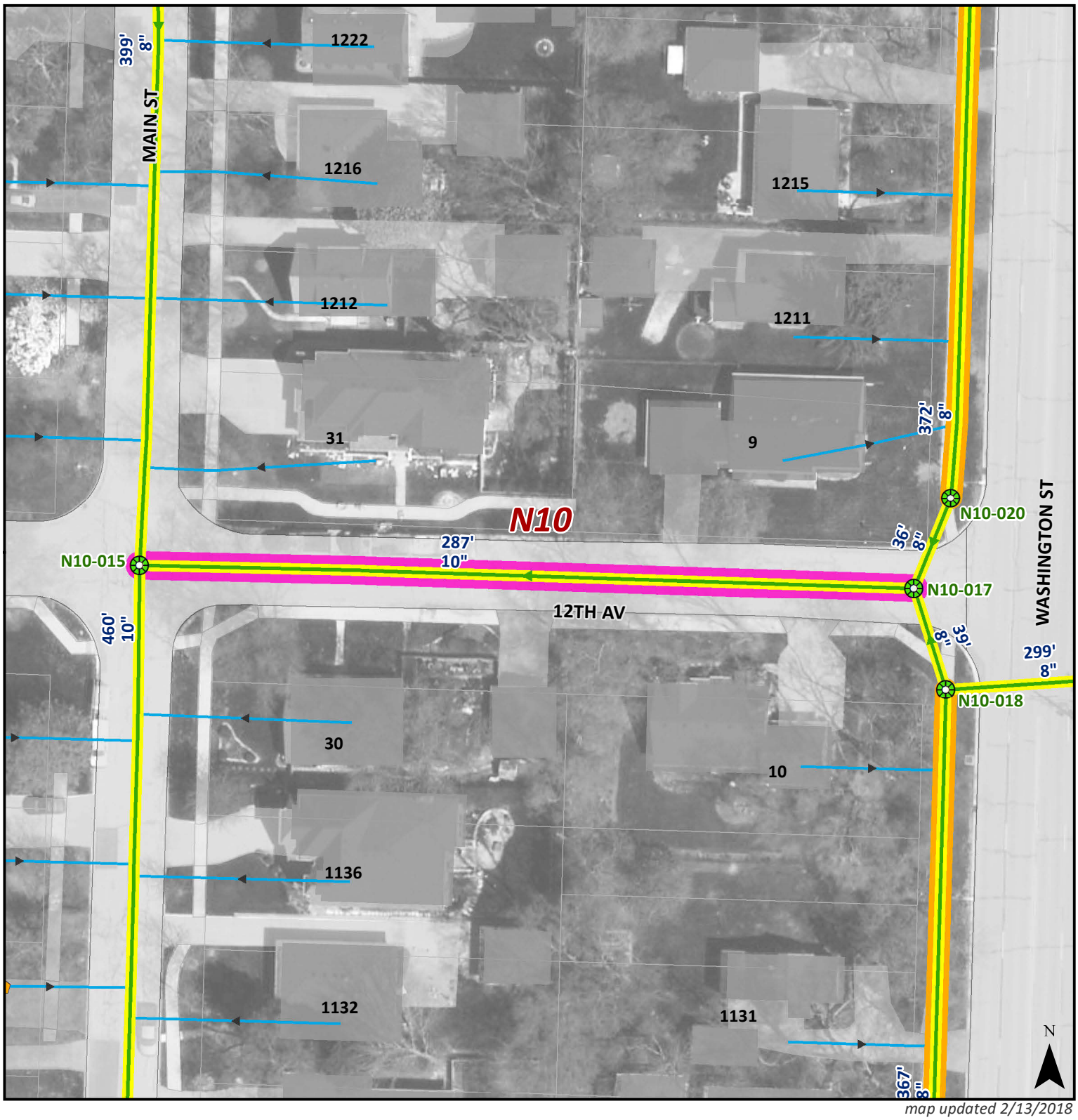
PMS CHECK: FS-14 **Location: 12th St and Washington St**

N10-017>N10-015

<u>Description and Procedures</u>

Belly collects Heavy Grease – Flush using spinner nozzle only – Flush at least 3x

Belly is approximately 140’ east of MH N10-015



map updated 2/13/2018

SANITARY FLUSHING PMS

PMS CHECK: FS-15 Location: Caputo's Grease Run

Description and Procedures

Use Spinner Nozzle

Clean from behind Caputo's to Route 59,

South along Route 59 Starting at W24-020,

Clean behind Strip mall with Melting Pot, Redhots, Burrito,

and east thru Harmony Grove (Fairhauser to Chokeberry to Clearwater)

SANITARY FLUSHING PMS

PMS CHECK: FS-16 **Location: 1907/1913 Coach Dr**

S15-039A>039B>041

Description and Procedures

Grease collecting in pipes

Open cleanouts at 1907 & 1913

map updated 2/12/2018

SANITARY FLUSHING PMS

PMS CHECK: FS-17

Location: Ranchview Dr
Near Cinnamon Creek Lift Station

S30-103>S30-102>S30-101>WETWELL

Description and Procedures

REVERSE FLUSH INTO WETWELL. BE SUPER CAREFUL!!

map updated 2/26/2018

SANITARY FLUSHING PMS

PMS CHECK: FS-18 **Location: Charles - Between Elizabeth and Cheshire**

Description and Procedures

FLUSH C15-016>C15-014>C15-012

CAUTION: Offset joint lined over C15-014>C15-012

*Notify resident @ 1036 Elizabeth prior to flushing & Open Cleanout

map updated 2/12/2018

SANITARY FLUSHING PMS

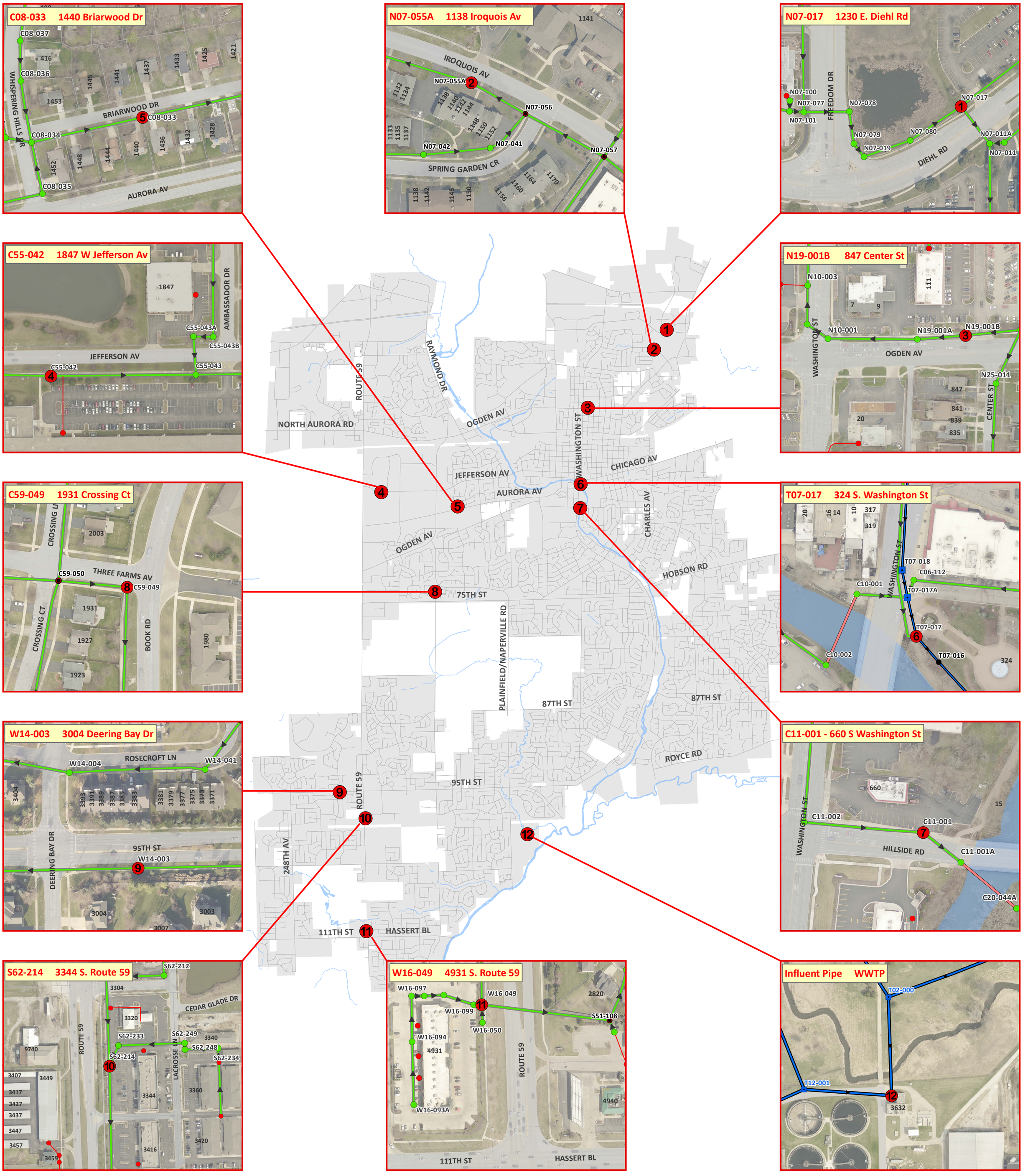
PMS CHECK: RS-1 **Location: Douglas Av – west of Eagle St**

Description and Procedures
Rootsaw C05-091>C05-090

map updated 2/23/2018

GREASE SAMPLE SITES

N
Not to Scale



LEGEND

9 Grease Sample Site

Manholes
- Collection
- Drop
- Interceptor
- Private

Gravity Main
- Collection
- Interceptor
- Siphon
- Private

DEPARTMENT OF PUBLIC UTILITIES - WATER
Water Distribution & Collection
Created By: Kevin Steltzriede, Utility Specialist
10/14/2019

Naperville

PAYMENT AGREEMENT FOR STORM WATER DISCONNECTION FROM THE SANITARY SEWER.

The Department of Public Utilities-Water recognizes that certain areas of the city are more susceptible to reoccurring sanitary sewer backups due to heavy rainfall surcharges. We are committed to reducing the frequency and severity of these surcharges. We are offering you participation in our storm water disconnection program. This allows you to remove any storm water device such as sump pumps, gutters etc. that are improperly hooked to the sanitary sewer system. The City will reimburse you the homeowner 75% of the cost. We are doing this, although we have no direct responsibility to do so, to reduce the amount of wastewater backups caused by Inflow and Infiltration issue in the sanitary sewer system. This agreement only covers the cost to remove the storm water device and redirect the discharge outside the home.

The conditions for this transaction are as listed below:

A) Homeowner must obtain (3) written quotes and send copies of the quotes to the Collection & Pumping Supervisor for preauthorization prior to any work beginning. These quotes must include restoration. The City will make only one payment. Once the City has given you authorization you may schedule the work. The City will normally select the lowest quote but reserves the right to reject all quotes should they exceed usual and customary charges for this type of installation.

B) Upon completion of the installation, the Homeowner must submit proof of payment for the installation to the Collection & Pumping Supervisor. Payment will then be made by the City for 75% of the agreed on quotation. This will be paid to the customer. No payment will be made to the plumber. This transaction is between the DPU Wastewater Utility and the customer, not the plumber.

C) The City assumes no responsibility for the selection, installation, maintenance or operation of any device(s). Any future costs related to maintenance or repair of the device will be paid by the Homeowner.

D) If you perform the work yourself, and the cost of materials is less than $100, please send copies of your material receipts to the City for review. The city will review your receipts and process your reimbursement (for materials only).

E) A 12 month a re-inspection of the disconnection will be required.

CUSTOMER NAME _____

ADDRESS_____

PHONE _____

DESCRIPTION OF WORK_____

QUOTE #1 PRICE _____ PLUMBER_____

QUOTE #2 PRICE _____ PLUMBER_____

QUOTE #3 PRICE _____ PLUMBER

CITY'S 75% PAYMENT_____ _____

CONDITIONS/PAYMENT AGREED TO BY:

_____ _____

Customer Signature Date

_____ _____

Collection & Pumping, Supervisor Date

Date Installation Completed _____ Plumber_____

Return to: **Dept. of Public Utilities – Water, Attn: Collection & Pumping Supervisor;**
1200 W Ogden Ave, Naperville, IL 60563

DISCONNECTION OF STORM WATER
DISCHARGE TO THE SANITARY SEWER PROGRAM
HOLD HARMLESS AGREEMENT
(Required for program participation)

In consideration for reimbursement by the CITY of costs incurred under the terms of the storm water disconnection programs, I, the customer, agree to release, waive, discharge and hold harmless the CITY, it's officers, agents, servants, representatives and employees from any and all liability, claims, demands, actions and causes of action whatsoever arising out of or related to any loss, damage, or injury, including death, that may be sustained by me, or any of the property owned by me, as a result of my participation in the storm water disconnection program and the installation of any device. I further understand that my acceptance into the program by the CITY in no way implies liability by the CITY for any injury or property damage sustained by me as a result of any prior or future sanitary sewer backup.

The terms set forth herein shall be in full force and effect during my participation in the program and shall survive thereafter, and shall be binding upon my heirs, executors and representatives.

_____ _____
Customer Signature Date

North Operations Center (NOC) and South Operations Center (SOC)
Wet Weather Holding Lagoons Procedure

The holding lagoons at NOC & SOC are designed to offload sanitary flows during wet weather events to relieve potential surcharging in the collections system. When wet weather flows subside, the holding lagoons are drained back into the collection system.

NOC:

1. Close lagoon drainback valve (on north berm outside fence) as directed by supervisor or field supervisor. Valves may be closed prior to forecasted heavy rain events.

2. Once heavy rainfall starts, monitor wetwell levels at NOC and NW pump stations via SCADA. Monitor the weather and street and river flooding.

3. Make sure the holding lagoon drainback valve is closed.

4. The first high wetwell level for NWPS is 14.5 at which point the divertible opens. The divertible valve between NOC & NWPS is programmed to balance flows between these two stations. You can override the levels to operate the divertible valve with management approval.

5. When NOC wet well reaches 17' and NW wet well reaches 17' and levels continue to rise, pump to the NOC holding lagoon by operating the NOC actuator valve per programming. You can override set points to divert flow with management approval.

6. Monitor flows at May Watts Park via SCADA

7. Monitor the lagoon level, NOC and NW wet well levels and the weather. If Lagoon is reaching capacity notify a supervisory immediately. NOC wet well level – 22' backups in Cress Creek, NW wet well level – 22' backups Redfield Dr.

8. NOC lagoon levels need to be continuously monitored via visual inspection while actively pumping to the lagoon.

9. Stop pumping to the lagoon when NOC & NW wet well levels begin to drop and weather permits. Close the NOC actuator valve. Open force main drain valve from the lagoon to the NOC wet well. Monitor SCADA to ensure May Watts is not being overwhelmed by drainage entering system.

10. Goal is to drain the lagoon back into the sanitary system as soon as possible.

11. Once lagoon is drained, wash down and clean lagoon and treat the lagoon for odor control.

12. If the 10" Baker pump is required at any time during high flows, use bypass under front entrance or set up hose with road ramps. Notify Fire Station #9 if using road ramps.

SOC:

1. Monitor SCADA levels at SOC pump station. Monitor the weather and street flooding.

2. Make sure the holding lagoon drain back valve is closed.

3. Stage 10" Thompson pump and hoses near bypass manhole should it be needed.

4. When SOC wet well reaches 15' the Flygt pump will operate and pump to the lagoon.

5. When SOC Wet well reaches level of 17.5' (per program) the forcemain divertible valve to lagoon opens.

6. While pumping to lagoon, continuously monitor wetwell level, pump operations, Flygt pump, and divertible valve operations. If lagoon is nearing capacity, notify as supervisor immediately.

7. SOC wet well level – 22' backups Lemington and Chatham Ct.

8. Stop pumping to the lagoon when SOC wet well levels begin to drop and weather permits.

9. Drain the lagoon into the sanitary system. Monitor SCADA to while draining to ensure the system downstream is not overwhelmed by the drainage.

10. Treat the lagoon for odor control ASAP.

11. Make sure SOC 24" force main diversion valve is closed 100%.

Any lagoon overflows - Follow Overflow Response Plan

NOC Storage Lagoon

SOC Storage Lagoon

Memorandum of Understanding Between the City of Warrenville and the City of Naperville Regarding Interceptor Sanitary Sewer Capacity

(last updated by the City of Warrenville Public Works Department on 2/8/18)

This Memorandum of Understanding (MOU) has been prepared to memorialize recent discussions between the City of Warrenville and the City of Naperville regarding how Warrenville and Naperville can work together to monitor and address capacity constraints in Naperville's interceptor sanitary sewers along River Road, between approximately I-88 and Naperville's Northwest Pump Station at Ogden Avenue, especially as it relates to the anticipated full buildout conditions of Warrenville and that area of Naperville tributary to its Northwest Pump Station.

The City of Naperville has agreed to convey and treat up to 17,400 population equivalents (PE) from the City of Warrenville. The City of Warrenville is charged for conveyance and treatment on a monthly basis based on the Warrenville's percentage of flow of the total volume. The City of Naperville also has agreed to sell up to 10,000 PE of additional conveyance and treatment capacity for the Cantera Development for a total conveyance and treatment capacity (the City of Warrenville plus Cantera) not to exceed 27,400 PE. As of January 1, 2018, Warrenville has purchased 25,048 population equivalents (PE) of average daily flow of sanitary sewer transport and treatment capacity from Naperville, with the right to purchase an additional 2,352 PE, for a total of 27,400 PE. The following intergovernmental agreements (collectively the "IGA's") between the City of Warrenville and the City of Naperville document these rights:

1. Warrenville Agreement No. 49, and Naperville Resolution 82-4 later amended under Ordinance No. 84-200: Agreement for Wastewater Utility Service Between City of Warrenville and City of Naperville, dated April 5, 1982 – This agreement documents the original 17,400 PE of Naperville transport and treatment capacity allotted to Warrenville for all of its residential, commercial and industrial wastewater discharges.

2. Warrenville Ordinance No. 1345, and Naperville Ordinance No. 94-81: Second Amendment for Wastewater Utility Service Between the City of Warrenville and the City of Naperville, dated May 17, 1994 (the "Second Amendment") – This amendment documents that the City of Warrenville may purchase up to 10,000 PE of treatment capacity for the Cantera Development. As of January 1, 2018, Warrenville has purchased 7,648 PE of the maximum capacity of 10,000 PE, with the right to purchase an additional 2,352 PE.

Warrenville performed an analysis to calculate the anticipated full buildout residential population and total additional PE for the City (the "Buildout Analysis") (Exhibit 1). The Buildout Analysis projects the full buildout residential population of Warrenville will be 17,252 (this number excludes commercial and industrial uses and is not an accurate representation of the total connected load or flow). Exhibit 2 is a

summary of the total buildout sanitary sewer flow analysis and the actual existing sanitary sewer flows from Warrenville. Assuming the remaining sewer and treatment capacity is purchased within the Cantera development, at full buildout, Warrenville's projected average daily flow will not exceed the 27,400 PE of sanitary sewer transport and treatment capacity that Warrenville has purchased or has the right to purchase from Naperville, under the IGA's.

In section 2 of the "Second Amendment", Naperville has the right to direct Warrenville to design and construct a holding tank to reduce peak wastewater output from the Warrenville Development Property (aka Cantera). The holding tank will be sized in accordance with the criteria established in Exhibit 3, the Wastewater Study for Elmhurst-Chicago Stone Company Warrenville Quarry Development, prepared by SDI Consultants, Ltd., and dated October 12, 1990 (the "Wastewater Study").

WARRENVILLE COMMITMENTS

1. Develop and implement an Infiltration and Inflow (I/I) Reduction Program. Development of the program is underway, with Warrenville's sanitary sewer system divided into eleven (11) basins. Implementation of the first phase of the first basin is proposed in Warrenville's FY 2019 budget, and will be presented at the February 12, 2018, City Council Committee of the Whole meeting.

2. Work with Naperville to develop a scope of work for an engineering consultant, to be hired by Warrenville, to update the Wastewater Study to reflect current conditions and updated sanitary sewer flow projections associated with the anticipated full buildout conditions in Warrenville and that area of Naperville tributary to its Northwest Pump Station. This will be completed within three (3) months of the approval of this MOU.

3. Contract with a qualified engineering consultant (the "Consultant") and update the Wastewater Study to reflect current conditions and updated sanitary sewer flow projections associated with and the anticipated full buildout conditions in Warrenville and that area of Naperville tributary to its Northwest Pump Station. This will be completed within twelve (12) months of the approval of this MOU.

4. Consistent with section 2 of the Second Amendment, Warrenville will design and construct a holding tank to reduce peak wastewater output from Warrenville, in accordance with the criteria established in the updated wastewater study prepared by Warrenville.

   It is possible that the most appropriate location for this holding tank could be outside of the Cantera Development, and will require property acquisition. Warrenville will use its best efforts to complete necessary property acquisition for the holding tank within twelve months of the date it receives written notification, sent by certified mail to the City Administrator, from Naperville that this improvement is required.

Warrenville will use its best efforts to complete the design and construction of this facility within eighteen (18) months of acquiring the required property for this improvement, and Naperville notifying Warrenville in writing that this improvement is required.

NAPERVILLE COMMITMENTS

1. Approve all properly completed Illinois Environmental Protection Agency (IEPA) permit applications for public and private sanitary sewer extensions in Warrenville, provided (i) said permit applications are generally consistent with the projections contained in the Buildout Analysis and (ii) Warrenville is fulfilling its commitments outlined above.

2. Within two (2) weeks of a written request from Warrenville or its Consultant, meet with Warrenville and its consultant to develop the scope of work for the update of Exhibit 3. For this item, e-mail is an acceptable form of written request.

3. Within two (2) weeks of a written request from Warrenville or its Consultant, provide Naperville's flows, projected buildout, and other information required for Warrenville to fulfill its commitments, to Warrenville or its consultant. For this item, e-mail is an acceptable form of written request.

4. Within four (4) weeks of Warrenville submitting the initial draft of the update of Exhibit 3, Naperville will review the submittal and provide written comments and questions to Warrenville. For this item, e-mail is an acceptable form of written communication.

5. Within two (2) weeks of Warrenville submitting any subsequent version of the update of Exhibit 3, Naperville will review the submittal and provide written comments and questions to Warrenville. For this item, e-mail is an acceptable form of written communication.

CITY OF NAPERVILLE

Authorized Signature Douglas A. Krieger

Printed Name Douglas A. Krieger

Title City Manager Date 2/9/18

CITY OF WARRENVILLE

Authorized Signature John M Coakley

Printed Name John M. Coakley

Title City Administrator Date 2/8/2018

EXHIBIT 1

CITY OF WARRENVILLE
FULL BUILDOUT POPLUATION ANALYSIS

(Last updated by City of Warrenville Public Works 2/8/18)

Process for Estimating Full Buildout Population

Step One: Identify all properties in Warrenville's planning area that are either unincorporated, vacant, or not currently developed in a manner consistent with its Comp. Plan (see Appendix 1 Map). It is important to recognize that Warrenville's comprehensive plan is actually a combination of the following three components:

- The comprehensive land use plan Warrenville approved (Ordinance No. 714) in 1984 for the City's entire planning area. A copy of this plan is available at the following City website link: http://www.warrenville.il.us/DocumentCenter/View/1231. According to Table 2 in Chapter 2 of this plan (page 27), Warrenville's ultimate population was projected to be 21,750.
- The subarea land use plan Warrenville approved (Ordinance No. 2371) in 2007 for the 112 acre geographic area Warrenville refers to as the Old Town/Civic Center Area. A copy of this plan is available for review at the following City website link: http://www.warrenville.il.us/DocumentCenter/View/324
- The subarea land use plan Warrenville approved (Ordinance No. 3008) in 2016 for the 370 acre geographic area Warrenville refers to as the Southwest District. A copy of this plan is available for review at the following City Website link: http://www.warrenville.il.us/index.aspx?nid=611

Step Two: Create and use the Excel spreadsheet included in Appendix 2 to:

- Estimate the current population for each property identified on the Appendix 1 Map based on current use. The population generation table Warrenville and Naperville use to calculate school, park, and library land/cash contribution requirements for new residential development (Appendix 3) was used to make these estimates.
- Calculate the net increase in population that would result if each of these properties was developed with the land uses reflected in Warrenville's Comprehensive Plan and at densities that would be realistic from a market, regulatory, and political perspective.

Step Three: Calculate Warrenville's ultimate buildout population by adding the projected net population increase from cell M132 in the Appendix 2 Excel spreadsheet (3,879) to the 2015 American Communities Survey (Appendix 3) population estimate for Warrenville (13,373) for a total of 17,252.

Process for Estimating Sanitary Sewer Population Equivalent Projections for Full Buildout

Step One: Same as Step One in process used to estimate City of Warrenville ultimate/full buildout population.

Step Two: Create and use the Excel spreadsheet included in Appendix 5 to estimate the additional population associated with all improved residential properties located within Warrenville's existing corporate boundaries but not connected to the City's sanitary sewer system. 2015 American Communities Survey (ACS) five year estimates (Appendix 3) and current Warrenville sanitary sewer account data was used to estimate there are currently 471 detached, single-family, residential dwelling units in Warrenville that are NOT currently connected to the City's sanitary sewer system. 2015 ACS bedroom breakdown percentages and Appendices A and B of Part 370 Illinois Recommended Standards for Sewage Works in Title 35 of the State of Illinois Administrative Code were used estimate that 1,410 people live in these 471 dwelling units.

Step Three: Use the Excel spreadsheet included in Appendix 2 to:

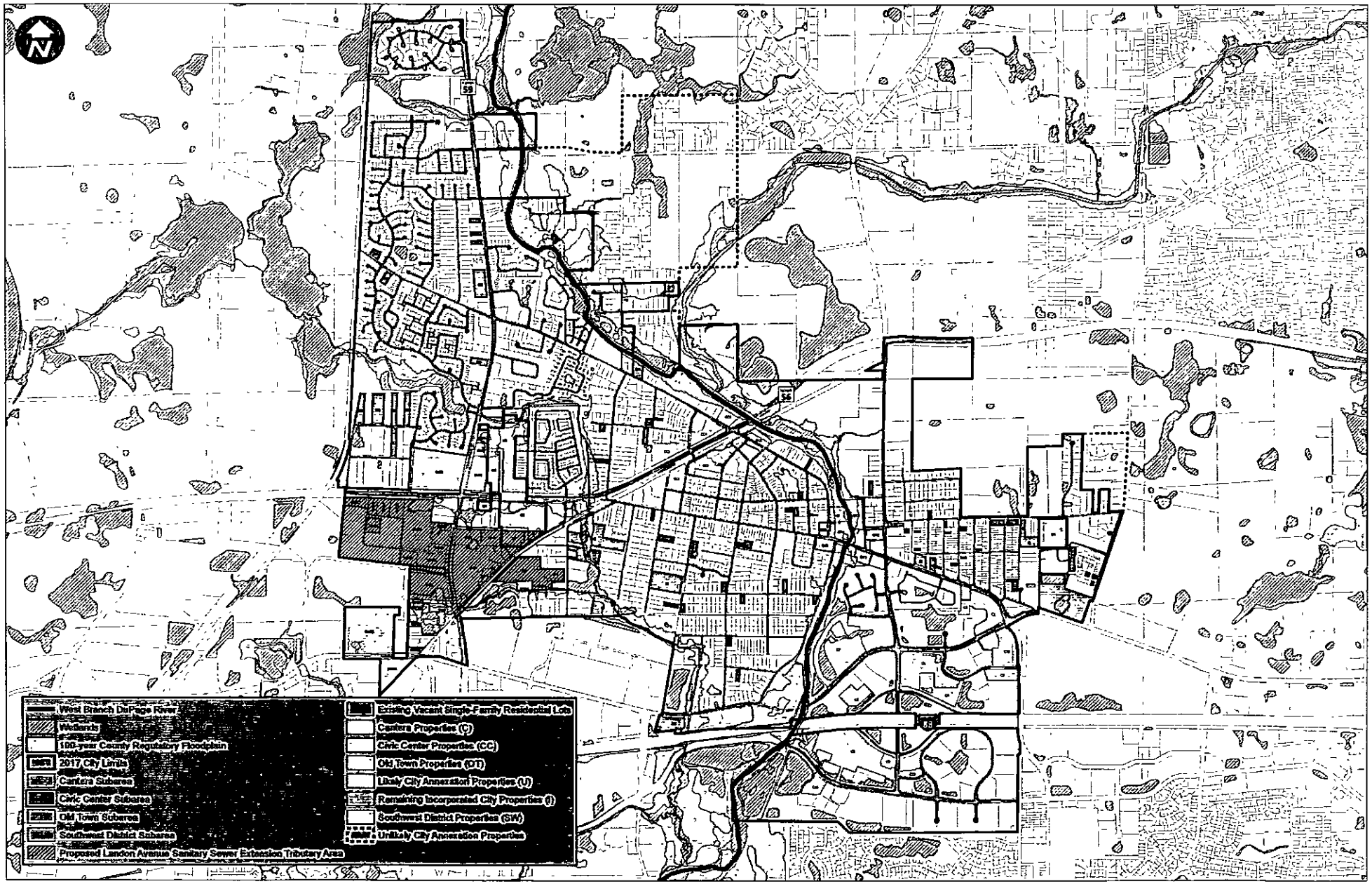
- Estimate the current population equivalent (PE) for each property identified on the Appendix 1 Map based on its current use and connection status to Warrenville's sanitary sewer system. This spreadsheet intentionally includes properties with existing non-residential buildings in Cantera that were vacant and not contributing to the existing average daily Cantera sanitary sewer flow.
- Calculate the net increase in PE that would result if each of these properties was (i) developed/fully occupied with the land uses reflected in Warrenville's Comp. Plan and at densities that would be realistic from a market, regulatory, and political perspective and (ii) connected to Warrenville's municipal sanitary sewer system. Appendices A and B of Part 370 Illinois Recommended Standards for Sewage Works in Title 35 of the State of Illinois Administrative Code was used to estimate the number of new residents/PE's that would be generated by the various types of future residential development anticipated in Warrenville. The PE data provided in Appendix 6 was used to estimate the additional sanitary sewer flow that would be produced by projected future senior housing and non-residential development.

Step Four: Calculate Warrenville's PE wastewater equivalent average daily flow at full buildout by adding the projected future PE increase reflected in cell L132 in the Appendix 2 Excel spreadsheet in millions of gallons per day (0.67 MGD) to the existing average daily wastewater flow data provided by Naperville, (1.78 MGD) for a total of 2.61 MGD.

Process for Estimating Sanitary Sewer Population Equivalent Projections for Landon Avenue Sanitary Sewer Extension Project

Step One: Identify all properties that would be tributary to the new sanitary sewer main that will be installed under this permit. These properties are identified in the hatched area on the map included in Appendix 1 as the "Proposed Landon Avenue Sanitary Sewer Extension Tributary Area" and in the last column of the Appendix 2 Excel spreadsheet.

Step Two: Use the Excel spreadsheet included in Appendix 2 to calculate the PE equivalent average daily wastewater flow that would result if each of the properties located within the proposed Landon Avenue Sanitary Sewer Extension tributary area was (i) developed with the land uses reflected in Warrenville's Comprehensive Plan and at densities that would be realistic from a market, regulatory, and political perspective and (ii) connected to Warrenville's municipal sanitary sewer system. The land use/PE data provided in Appendix 6 was used in these calculations. Where possible, Appendix 8 PE data mirrors Appendices A and B of Part 370 Illinois Recommended Standards for Sewage Works in Title 35 of the State of Illinois Administrative Code.


West Branch DuPage River
Wetlands
100-year County Regulatory Floodplain
2017 City Limits
Cantera Subarea
Civic Center Subarea
Old Town Subarea
Southwest District Subarea
Proposed Landon Avenue Sanitary Sewer Extension Tributary Area
Existing Vacant Single-Family Residential Lots
Cantera Properties (C)
Civic Center Properties (CC)
Old Town Properties (OT)
Likely City Annexation Properties (L)
Remaining Incorporated City Properties (I)
Southwest District Properties (SW)
Unlikely City Annexation Properties
59
56

APPENDIX 1

APPENDIX 2: Sanitary Sewer Population Equivalent Projections For Comprehensive Plan Buildout

Created by: R. Mentzer
Last Updated: 1/26/2018 KH

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7			EXISTING					FUTURE / PROJECTED								
8	Site #	Name	Net Site Area (3)	Zoning	Use	PE (1)	Notes	Comp Plan	Use	PE (1)	Notes (numbers are for Net Res Population Est)	Net PE Increase (1)(5)	Net Res Pop Inc. (1)(6)	IEPA Residental PE (2)	IEPA Non-Residential PE (2)	IEPA TOTAL PE (2)
9	CANTERA															
10	C1	MacCliff Lots 3-7	406,415	SD	vacant site	0		office/com	125,345 sf office	125	per 10/14 revised PUD	125		0	125	125
11	C2	North end Lot D-2	38,000	SD	vacant site	0		office	7,500 sf office	8	staff est.	8		0	8	8
12	C3	Liberty Mutual Lot F2	194,900	SD	vacant site	0		office	44,500 sf office	45	per PUD Ord. # 2797	45		0	45	45
13	C4	Lot F1B	388,121	SD	vacant site/parking	0		office	150,000 sf office	150	per PUD Ord. # 1734	150		0	150	150
14	C5	Lot F1A - Navistar	656,529	SD	vacant 260K office building	0		office	260,000 sf office	260	per PUD Ord #1734	260		0	260	260
15	C6	Lot E1B	304,616	SD	vacant site/parking	0		office	158,000 sf office	158	sf limited by 2006 san sewer covenant restriction	158		0	158	158
16	C7	Lot C2	1,219,680	SD	vacant site/stormwater det	0		office	201 1 -bed apt, 153 2-bed apt, 10 3-bed apt, 20 2-bed TH, 40 3-bed TH, 38,000 sf strip commercial, 8,000 quick srv rest	904	20-2bed twnhm (33.9 persons) /40-3bed twnhm (95.0 persons) /201-1bed apt (355.4 persons) /153-2bed apt (307 1 persons)/10-3bed apt.(25 3 persons), strip commercial (36.5), QS rest (51)	904	817	1001	89	1090
17	C8	Lot 6 in Resub of Lot G1	1,173,000	SD	underutilized parkmg lot area	0		commercial	109 room limited service hotel, 6,000 sf quick serve rest, 156 1-bed apt, 80 2-bed apt, 22 3-bed apt	700	per most recent Casto Development/EPR Build-out plan. 156-1bed apt (275 persons) /80-2bed apt (160 persons)/22-3bed apt.(55 7 persons), QS rest (45), hotel (164)	700	444	527	209	736
18	C9	Chuy's Restaurant	84,000	SD	new 6,500 sf Chuys restaurant	0	6/17 occupancy	commercial	6,500 sf Chuys	49		49		0	49	49
19	C10	Cantera Commons Lot I2	160,301	SD	largely vacant strip commercial center	24		commercial	6,655 sf strip commercial (6 7), 6,655 sf QS rest (42 4)	49		25		0	25	25
20	C11	Lot 2 in Resub of Lot H11	80,150	SD	vacant 3,322 sf quick serve rest.	0	6/17 occupancy	commercial	3,322 sf Skippy's	21		21		0	21	21
21	C12	Lot F6 - Mill St Office Condos	397,703	SD	vacant pad site	0		office	69,230 sf office	69	Per approved final PUD Plan	69		0	69	69
22																
23	Additional Cantera PE Subtotal at "Buildout"									2538		2514		1528	1208	2736
24																
25	OLD TOWN SUBAREA															
26	OT1	Old Town Redv Site #1	112,032	O1	vacant site	0		commercial	24,000 sf strip commercial	23	Per subarea plan	23		0	23	23
27	OT2	SEX 2nd St /Jefferson St	86,714	R3	3-3bed & 1-4 bed det sf homes	12	3-3bed sf (8 9) 1-4bed sf (3 6)	townhomes	9-2bed and 9-3bed twnhm	37	1 697/15.3 persons in 2bed, 2 374/21 4 persons in 3bed	25	25	49	0	49
28	OT3	Second Street Residential	85,052	R4	2-1bed apt , 2-2bed apt , 6-2bed and 6-3bed det sf homes	42	2-1bed apt (3 6) 2-2bed apt (4.0) 6-2bed sf (16.5) 6-3bed sf (17 7)	townhomes	7-2bed and 7-3bed twnhm	28	1 697/11 9 persons in 2bed, 2 374/16 6 persons in 3bed	-14	-14	-2	0	-2
29	OT4	Citgo/Old Town Red. Site #2/Vogtles	44,602	B4	11,000 auto service building	11		rest /retail	4,000 sq ft. sit down rest, 4,000 strip com	34	rest (29 9), strip com (3 8)	23		0	23	23
30	OT5	NWX Batavia/Warrenville Rds	59,879	B4/R4	1,700 com, 1-1bed apt , 3-2bed and 1-3bed det sf	13	1-1bed apt (1.8) 3-2bed sf (5.9) 1-3bed sf (3 6) strip com(1.6)	retail/apts	24 -2bed apt and 9,000 sf strip com, 3,000 sf QS rest	76	2.007/48 persons in 2bed apt., rest (19 1), com (8 6)	63	37	56.5	26	83
31	OT6	Bollweg/Behr Properties	94,653	B4/R3	9,500 com, 2-1bed apt, 1-1bed det. sf	15	2-1bed apt (3 5) 1-2bed sf (2 7) strip com (9 1)	retail/office	8,000 sf strip com/8,000 office	16	strip com (7 8), office (8)	1	-6	-6.5	7	0
32	Old Town Subarea at "Buildout"											121		97	79	176
33																
34	CIVIC CENTER SUBAREA															
35	CC1	CCRS #1	185,130	O1	vacant site	0	office/warehouse (50) office (1)	sf /twnhm	24 small lot sf./3 med. lot sf	66	2 374/55 8 persons in 24-3bed and 3.559/10.7 persons in 3-4 bed	66	66	94.5	0	95
36	CC2	Commercial @NWX Rockwell and Main	177,520	M1	15,000 office/30,000 warehouse	25	office (15), warehouse (10.2)	sr. housing/ twnhm	75 sr. housing units/7-2bed twnhm/7-3bed twnhm	122	1 697/11 9 persons in 2bed, 2.374/16.6 persons in 3bed, sr housing (53.8)	97	12	142 8	-25	118
37	CC3	Barnes Property	279,957	B4	10,000 office	10	office (10)	mixed use	5,000 sf strip commercial/45-1bed apt./45-2bed apt	175	1.768/79 6 persons in 1bed apt, 2.007/90.3 persons in 2bed apt, strip com (4 9)	165	160	202.5	-5	197

APPENDIX 2

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7					EXISTING				FUTURE / PROJECTED							
8	Site #	Name	Net Site Area (1)	Zoning	Use	PE (1)	Notes	Comp. Plan	Use	PE (1)	Notes (numbers are for Net Res Population Est)	Net PE Increase (1)(3)	Net Res Pop Inc (1)(3)	IEPA Residental PE (2)	IEPA Non-Residential PE (2)	IEPA TOTAL PE (2)
38	CC4	Walker Property	204,902	B4	vacant site	0		mixed use	29,000 sf strip com, 6,000 sf sit down rest /10-1bed apt /10-2bed apt	110	1.768/17 7 persons in 1bed apt, 2 007/20 1 persons in 2bed apt., com(27 8), rest(44 8)	110	38	45	73	118
39	CC5	NEX Batavia and Rt 56	109,480	B4/R2	1-3bed & 1-4bed det Sf	7		mixed-use	12-1bed apt./12-2bed apt./ 5,000sf sit down rest /5,000sf. strip com	88	1 768/21.2 persons in 1bed apt, 2 007/24 1 persons in 2bed apt ,rest(37 4), com(4.8)	81	38	47	42	89
40	CC6	SWX Batavia and Riverview Dr	68,054	B4/R4	10,000 office, 1-2bed and 2-3bed det Sf	19	1-2bed sf (2 7), 2 3bed sf (5 9), office (10)	retail/office	13,800 sf strip com, 3,000 QS rest	36	com (13.3), rest (22 4)	17	-19	-10 5	26.0	16
41																
42	Civic Center Subarea at "Buildout"											536		521	111	632
43																
44	SOUTHWEST DISTRICT SUBAREA															
45	SW1	NWX Rt. 56/Rt. 59	1,088,534	B2/B4/R2	no existing sewer connection	0		mixed use/ commercial	105 room hotel, 9,000 sf. SD rest., 6,000 sf. QS rest., 45,000 sf FS com , 20,000 office, 75,000 warehousing, 75,000 light mfg/assembly	394	hotel(157 5), SD rest. (67 2), QS rest. (38.2), FS com. (44.1), office (20), whs. (25.5), lgt. mfg. (41.3)	394		0	477	477
46	SW2	East side of Rt. 59 South of Ferry Creek	39,384	O1	three existing homes (9 residents) / no sewer connection	0		open space	3-det. sf. homes	9	1 2 bed (2 7 persons), 2-3bed (5 9 persons) sf Homes (9)	9	0	10 5	0	11
47	SW3	Intersection of Prairie/Rt. 59	67,822	O1	no existing sewer connection	0		commercial/open space	8,000 freestanding com., 4,000 QS rest.	33	FS com. (7.8), QS rest. (25 5)	33		0	33	33
48	SW4	NEX Rt 56/Rt. 59	309,312	O1	vacant site	0		commercial	5,000 sit down rest., 40,000 strip commercial	77	SD rest (37.4), strip com. (39.2)	77		0	77	77
49	SW5	South side of Ivan Albright	169,775	R2	three existing homes (8 residents)/no sewer connection	0		townhomes	14-2bed and 14-3bed twnhm	57	1 697/23.8 persons in 2bed, 2 374/33 2 persons in 3bed (9)	57	49	98	0	98
50	SW6	SEX Rt. 59/Ivan Albright	188,320	R2	two existing homes (5 residents) / no sewer connection	0		townhomes	15-2bed and 15-3bed twnhm	61	1 697/25.4 persons in 2bed, 2 374/35 6 persons in 3bed (9)	61	56	105	0	105
51	SW7	Kleinman Property	908,614	B2	vacant site	0		commercial/ multi-fam	5,000 sf QS rest./10,000 sf. Strip com , 38-1bed twnhm/37-2bed twnhm/132-1bed apt/80-2bed apt/4-3bed apt	598	38-2bed twnhm (64.5 persons) /37 3bed twnhm (87.8 persons) /132-1bed apt (233.4 persons) /80-2bed apt (160 6 persons)/4-3bed apt (10 1 persons), QS restorn. (31 8), strip com (9.6)	598	556	713	41	754
52	SW8	Duke Property	392,769	R2	vacant site	0		mixed use/ commercial	20,000 strip com, 20,000 office, 5,000 QS rest/40,000 warehouse	79	Strip com. (19 2), office (20), QS rest. (25.8), warehouse (13 6)	79		0	105	105
53	SW9	City Owned Tortonello Property	45,312	R2	no existing sewer connection	0		open space/large lot sf	3-4bed det. sf	11	3.559/10.6 persons in 4 bed home	11	11	10 5	0	11
54	SW10	Misc Riggi Rd. sf lot	16,000	R2	vacant site	0		open space/large lot sf	1-3bed det sf	3	2.955/3 0 persons per 3 bed home	3	3	3.5	0	4
55	SW11	Burgess Enterprises Property	331,653	O1	vacant site	0		bus Park	20,000 office, 35,000 warehouse, 35,000 light mfg	33	Per City approved PUD plan for Highpoint Project. Office (20), whs(11 9), light mfg (19.3)	33		0	90	90
56	SW12	Gerhendstine Proprty	52,000	R2	vacant site	0		large lot sf	2-4bed det sf	7	3.559/7 1 persons in 4 bed home	7	7	7	0	7
57	SW13	Misc Barclay Av. sf lot	39,600	R2	vacant site	0		large lot sf	2-4bed det sf	7	3 559/7 1 persons in 4 bed home	7	7	7	0	7
58	SW14	Misc. Barclay Av sf lot	40,000	R2	vacant site	0		large lot sf	2-4bed det sf	7	3.559/7 1 persons in 4 bed home	7	7	7	0	7
59	SW15	Stahelin Properties	229,600	R2	vacant site			commercial	3,000 QS rest/7,000 freestanding com	26	QS rest (19.1), FS com (6 9)	26		0	26	26
60	SW16	Goff Property	124,558	R2	two existing homes (2 residents)/ no sewer connection	0		townhomes	10-2bed and 10-3bed twnhm	41	1 697/17.0 persons in 2bed, 2 374/23.7 persons in 3bed (9)	41	39	70	0	70
61	SW17	Moses Property	105,687	M1	existing home (2 residents)/ no sewer connection	0		twnhomes	9-2bed and 9-3bed twnhm	37	1.697/15.3 persons in 2bed, 2.374/21 4 persons in 3bed (9)	37	35	63	0	63

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7					EXISTING				FUTURE / PROJECTED							
8	Site #	Name	Net Site Area (3)	Zoning	Use	PE (1)	Notes	Comp. Plan	Use	PE (1)	Notes (numbers are for Net Res Population Est)	Net PE Increase (1)(5)	Net Res. Pop Inc. (1)(6)	IEPA Residental PE (2)	IEPA Non-Residental PE (2)	IEPA TOTAL PE (2)
62	SW18	Blanchard Alliance Church vacant	73,468	B2	vacant site	0		twnhomes	7-2bed and 6-3bed twnhm	26	1.697/11.9 persons in 2bed, 2 374/14.2 persons in 3bed	26	26	45 5	0	46
63	SW19	Blanchard Alliance Church improved	144,134	B2	no existing sewer connection	0		church	150	8		8		0	8	8
64	SW20	Emmanual Baptist Church	117,560	R2	no existing sewer connection	0		church	186 current/450 future max seat church	23	based on max buildout	23		0	23	23
65	SW21	Wheeler Property	153,557	M1	no existing sewer connection	0		senior housing	80 bed sr. housing facility	100		100		0	100	100
66	SW22	Migs Corp Property	30,000	R2	vacant	0		townhomes	3-2bed and 3-3bed twnhm	12	1.697/5 1 persons in 2bed, 2 374/7 3 persons in 3bed	12	12	21	0	21
67	SW23	Anderson/Gentile/City Prop.	719,360	R2	vacant	0		townhomes	53-2bed and 53-3bed twnhm	216	Per 8/17 approved Prelim. PUD Plan for Lexington Trace. 1.697/90.0 persons in 2bed, 2 374/125.8 persons in 3bed	216	216	371	0	371
68	SW24	NWX Rt. 59/Estes	71,718	R2	existing home (2 residents) / no sewer connection	0		townhomes	7-2bed and 8-3bed twnhm	31	1 697/11.9 persons in 2bed, 2 374/19.0 persons in 3bed	31	29	52 5	0	53
69	SW25	Illinois Youth Home	1,185,501	R2	70 bed youth detention facility	155	Actual last 12 mo ave. water useage is 15,482 gpd	business park	300,000 sf warehouse/50,000 office	152	whs (102), office (50)	-3		0	195	195
70		19 Existing Estes/Braggs det. sf to remain		R2	19 existing homes (56 residents)/ no sewer connections	0		large lot sf		56	8-2bed (2 746/22 0), 8-3bed (2.955/23.6), 3-4bed(3.559/10.7) (4)(5) (6)	56	0	66 5	0	67
71																
72	Total Southwest District Subarea at "Buildout"											1949		1651	1175	2826
73																
74	REMAINING INCORPORATED CITY.															
75	I1	BP Prop. @NWX Herrick/Warrenville Rds	642,253	R1	vacant site	0		office	192,000 office	192		192		0	192	192
76	I2	Franke Prop. West St.	104,986	R1	existing home (4 residents)/no existing sewer connection	0		large lot sf	3-4 bed det sf	11	3.559/10 7 persons per 4bed det sf (6)	11	7	10 5	0	11
77	I3	SWX Galusha/West	40,700	R2	existing home (2 residents)/ no sewer connection	0		med lot sf	1-3bed /1-4bed det sf	7	2.955/3.0 persons per 3bed, 3.559/3 6 persons per 4bed (6)	7	5	7	0	7
78	I4	Herbo Property east	35,702	O1	vacant	0		office	10,000 sf sf	10		10		0	10	10
79	I5	Herbo Property west	74,302	O1	1-2bed det. Sf/1800 storage	5	1-2bed sf (2.7), storage (2.7)	office	20,000 office	20		15		-3.5	19	15
80	I6	Jaeger Property	23,338	B2	vacant site	0		sm Lot sf	1-3bed /2-4bed det. sf	10	1-3bed (2.955/3.0), 2-4bed(3.559/7 1)	10	10	10 5	0	11
81	I7	SEX Winfield/Galusha	39,669	R3	vacant site	0		med lot sf	1-3bed /2-4bed det sf	10	1-3bed (2.955/3.0), 2-4bed(3.559/7 1)	10	10	10 5	0	11
82	I8	Case Property	297,604	R2	no existing sewer connection	0		med lot sf	2-3bed/6-4bed det sf	27	2 3bed (2 955/5.9) 6-4bed (3.559/21.4)	27	27	28	0	28
83	I9	Wheeler/Townline Rd Prop	63,010	R2	vacant site	0		large lot sf	1-5bed det sf	4	1-5bed at 3 645	4	4	3 5	0	4
84	I10	Walker Property	170,750	R2	no existing sewer connection	0		med lot sf	1-3bed /5-4bed det sf	21	1-3bed (2 955/3 0), 5-4bed (3.559/17.8)	21	21	21	0	21
85	I11	Storro Property	345,136	R2	no existing sewer connection	0		med lot sf	3-3bed/7-4bed det sf	34	3-3bed (2 955/8.9), 7-4bed (3.559/24.9)	34	34	35	0	35
86	I12	Miller Prop./Point Oak Drive	61,709	R1A	vacant site	0		large lot sf	1-3bed /2-4bed det sf	10	1-3bed (2 955/3.0), 2-4bed (3.559/7 1)	10	10	11	0	11
87	I13	Sequestria Subdivision	529,967	R1A	vacant site	0		large lot sf	2-3bed/11-4bed det sf	45	2-3bed (2.955/5 9), 11-4bed (3.559/39.1)	45	45	45 5	0	46
88	I14	Aschauer Prop.	107,424	R1A	existing home (2 residents)/no sewer connection	0		large lot sf	1-3bed /2-4bed det sf	10	1 3bed (2 955/3.0), 2-4bed (3.559/7 1)(6)	10	8	10 5	0	11
89	I15	Burke Prop./Batavia Rd.	72,100	R2	existing home (2 residents) / no sewer connection (6)	0		med lot sf	1-3bed/2-4bed det sf	10	1-3bed (2.955/3.0), 2-4bed (3.559/7 1)	10	8	10.5	0	11
90	I16	Bozonelous Lot/Route 59	78,960	B2	vacant site	0		commercial	14,000 freestanding com	14	FS com (14)	14		0	14	14
91	I17	Vacant Lot/N side of Youghall Rd	95,630	M1	vacant site	0		Ind/wrhs	6,000 office/24,000 whse	14	office (6), whse (8.4)	14		0	30	30
92	I18	Four Winds School/N. side of Calumet Av	112,226	M1	vacant site	0		Ind/wrhs	7,000 office/28,000 whse	17	office (7), whse (9.8)	17		0	35	35
93	I19	Redev. site/N. side of Calumet Av	109,353	M1	no existing sewer connection	0		Ind/wrhs	7,000 office/28,000 whse	17	office (7), whse (9.8)	17		0	35	35
94	I20	Care of Trees/N. side of Calumet Av	218,444	M1	no existing sewer connection	0		Ind/wrhs	15,0000 office/60,000 whse	36	office (15), whse (21)	36		0	75	75
95	I21	NEX Talbot/Calumet Av	110,252	M1	vacant site	0		Ind/wrhs	7,000 office/28,000 whse	17	office (7), whse (9.8)	17		0	35	35
96	I22	Assemblage on W. side of Rt 59	192,725	R2	no existing sewer connection	0		office	40,000 office	40		40		0	40	40
97	I23	SW Batavia Rd. Redevelopment	43,636	R3	no existing sewer connection	0		med lot sf	1-3bed/3-4bed det sf	14	1-3bed (2 955/3.0), 3-4bed (3.559/10.7)	14	14	14	0	14
98	I24	NW Batavia Rd Redevelopment	46,388	R4	no existing sewer connection	0		sm lot sf	2-3bed/ 2-4bed det sf	13	2-3bed (2 955/5 9), 2-4bed (3 559/7 1)	13	13	14	0	14

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
7			EXISTING					FUTURE / PROJECTED								
8	Site #	Name	Net Site Area (3)	Zoning	Use	PE (1)	Notes	Comp Plan	Use	PE (1)	Notes (numbers are for Net Res Population Est)	Net PE Increase (1)(5)	Net Res. Pop Inc (1)(6)	IEPA Residental PE (2)	IEPA Non-Residential PE (2)	IEPA TOTAL PE (2)
99	J25	Schille Property/Ferry Road	256,803	M1	1-4bed det. Sf home, 12,000 storage	22	1-bed sf (3 6), storage (18 2)	office	75,000 sf office	75		53		-3.5	57	53
100	Hrrk. Wds.	10-2 Bed Duplex Units		R1A		0		office	duplex	17	10-2bed (1 697/17.0)	17	17	35	0	35
101	Hrrk Wds	10-3 Bed Duplex Units		R1A		0		office	duplex	24	10-3bed (2 374/23 7)	24	24	35	0	35
102	Misc vac. Lots	20-3 Bed Detached SF Homes		Misc		0		med lot sf	mis det. sf	59	20-3bed (2 955/59 1)	59	59	70	0	70
103	Misc vac. Lots	40-3 Bed Detached SF Homes		Misc		0		med. lot sf	mis det sf	142	40-4bed (3 559/142 4)	142	142	140	0	140
104	Misc. vac Lots	15-5 Bed Detached SF Homes		Misc		0		med. lot sf	mis det sf	55	15-5bed (3.645/54 7)	55	55	52.5	0	53
105																
106	**Total Remaining Incorporated City at "Buildout"**											**948**		**557**	**541**	**1098**
107																
108	LIKELY CITY ANNEXATIONS															
109	U1	15 existing Albright/Patterman det SF	n/a	DuPage		0		med lot sf		41	6-2bed (2 746/16 5), 6-3bed (2,955/17.7), 2-4bed(3,559/7 1)	41	41	49	0	49
110	U2	Albright Townhome Redev	211,261	DuPage		0		townhome	16-2bed and 16-3bed twnhm	65	1 697/27 2 persons in 2bed, 2.374/38.0 persons in 3bed	65	65	112	0	112
111	U3	3 existing S. Side Rt 56 det SF	62,376	DuPage		0		med lot sf		65	8-2bed (2 746/22.0), 8-3bed (2,955/23.6), 3-4bed(3,559/10.7)	65	65	66 5	0	67
112	U4	W. Side of Home Av. Townhome Redev	205,782	DuPage		0		townhome	16-2bed and 16-3bed twnhm	65	1.697/27.2 persons in 2bed, 2.374/38.0 persons in 3bed	65	65	112	0	112
113	U5	6 existing Home/Prairie det SF	n/a	DuPage		0		sm lot sf		24	3-2bed (2 746/8 2), 3-3bed (2 955/8.8), 2-4bed(3,559/7.1)	24	24	28	0	28
114	U6	Galusha Farm	430,390	DuPage		0		large lot sf	10-4bed det sf	36	10-4bed (3.599/36.0)	36	36	35	0	35
115																
116	**Total Likely City Annexations at "buildout"**											**296**		**403**	**0**	**403**
117																
118	UNLIKELY CITY ANNEXATIONS															
119		N side of Galusha, w. side of Herrick, Cove Lane	n/a	DuPage				large lot sf	28 - 4 bed det sf	100	28-4bed (3.599/100)	100	100	98	0	98
120		W. side of Williams, S side of Forestview Dr N	n/a	DuPage				large lot sf	12 - 4bed det. sf	43	12-4bed (3.599/43)	43	43	42	0	42
121		Old Farm Lane	n/a	DuPage				large lot sf	10 - 4bed det. sf	36	10-4bed (3.599/36)	36	36	35	0	35
122		Lost Meadows Lane	n/a	DuPage				large lot sf	16 - 4bed det. sf	58	16-4bed (3 599/58)	58	58	56	0	56
123		Morris Ct /Forest Lane	n/a	DuPage				large lot sf	19 - 4bed det. sf	68	19-4bed (3.599/68)	68	68	66.5	0	67
124		Oak Lane	n/a	DuPage				large lot sf	17 - 4bed det. sf	61	17-4bed (3.599/61)	61	61	59.5	0	60
125		Renouf Drive	n/a	DuPage				large lot sf	8 - 4bed det. sf	29	8-4bed (3.599/29)	29	29	28	0	28
126																
127	**Total Unlikely City Annexations at "buildout"**											**395**		**385**	**0**	**385**
128																
129																
130	**Landon Avenue Sanitary Sewer Permit Tributary Area**											1519		1801	303	2104
131																
132	**Southwest District**											**2245**		**2053**	**1175**	**3228**
133	**Cantera**											**2514**		**1528**	**1208**	**2736**
134	**Warrenville (w/o SW District or Cantera)**											**2000**		**1560**	**730**	**2290**
135																
136	**TOTAL CITY "BUILDOUT"**											**6759**	**3855**	**5140**	**3114**	**8254**
137											check	6759				
138		Footnotes and Assumptions														
139		(1) Residential population generation estimates based on Warrenville/Naperville School,Park, and Library Contributions Population Generation Table (Appendix 5)														
140		(2) PE estimate based on Table No 1 -Residential Occupancy Criteria from Title 35, Subtitle C, Chapter II, Part 370, Section 370 Appendix A of the Illinos Administrative Code														
141		(3) Net development site is total site area minus all 100 yr. floodplain/wetland areas														
142		(4) Bedroom breakdown % per 2015 American Communities Survey data (Appendix 4)														
143		(5) PE for existing homes in SW District (row 70) is accounted for in the TAB 3 Estimated Additional PE From Existing Incorporated Residential Served by Private Septic spreadsheet														
144		(6) Population increase adjusted to account for existing residents on site (Appendix 7)														
145		Assumed townhouse net development site density in Old Town/Civic Center Subarea = 9 d.u./ac which is higher than any other townhouse project developed in the City in the past 25 years														
146		Assumed townhouse net development site density for sites in Southwest District without specific pending development proposal = 7 d.u./ac.														

TABLE OF ESTIMATED ULTIMATE POPULATION PER DWELLING UNIT

Type Of Unit	Preschool 0 - 4 Yrs.	Elementary Grades K - 5 5 - 10 Yrs.	Middle Grades 6 - 8 11 - 13 Yrs.	Total Grades K - 8 5 - 13 Yrs.	High School Grades 9 - 12 14 - 17 Yrs.	Adult 18 Yrs. +	Total Per Dwelling Unit
Detached single-family:							
2 bedroom	0.120	0.411	0.138	0.549	0.222	1.856	2.746
3 bedroom	0.268	0.486	0.153	0.639	0.135	1.913	2.955
4 bedroom	0.371	0.702	0.259	0.961	0 242	1.985	3.559
5 bedroom	0.386	0.590	0.236	0 826	0.242	2.191	3.645
Attached single-family:							
2 bedroom	0.206	0.084	0.057	0.141	0.030	1.318	1.697
3 bedroom	0.214	0.104	0.039	0.143	0.050	1.966	2 374
4 bedroom	0.183	0.271	0.106	0.377	0.105	2.102	2.767
5 bedroom[1]	--	--	--	--	--	--	--
Apartments:							
Efficiency[1]	--	--	--	--	--	1.400	1.400
1 bedroom	0.058	0.032	0.012	0.044	0.013	1.653	1.768
2 bedroom	0.129	0.064	0.031	0.095	0.038	1.744	2.007
3 bedroom	0 199	0.115	0.073	0.188	0.083	2.055	2.525

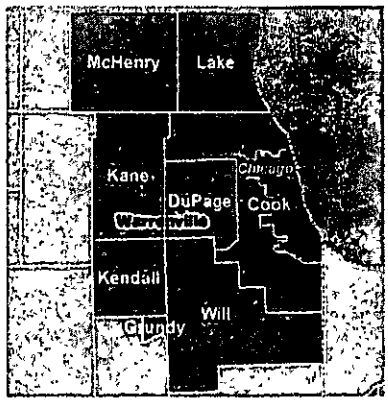
Note:
1. No yield data were generated due to lack of population or no (or very few) residential

APPENDIX 3

APPENDIX 4

MetroPulse

Community Data Snapshot | Warrenville



GENERAL POPULATION CHARACTERISTICS, 2015

	Community	DuPage County**	CMAP Region
Total Population	13,373	930,412	8,505,977
Total Households	4,904	338,083	3,067,594
Average Household Size	2.7	2.7	2.7
Population Change, 2000-10	-1.7%	1.4%	3.5%
Median Age*	38.0	38.8	36.5

Source: 2000 and 2010 Census, 2015 American Community Survey five-year estimates

*Note that all Regional Medians were calculated based on Grouped Frequency Distributions.
**For municipalities located in more than one county, data provided is for the county containing the largest portion of the municipality

RACE AND ETHNICITY, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
White	9,124	68.2	638,010	68.6	4,437,089	52.2
Hispanic or Latino*	2,653	19.8	129,549	13.9	1,902,685	22.4
Black	529	4.0	42,526	4.6	1,443,074	17.0
Asian	491	3.7	100,181	10.8	564,622	6.6
Other	576	4.3	20,146	2.2	158,507	1.9

Source: 2015 American Community Survey, five-year estimates. Universe Total population. *Includes Hispanic or Latino residents of any race

AGE COHORTS, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
19 and under	3,544	26.5	245,897	26.4	2,271,714	26.7
20 to 34	2,597	19.4	175,819	18.9	1,810,122	21.3
35 to 49	3,124	23.4	190,925	20.5	1,757,378	20.7
50 to 64	2,887	21.6	197,408	21.2	1,623,940	19.1
65 to 79	969	7.2	88,262	9.5	763,055	9.0
80 and Older	252	1.9	32,101	3.5	279,768	3.3

Source 2015 American Community Survey five-year estimates Universe Total population

HOUSEHOLD INCOME, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
Less than $25,000	520	10.6	42,209	12.5	611,519	19.9
$25,000 to $49,999	860	17.5	61,051	18.1	628,579	20.5
$50,000 to $74,999	1,060	21.6	56,810	16.8	525,203	17.1
$75,000 to $99,999	798	16.3	47,261	14.0	390,982	12.7
$100,000 to $149,999	1,045	21.3	62,654	18.5	469,634	15.3
$150,000 and Over	621	12.7	68,098	20.1	441,677	14.4
Median Income	$75,517		$79,658		$63,441	

Source 2015 American Community Survey five-year estimates Universe. Total households.

EDUCATIONAL ATTAINMENT, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
High School Diploma or Higher	8,120	91.5	579,645	92.4	4,930,208	87.0
Bachelor's Degree or Higher	3,793	42.8	293,166	46.7	2,095,647	37.0

Source: 2015 American Community Survey five-year estimates Universe Population 25 and older.

Community Data Snapshot: Warrenville - Page Two

HOUSING AND TENURE, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
Occupied Housing Units	4,904	**93.4**	338,083	**94.7**	3,067,594	**90.9**
Owner-Occupied	3,973	81.0	248,508	73.5	1,964,992	64.1
Renter-Occupied	931	19.0	89,575	26.5	1,102,602	35.9
Vacant Housing Units	349	**6.6**	18,933	**5.3**	307,518	**9.1**

Source. 2015 American Community Survey five-year estimates Universe Total housing units

HOUSING TYPE, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
Single Family, Detached	2,753	52.5	213,557	60.0	1,687,381	50.4
Single Family, Attached	1,468	28.0	43,691	12.3	255,569	7.6
2 Units	37	0.7	2,441	0.7	237,396	7.1
3 or 4 Units	351	6.7	11,585	3.3	281,795	8.4
5 or more Units	637	12.1	84,942	23.8	886,515	26.5

Source· 2015 American Community Survey five-year estimates Universe Total housing units excluding mobile, boat, RV, van, etc.

HOUSING SIZE, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
0 to 1 Bedrooms	171	3.3	42,816	12.0	546,567	16.2
2 Bedrooms	1,993	37.9	88,113	24.7	968,317	28.7
3 Bedrooms	2,080	39.6	119,867	33.6	1,132,344	33.5
4 Bedrooms	845	16.1	86,014	24.1	573,487	17.0
5+ Bedrooms	164	3.1	20,206	5.7	154,397	4.6
Median Number of Rooms*		**5.9**		**6.2**		**6.0**

Source 2015 American Community Survey five-year estimates. Universe: Total housing units *Includes all rooms

HOUSING AGE, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
Built 2000 or Later	262	5.0	33,997	9.5	415,030	12.3
Built 1970 to 1999	3,896	74.2	205,817	57.6	1,134,825	33.6
Built 1940 to 1969	778	14.8	96,630	27.1	1,049,851	31.1
Built Before 1940	317	6.0	20,572	5.8	775,406	23.0
Median Year Built		1978		1977		1967

Source 2015 American Community Survey five-year estimates Universe· Total housing units

HOUSING & TRANSPORTATION (H+T)* COSTS, PERCENT OF INCOME PER HOUSEHOLD

	Median-Income Family	Low-Income Single-Parent Family	Moderate-Income Retired Couple	Moderate-Income Family
Housing Costs	30.4	49.8	38.8	36.9
Transportation Costs	21 1	29.7	11.9	20.1
H + T Costs	51.5	79.4	50.7	57.0

Source. Location Affordability Index, U S. Dept. of Transportation and U.S. Dept of Housing and Urban Development

*The purpose of the H+T Index is to isolate the effect of location on housing and transportation costs, grouped by common demographic characteristics that form four distinct household types The values above represent the percent of household income that an average household within each of these types in the region would spend on housing and transportation if they lived in this county. The standard threshold of affordability is equal to 30 percent for housing costs and 45 percent for housing and transportation costs combined For more information, visit www locationaffordability.info/About_Data aspx.

Community Data Snapshot: Warrenville - Page Three

EMPLOYMENT STATUS, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
In Labor Force	8,247	**77.4**	516,237	**70.1**	4,530,902	**67.6**
Employed*	7,554	91.6	479,592	92.9	4,089,665	90.3
Unemployed	693	8.4	36,311	7.0	428,995	9.5
Not In Labor Force	2,408	**22.6**	220,567	**29.9**	2,168,191	**32.4**

Source: 2015 American Community Survey five-year estimates Universe: Population aged 16 and over.

*Does not include employed population in the Armed Forces

PRIVATE SECTOR EMPLOYMENT, 2015*

	Community		DuPage County		Six-County Region**	
	Count	Percent	Count	Percent	Count	Percent
Private Employment	N/A	N/A	544,363	N/A	3,433,003	N/A
Job Change (2005-15)	N/A	N/A	24,522	4.7	99,623	3.0
Private Sector Jobs per HH	N/A		1.61		1.13	

Source: Illinois Department of Employment Security (IDES) *Figures exclude employees not covered by unemployment insurance

**Kendall County is not included in IDES data

EMPLOYMENT OF COMMUNITY RESIDENTS, 2014

By Industry Sector	Count	Percent
Health Care	747	12.1
Professional	652	10.6
Manufacturing	578	9.4
Retail Trade	541	8.8
Education	538	8.7

EMPLOYMENT IN THE COMMUNITY, 2014

By Industry Sector	Count	Percent
Professional	1,580	19.4
Wholesale Trade	1,225	15.1
Management	849	10.4
Accommodation and Food	699	8.6
Health Care	646	7.9

By Employment Location			*By Residence Location*		
Naperville	572	9.3	**Chicago**	714	8.8
Wheaton	485	7.9	**Naperville**	713	8.8
Chicago	470	7.6	**Aurora**	681	8.4
Aurora	296	4.8	**Warrenville**	293	3.6
Warrenville	293	4.8	**Wheaton**	199	2.4

Source: U.S Census Bureau, Longitudinal-Employer Household Dynamics Program.

MODE OF TRAVEL TO WORK, 2015

	Community		DuPage County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
*Work at Home**	360	N/A	24,244	N/A	183,368	N/A
Drive Alone	5,833	82.1	367,120	82.3	2,783,650	72.6
Carpool	808	11.4	35,595	8.0	333,064	8.7
Transit	214	3.0	30,269	6.8	515,377	13.4
Walk or Bike	179	2.5	9,518	2.1	160,132	4.2
Other	70	1.0	3,802	0.9	43,951	1.1
TOTAL COMMUTERS	7,104	**100.0**	446,304	**100.0**	3,836,174	**100.0**

Source: 2015 American Community Survey five-year estimates *Not included in "total commuters"

ANNUAL VEHICLE MILES TRAVELED (VMT) PER HOUSEHOLD, 2015*

	Community	DuPage County	CMAP Region
Average Vehicle Miles Traveled	22,092	21,800	16,723

Source. CMAP analysis of US Census Bureau, HERE, Illinois Environmental Protection Agency and Illinois Secretary of State data.

*Estimates are made from input data from 2013-2016

Community Data Snapshot: Warrenville - Page Four

GENERAL MERCHANDISE RETAIL SALES, 2016

	Community	DuPage County	CMAP Region
Total Retail Sales*	$220,695,320	$20,274,952,381	$125,192,928,993
Total Sales per Capita**	$16,503	$21,791	$14,718

Source: Illinois Department of Revenue

*Does not include qualifying food, drugs, and medical appliances.
**Per capita calculations based on population from 2015 ACS 5-year estimates

EQUALIZED ASSESSED VALUE, 2015

Residential	**$247,203,723**
Commercial	**$145,236,122**
Industrial	**$12,828,513**
Railroad	**$0**
Farm	**$21,639**
Mineral	**$0**
TOTAL	**$405,289,997**

Source: Illinois Department of Revenue

OPEN SPACE AND WALK SCORE

	Open Space Acreage per 1,000 Residents
Community	**33.1**
DuPage County	**45.0**
Region	**39.8**
Walk Score*	**N/A**

Source: CMAP calculations of 2013 Land Use Inventory, walkscore.com.
*Walk Score is a number between 0 and 100 that measures the average walkability of a municipality

GENERAL LAND USE, 2013

	Acres	Percent
Single-Family Residential	1,431.0	40.1
Multi-Family Residential	69.0	1.9
Commercial	460.4	12.9
Industrial	45.8	1.3
Institutional	157.5	4.4
Mixed Use	N/A	N/A
Transportation and Other	681.2	19.1
Agricultural	87.2	2.4
Open Space	442.9	12.4
Vacant	194.9	5.5
TOTAL	**3,569.8**	**100.0**

Source: Chicago Metropolitan Agency for Planning Parcel-Based Land Use Inventory.

For More Information

Please direct inquiries to Jon Hallas, 312-386-8764 or JHallas@cmap.illinois.gov. To access other Community Data Snapshots for municipalities and counties in the Chicago Metropolitan Agency for Planning's seven-county northeastern Illinois region, visit www.cmap.illinois.gov/data/metropulse/.

Chicago Metropolitan Agency for Planning

THE CHICAGO COMMUNITY TRUST AND AFFILIATES

Last updated June 2017

Appendix 5

Estimated Additional PE From Existing Incorporated Residential Served by Private Septic

Created by: R: Mentzer

Last Updated: 2/8/18

A. Estimated Total Number of Existing Housing Units in City of Warrenville NOT Served with City Sanitary Sewers

	5,253	Total housing units in City of Warrenville (1)
-	637	Total multi-family/apartment housing units in City of Warrenville (1)
	4,616	Total non multi-family/apartment housing units in City of Warrenville
-	4,145	Total non-mulit family/apartment residential City sanitary sewer accounts (2)
	471	**Total # of existing housing units in City of Warrenville without City sanitary sewer service (3)**

B. Estimated Population Equivalent Associated with Existing Housing Units (HU) Not Served with City Sanitary Sewers

Unit Type	Bedroom Breakdown % (4)	Total HU on Septic	Estimated Bedroom Breakdown	Population Estimate Per Unit (5)	Population Estimate by Unit Type
1-bed	0.033		16	2.746	42.7
2-bed	0.379		179	2.746	490.2
3-bed	0.396	471	187	2.955	551.2
4-bed	0.161		76	3.599	272.9
5-bed	0.031		15	3.645	53.2
TOTAL EST. EXISTING CITY OF WARRENVILLE POPULATION NOT CONNECTED TO CITY SANITARY SEWER SERVICE					**1410**

BASED ON TITLE 35: 471 x 3.5 = **1648.5 PE**

Assumptions and data sources:

(1) Per 2015 American Communities Survey (ACS) data

(2) Per City of Warrenville Utility Billing 8/17

(3) There are no attached single family homes or apartments located within the City of Warrenville that are serviced by a private septic system. Therefore, all housing units within the City of Warrenville that are not connected to the City's Sanitary Sewer System are assumed to be detached single family homes.

(4) Percentage breakdown of different housing size/bedroom as reflected in 2015 ACS data for City of Warrenville

(5) Population generation estimates for different size homes as provided in Naperville and Warrenville land/cash dontion ordinance

APPENDIX 5

APPENDIX 6: Land Use to Population Equivalents

prepared by Sr. Civil Engineer Kristine Hocking, last updated 1/30/18

100

USAGE	UNIT	AWWA Category	AWWW GPD	ILLINOIS TITLE 35 (GPD per UNIT)	PE/UNIT (Using 1 PE = 100 GPD)
Multi-Tenant Commercial Strip	LEASABLE SQUARE FOOT	NA	NA	0.100	**0.00100**
Free-standing Retailer	LEASABLE SQUARE FOOT	NA	NA	0.100	**0.00100**
Sit down/dine-in restaurant with bar	LEASABLE SQUARE FOOT	Restaurants	0.7470	NA	**0.00747**
Quick serve restaurant	LEASABLE SQUARE FOOT	Fast food restaurant	0.6369	NA	**0.00637**
Business Park Mixed Use	LEASABLE SQUARE FOOT	NA	NA	0.100	**0.00100**
Business Park Mixed Use	LEASABLE SQUARE FOOT	NA	NA	0.100	**0.00100**
Senior Housing	PER BED	NA	NA	125	**1.25000**
Hotel/Motel	PER ROOM	NA	NA	150	**1.50000**
State of Illinois Youth Detention	PER BED	NA	NA	200	**2.00000**
Church	PER SEAT	NA	NA	5	**0.05000**
Light Manufacturing	LEASABLE SQUARE FOOT	NA	NA	0.100	**0.00100**
Warehouse, Distribution	LEASABLE SQUARE FOOT	NA	NA	0.100	**0.00100**
Other Industrial	LEASABLE SQUARE FOOT	NA	NA	0.100	**0.00100**
Efficiency or Studio Apartment	PER UNIT	NA	NA	1	**1.00000**
1 Bedroom Apartment	PER UNIT	NA	NA	1.5	**1.50000**
2 Bedroom Apartment	PER UNIT	NA	NA	3	**3.00000**
3 Bedroom Apartment	PER UNIT	NA	NA	3	**3.00000**
Single Family Dwelling	PER UNIT	NA	NA	3.5	**3.50000**

APPENDIX 6

Total Buildout Flow Analysis Table using IEPA Values in Appendix 2

1. Condition	2. Existing Conditions City of Warrenville*	3 Existing Conditions Cantera**	4. Total Existing Flow	5. Buildout Conditions Landon Avenue Permit Only***	6. Buildout Conditions Southwest District***	7. Buildout Conditions Cantera***	8. Buildout Conditions Rest of City (w/o SW District or Cantera)***	9. Total Existing Flow plus Landon Avenue Permit Buildout***	10. Total Ultimate Buildout***	11. City of Warrenville Maximum Allowable Flows under Agreement and Ammendments at Current Capacity (from Naperville June 23,2017 Letter Table 1)	12.City of Warrenville Maximum Allowable Flows under Agreement and Ammendments at Ultimate Capacity (from Naperville June 23,2017 Letter Table 1)
								Col 4 + Col 5	Col 4 + Col 6 + Col 7+ Col 8		
Average Daily Flow (MGD)	1.55	0.23	1.78	0.21	0.32	0.27	0.23	**1.99**	**2.61**	2.50	2.74
Average Day Flow of the 3-Low Flow Months of the Previous 12 Months	1 20	0.21	1.41	0.16	0.25	0.21	0.18	**1.99**	**2.02**	1.94	2.12
Peak Day Flow limited to less than 250% of Average Day Flow of the 3-Low Flow Months of the Previous 12 Months	3.00	0.53	3.53	0.41	0.62	0.53	0.44	**4.98**	**5.04**	4.84	5.30
Peak Hour Flow limited to less than 400% of Average Day Flow of the 3-Low Flow Months of the Previous 12 Months	4.80	0.84	5.64	0.65	1.00	0.85	0.71	**7.96**	**8.07**	7.74	8.49

*Actual Flows from the Ferry Road Metering Site (2016-2017) (Provided by City of Naperville)

**Uses Actual 2015 Data Cantera Metering Site (Provided by City of Naperville)

***Using ratio between 3-Low Flow Month Average Day Flow to Average Day Flow for previous 12 months. This will fluctuate. Uses Appendix 4 PE Value 0.774

Last Updated 2/8/2018

EXHIBIT 2

EXHIBIT 3

S|D|I
CONSULTANTS LTD.

WASTEWATER STUDY

FOR

ELMHURST-CHICAGO STONE COMPANY

WARRENVILLE QUARRY DEVELOPMENT

Warrenville, Illinois

WASTEWATER STUDY

for

ELMHURST-CHICAGO STONE COMPANY

WARRENVILLE QUARRY DEVELOPMENT

Warrenville, Illinois

An Analysis of the
Wastewater Conveyance
and Treatment System
Serving the
City of Warrenville

Prepared By:
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October 12, 1990

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EXECUTIVE SUMMARY

This study provides an analysis of the impact of development of the Elmhurst-Chicago Stone Quarry (ECSQ) site in Warrenville on the wastewater conveyance and treatment system of the City of Naperville. The City of Naperville conveys and treats wastewater from the City of Warrenville under an existing intergovernmental agreement between the municipalities. Warrenville's wastewater is transported to the Springbrook Regional Water Reclamation Center by an interceptor sewer system owned and operated by Naperville. This interceptor sewer system, comprised of 27", 36" and 42" diameter trunk sewers and two pumping stations, has a finite flow capacity which, if significantly exceeded, could result in sewer backups in Naperville.

Accordingly, this study was undertaken to gather data on existing wastewater flows and to project future flows from the Elmhurst-Chicago Stone Quarry development as well as the total service area tributary to the interceptor sewer system. Future flows were computed by two different methods. First, "anticipated-actual" flows, which include daily dry weather, daily wet weather and peak hourly flows, were projected based upon past historical peaking factors and full development of the service area. Second, "theoretical-maximum" flows were developed based upon the wet weather peaking factors permitted under the intergovernmental agreement and application of these factors to wastewater flows generated by a fully developed service area.

The results of the study indicate that if future wastewater flows do not exceed the "anticipated-actual" wastewater flows, the interceptor system will have sufficient capacity to accommodate full development of the remaining unbuilt areas in Naperville, Warrenville, and the ECSQ site without adding capacity to the interceptor system. If future wastewater flows exceed those flows

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which can reasonably be anticipated and approach the theoretical maximum rates permitted under the intergovernmental agreement, then the capacity of the existing interceptor sewer system may be exceeded and peak flows may have to be attenuated to avoid potentially unacceptable surcharges in the system.

Peak flows can be attenuated through the construction of a holding basin on the ECSQ site. This holding basin would detain wastewater flow from the quarry development for the period of time during which peak flows exceed the capacity of the interceptor sewer system. The detained flows would then be released during non-peak wastewater flow periods.

Since the capacity of the interceptor system may not be exceeded, a holding basin should not be constructed at the onset of quarry development; however, an area for a holding basin should be reserved in the land plan for the quarry development. The design and construction of this basin should be deferred until such time as the flow rates in the interceptor sewer system exceed the capacity of the system.

With respect to the ECSQ site, the current development uses and densities generate an estimated daily dry weather wastewater flow of 1,000,000 gallons. This flow rate may increase or decrease slightly depending on the actual development constructed on the quarry site but for purposes of amending the intergovernmental agreement this flow rate represents a reasonable estimation of wastewater flow.

I. INTRODUCTION

This study has been undertaken to analyze the impact of development of the Elmhurst-Chicago Stone Company's Warrenville Quarry on the surrounding municipal wastewater conveyance and treatment systems. The Elmhurst-Chicago Stone Quarry (ECSQ) is a 650 acre tract of land bounded by Mill Street on the east, Diehl Road Commons on the south, the West Branch of the DuPage River on the west, and Warrenville Road on the north. It is bisected by the East-West Tollway (I-88) and is wholly contained within the corporate limits of the City of Warrenville.

Multi-use development is planned for the property including residential, office, business park (office/warehouse), retail and hotel uses. Three new county roadways will be extended through the property: 1) Diehl Road (east-west) from River Road to Mill Street; 2) Ferry Road (east-west) from River Road to Mill Street; and 3) Winfield Road (north-south) from Warrenville Road to Diehl Road. A diamond interchange is planned at the Winfield Road/East-West Tollway Intersection. Public utilities, including water distribution, sanitary sewer and stormwater collection, natural gas, electric and telephone systems, will be installed as part of the overall site infrastructure improvements to prepare the property for development.

This study specifically analyzes the impact of wastewater flow from the developed ECSQ property on the surrounding wastewater collection and treatment facilities.

II. REPORT OBJECTIVES

The ECSQ property, along with the remainder of the City of Warrenville, is located within the Facilities Planning Area (FPA) of the Springbrook Regional Water Reclamation Center which is owned and operated by the City of Naperville. The City of Warrenville does not own a municipal wastewater treatment facility. The absence of a municipal treatment plant in Warrenville results from the fact that until the early 1970's Warrenville's sewage had been collected and treated by a private utility company, the Westview Utility Company. In the early 1970's, Warrenville bought, and then sold, this system to Naperville. Naperville abandoned the treatment plant serving Warrenville and constructed an interceptor sewer system and the Springbrook regional treatment plant to accommodate wastewater flows originating within the Springbrook FPA.

An intergovernmental agreement was established between the City of Naperville and the City of Warrenville on August 5, 1982 and amended on December 18, 1984. The basic agreement provided for the conveyance and treatment of Warrenville's wastewater by the City of Naperville. It guaranteed to Warrenville an interceptor sewer capacity of 17,400 P.E. (1.74 MGD) daily dry weather flow. The 1984 amendment modified and updated the method for computing treatment and conveyance costs but left all other elements of the 1982 agreement intact. The agreement permitted daily wet weather flows up to 250 percent of the average daily dry weather flow, the latter to be calculated as the average of the lowest three flow months of the previous twelve months. Peak hourly wet weather flow rates were limited to 400 percent of the average daily dry weather flow rate, the latter to be calculated as the

average of the lowest three flow months of the previous twelve months.

At the direction of the Northeastern Illinois Planning Commission (NIPC), that portion of Naperville's interceptor sewer system serving Warrenville was designed and constructed with the ECSQ site specifically excluded from the computation of the design capacity of Naperville's interceptor sewers. NIPC took this position when the interceptor sewers were being planned in 1972 in response to their expectation that the ECSQ property would not be developed for at least 50 years. As development in northeastern Illinois accelerated over the past twenty years, this position has proven to be inappropriate.

The ECSQ property is located in one of the fastest growing corridors in DuPage County. In recent years, the City of Warrenville and the Elmhurst-Chicago Stone Company have been seriously analyzing a number of development programs for the site with densities ranging from approximately nine (9) to fourteen (14) million square feet. Inasmuch as wastewater flows generated by development of the ECSQ site were not included in the original intergovernmental agreement between Naperville and Warrenville, it is necessary to again amend the intergovernmental agreement to make provisions for the additional wastewater flow from the City of Warrenville to include the ECSQ property.

To facilitate the amendment process, Naperville has requested a thorough technical analysis identifying the impact to their interceptor sewer system from the development of the ECSQ site. This analysis must include projected ECSQ flows as well as current and future flows from the remaining portion of the FPA within Naperville to determine if Naperville's interceptor sewer system has sufficient capacity for the added flows.

The objectives of this report are: 1) to determine current and future flows generated by the tributary areas of the interceptor sewer system within the City of Warrenville, the City of Naperville and the ECSQ site; 2) to evaluate the available capacity in that portion of Naperville's interceptor sewer system serving the City of Warrenville; 3) to compare the available capacity of the interceptor system and the Springbrook Treatment plant with projected average daily dry weather, daily wet weather and peak hourly wet weather flow rates; 4) to identify potential areas of capacity limitations and set forth solutions whereby those flows which exceed the interceptor system capacity can be attenuated.

III. BACKGROUND

In 1989, as part of an analysis to determine the development potential of the ECSQ property, SDI Consultants evaluated three options available for treatment of wastewater originating from the ECSQ property. These options included the utilization of a land treatment system, a packaged treatment plant and connection to the Naperville wastewater system. From this analysis it was concluded that connection to Naperville's system was the preferred option given the existing intergovernmental agreement between the municipalities and Naperville's advanced wastewater treatment facilities.

To obtain information on Naperville's interceptor sewer system and treatment plant, Mr. Allan Poole, Director of the Water and Wastewater Utility Department of the City of Naperville was contacted. Mr. Poole provided physical information on existing interceptor sewers, treatment plant capacity, historical flow data for that portion of Naperville's interceptor sewer system serving Warrenville and future additional flows resulting from development within Naperville.

To obtain information on Warrenville's local sewer system, Mr. Dennis Posluszny, Director of Public Works for Warrenville and Mr. Kenneth Carmignani of James J. Benes & Associates, Warrenville's engineering consultant were contacted. Messrs. Posluszny and Carmignani provided SDI with data on Warrenville's local sewer system and flow data for the past twelve months as measured at the Warrenville Flow Measurement Station.

Finally, with respect to development of the ECSQ site, dry weather and peak flows were projected based upon a range of

probable development plans for the property. The results of this investigation and the projection of flow data are presented in the following sections of this report.

IV. WARRENVILLE SYSTEM DATA

A. Existing Sewer System

The City of Warrenville owns and maintains its own sanitary sewage collection system. This system is relatively new inasmuchas the oldest portions of the system were installed in the mid-1960's. Since 1973, the system has been expanded to provide sewer service to approximately 3500 customers within the service area of the City of Warrenville. Approximately two-thirds of the customers are served by local sewers which are less than 6 years old.

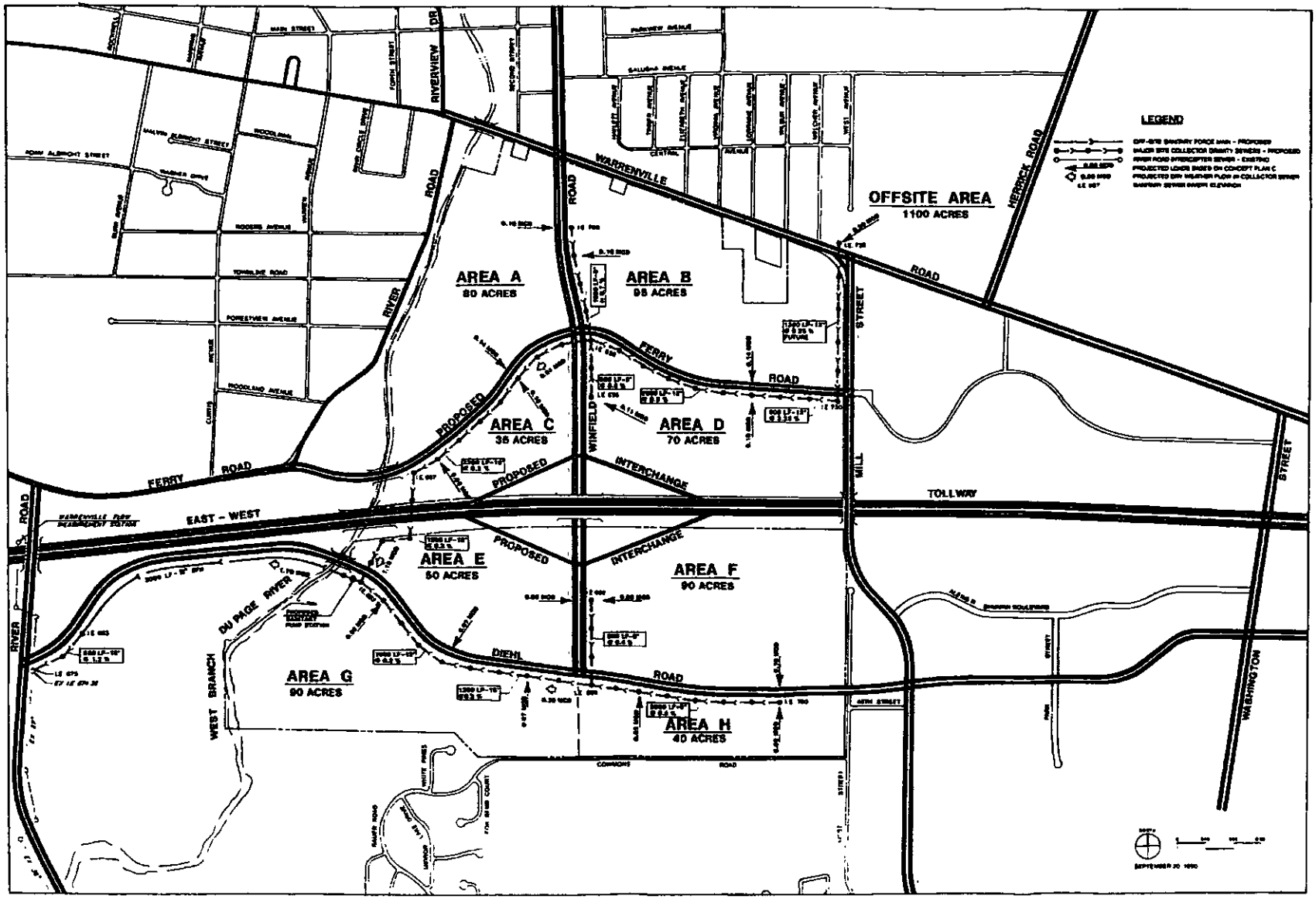
The Warrenville local and collector sewer system conveys sanitary sewage to a flow measurement station located immediately north of I-88, west of River Road and south of Ferry Road. At this point, wastewater is discharged into Naperville's 27" diameter interceptor sewer known as the River Road Interceptor Sewer. The flow measurement station at the discharge point from Warrenville's sewer collection system to Naperville's interceptor sewer system is known as the Warrenville Flow Measurement Station (WMS). This station, owned by Naperville, is a permanent and automated flow measurement device and is manufactured, monitored and maintained by ADS Service, Inc. This state-of-the-art station records both depth and velocity of flow at regular time intervals throughout the day. The data is continuously stored and then retrieved and plotted on a graph of flow rate versus time of day. This data permits the computation not only of total flow but also of peak flow rates throughout the day, week, month or year. (See Appendix A)

The intergovernmental agreement between Naperville and Warrenville referenced hereinbefore provides for the measurement of wastewater flow by Naperville at this station. Monthly billings are prepared based upon the documentation of flow obtained from the Warrenville Measurement Station. The City of Warrenville periodically and independently checks the results of wastewater flow billed by Naperville to Warrenville by means of a McBierney Flow-Tote measuring device. Warrenville's periodic confirmation efforts have generally found daily flows to be within 4% and monthly flows within 2% of the amount billed by Naperville.

B. Proposed ECSQ Sewer System

Development of the ECSQ site will include construction of a sanitary sewer collector system. The major components of this system will be constructed parallel to the public roadways referenced in the introduction to this report. A preliminary layout for the ECSQ sanitary sewer system is based upon anticipated land uses and total wastewater flow and is shown on Exhibit 1. The proposed grading for the site will permit construction of a sewer system which will serve all areas of the ECSQ site by gravity. This gravity system will collect and convey wastewater to a new pump station located adjacent to the Diehl Road crossing of the West Branch of the DuPage River. This pump station will discharge wastewater through a 12" force main which extends west along Diehl Road to the 27" diameter River Road Interceptor Sewer.

The ECSQ collection system, when constructed in accordance with IEPA and City of Warrenville standards, should experience wet weather flows with peaking factors significantly below the peak flow factors currently



ELMHURST CHICAGO STONE PROPERTY

WARRENVILLE QUARRY SITE

PRELIMINARY WASTEWATER COLLECTION SYSTEM

EXHIBIT 1

associated with Warrenville's existing system. This reduction in peak factors is due to the fact that introduction of stormwater into a sanitary sewer system serving new developments can more readily be prevented whereas sanitary sewer systems serving existing (older) residential areas are more susceptible to wet weather inflow from roof drains, yard drains, sump pumps, infiltration, etc.

At the present time, detailed data is not available for wet weather flows from sanitary sewer systems which primarily serve office, business park and multi-family developments similar to the type of development uses contemplated for the ECSQ site. If such data were available, it is likely that actual peak factors would be lower than those permitted in the intergovernmental agreement for daily wet weather and peak hourly wet weather flows. Since detail data is not available to document reduced wet weather peaking factors, the actual peaking factors determined for wastewater flow from Warrenville over the past 12 months will be used to project peak flows from the ECSQ site.

C. Existing Warrenville Wastewater Flow

1) Average Daily Dry Weather Flow

Table 1 has been prepared to summarize wastewater flow data furnished by Warrenville. This data sets forth the average daily dry weather flow as defined in the intergovernmental agreement between Warrenville and Naperville. The 13 month time period contained in Table 1 begins with July 1, 1989 and ends on July 31, 1990. A 13 month time frame was used due to the unavailability of flow

data for October 1989. Based upon the data shown in Table 1 the average daily dry weather flow for the lowest three flow months is calculated to be 0.927 MGD. The intergovernmental agreement between Warrenville and Naperville limits the daily wet weather flow to 250 percent of the average daily dry weather flow. Based upon an average daily dry weather flow of 0.927 MGD, the current maximum allowable daily wet weather flow is 2.50 x 0.927 MGD or approximately 2.32 MGD.

TABLE 1

WARRENVILLE WASTEWATER DATA
AVERAGE DAILY DRY WEATHER FLOW

Month/Year	Total Flow (MG)	Days	Avg Daily Flow (MG)
7-89	31.723	31	1.023
8-89	30.410	31	0.981*
9-89	30.099	30	1.003
10-89	NO DATA	AVAILABLE	
11-89	27.016	30	0.901*
12-89	27.889	31	0.900*
1-90	36.412	31	1.175
2-90	34.897	28	1.246
3-90	46.139	31	1.488
4-90	34.536	29**	1.191
5-90	51.866	31	1.673
6-90	37.623	30	1.254
7-90	34.533	31	1.114

*Lowest 3 months in 12 month period
**4-1-90 data missing

Flow data taken at Warrenville Measurement Station

Computation of Average Daily Dry Weather Flow
per Wastewater Utility Service Agreement

Mon/Yr	Flow	Days
8-89	30.410	31
11-89	27.016	30
12-89	27.889	31
	---	---
	85.315 /	92 = 0.927 MG

Average Daily Dry Weather
Flow (Qadf) = 0.927 MG

2) Daily Wet Weather Flow

Table 2 sets forth the highest wet weather flow day for each month and the peaking ratio for the wet weather flow day to the average daily dry weather flow. During the aforementioned 12 month time period there were 6 days when wet weather flow exceeded 2.32 MGD, the calculated allowable maximum daily wet weather flow.

On two occasions, unusually high and prolonged wet weather flow occurred. First, during a three day period in March, 1990 (March 9, 10, 11) City of Warrenville Public Works personnel stated that high levels of stormwater flow in streams adjacent to sanitary sewers may have inundated sanitary manholes which did not have watertight lids. Second, on May 9 and May 10, unusually high wet weather flows were experienced due to unauthorized discharge of stormwater into Warrenville's sanitary sewer system from the Maple Hill development. These two occasions created an aberration in the data which can be discarded in the determination of average peaking factors relating wet weather to dry weather flows.

In general, peaking factors for the existing flows shown on Table 2 are less than the 250 percent peak factor set forth in the intergovernmental agreement. The average of these peak factors, exclusive of the March and May, 1990 peaks, can serve as a representative wet weather peak flow factor for projecting future peak day flows from Warrenville.

TABLE 2

WARRENVILLE WASTEWATER DATA
DAILY WET WEATHER FLOW

Average Daily Flow (Qadf) = 0.927 MG
Maximum Allowable Wet Weather Daily Flow = 2.318 MG
(0.927 MG x 250 percent)

		Daily Wet Weather Flow	
Date	Day	Highest Day (MG)	Peak Factor*
7-30	Sun	1.811	1.95
8-05	Sat	1.333	1.44
9-01	Fri	1.813	1.96
11-15	Wed	1.015	1.09
12-22	Fri	0.983	1.06
1-25	Thu	1.851	2.00
2-22	Thu	1.907	2.06
3-10	Sat	2.834	3.07**
3-08	Thu	2.300	2.48
4-14	Sat	1.538	1.66
5-10	Thu	5.871	6.40**
5-11	Fri	2.328	2.51
6-14	Thu	2.305	2.49
7-20	Fri	1.671	1.80
			22.50

Average Daily Wet Weather Peak Factor = 22.5/12 x 100 = 188 percent

*Peak Factor = Highest Day Flow/Qadf
**Not used in the computation of the average daily wet weather peak factor. Rather, the second highest day was selected for the month.

Average Daily Wet Weather Peak Factor = 188 percent

3) Peak Hourly Wet Weather Flow

Table 3 presents peak hourly wet weather flow rates from July 1989 to July 1990. Based upon the 0.927 MGD average daily dry weather flow the calculated maximum allowable peak hourly flow rate is 4.00 x 0.927 MGD or 3.71 MGD. During the aforementioned 12 month time period there were five occasions when the peak hourly flow rate exceeded the 3.71 MGD limit. To determine a representative, historical

peak hourly factor which was not overly sensitive to extreme events nor overly "dampened" by non-rainfall peak flows, an engineering judgement was made to select the three highest peak hour flow conditions experienced each month. These three peak flows from each month would be averaged over a twelve month interval to compute an "average" peak hourly factor.

Typical ratios for peak hourly wet weather flows to average daily dry weather flow ranged from 1.52 to 4.89. For the three highest peak hour flow conditions experienced each month the average peak hour ratio for a 12 month period is 265 percent which is significantly less than the 400 percent factor set forth in the intergovernmental agreement. This average peak hour factor is appropriate for projecting future peak hour flows from additional developments in Warrenville and the ECSQ site.

TABLE 3

WARRENVILLE WASTEWATER DATA
PEAK HOURLY WET WEATHER FLOW

Average Daily Flow (Qadf) = 0.927 MG
Maximum Allowable Peak Hourly Wet Weather Flow Rate = 3.71 MGD
(0.927 MGD x 400 percent)

Month/Year	Day/Date	Hour	Peak Hourly Flow Rate (MGD)	Peak Factor (Peak/Qadf)
7-89	Su, 30th	1	3.206	3.46
	Th, 20th	1	2.079	2.24
	Tu, 18th	18	2.073	2.24
8-89	Sa, 12th	17	2.244	2.42
	Fr, 11th	15	1.921	2.07
	Sa, 5th	10	1.849	1.99
9-89	Fr, 1st	3	4.529	4.89
	Sa, 9th	9	2.046	2.21
	We, 13th	7	1.882	2.03
11-89	Su, 26th	11	1.410	1.52
	Th, 23rd	12	1.486	1.60
	Tu, 7th	8	1.436	1.55
12-89	Sa, 9th	10	1.420	1.53
	Sa, 23rd	11	1.427	1.54
	Su, 3rd	11	1.410	1.52
1-90	Th, 25th	8	2.907	3.14
	We, 17th	8	2.425	2.62
	Fr, 26th	19	2.303	2.48
2-90	Th, 22nd	16	3.053	3.29
	Fr, 23rd	8	2.244	2.42
	Sa, 3rd	11	2.179	2.35
3-90	Sa, 10th	14	4.128	4.45
	Th, 8th	16	4.098	4.42
	Su, 11th	10	3.421	3.69
4-90	Sa, 14th	11	1.942	2.09
	Fr, 20th	21	1.807	1.95
	Sa, 21st	11	1.750	1.89
5-90	Fr, 4th	8	4.443	4.79
	Fr, 11th	8	3.165	3.41
	Sa, 12th	10	2.841	3.06
6-90	Th, 14th	8	3.631	3.91
	We, 13th	23	3.017	3.25
	Fr, 29th	8	2.690	2.90
7-90	Fr, 20th	8	2.050	2.21
	Th, 19th	19	1.932	2.08
	We, 11th	8	1.847	1.99

				95.22

Average Peak Hourly Wet Weather Factor = Sum of the highest 3 Peak Factors for each month/36 x 100 = 95.22/36 x 100 = 265 percent

Average Peak Hour Factor = 265 percent

D. Projected ECSQ Wastewater Flow

1) Average Daily Dry Weather Flow

As stated before, the ECSQ site is being planned as a multi-use, multi-year development. Table 4 sets

forth the anticipated land uses, acreages and daily dry weather flows resulting from a development with potential net acreages ranging from 500 to 525 acres; the balance of the property will be utilized for infrastructure and open space. Given this development range, the projected daily dry weather flow rate from the ECSQ site when fully developed is between 900,000 to 1,400,000 gallons. For purposes of wastewater flow assumption relative to Springbrook Treatment Plan capacity requirements, this report is based upon a required treatment plant capacity of 1,000,000 gallons per day dry weather flow.

TABLE 4

ECSQ DRY WEATHER
WASTEWATER FLOW PROJECTION

CONCEPT A

LAND USE	SIZE	WATER USAGE RATE	TOTAL DAILY WATER USE (MG)
1. Corporate User	1,160,000 SF	0.15 GPD/SF	0.174
2. Office	4,340,000 SF	0.10 GPD/SF	0.434
3. Business Park	2,825,000 SF	0.04 GPD/SF	0.113
4. Retail	250,000 SF	0.10 GPD/SF	0.025
5. Hotel	500 Rooms	250 GPD/Room	0.125
6. Residential	425 Units	250 GPD/Unit	0.106
			TOTAL USE = 0.977 MG

Total Daily Wastewater Flow* = 0.90 x 0.977 MG = 0.879 MG*

Say 900,000 gallons

CONCEPT B

1. Corporate User	2,110,000 SF	0.15 GPD/SF	0.317
2. Office	4,175,000 SF	0.10 GPD/SF	0.418
3. Business Park	1,860,000 SF	0.04 GPD/SF	0.074
4. Retail	250,000 SF	0.10 GPD/SF	0.025
5. Hotel	500 Rooms	250 GPD/Room	0.125
6. Residential	550 Units	250 GPD/Unit	0.137
			TOTAL USE = 1.096 MG

Total Daily Wastewater Flow = 0.90 x 1.096 MG = 0.986 MG*

Say, 1,000,000 gallons

CONCEPT C

1. Corporate User	3,133,333 SF	0.15 GPD/SF	0.470
2. Office	6,190,000 SF	0.10 GPD/SF	0.619
3. Business Park	2,750,000 SF	0.04 GPD/SF	0.110
4. Retail	370,000 SF	0.10 GPD/SF	0.037
5. Hotel	468 Rooms	250 GPD/Room	0.117
6. Residential	812 Units	250 GPD/Unit	0.203
			TOTAL USE = 1.556 MG

Total Daily Wastewater Flow* = 0.90 x 1.556 MG = 1.400 MG*

Say 1,400,000 gallons

*For planning purposes, wastewater flow (sanitary sewage) is assumed to be 90% of water consumption.

2) Daily & Peak Hourly Wet Weather Flows

Daily and Peak Hourly Wet Weather Flows can be computed on the basis of the projected average daily dry weather flow for the alternative development concepts and peaking factors currently experienced in Warrenville. These flow rates would represent the anticipated actual flow from the ECSQ site given a range of development densities. In addition, the worst-case flows to the Naperville Interceptor System can be determined by computing the projected wastewater flow from the ECSQ site on the basis of the peaking factors permitted in the intergovernmental agreement between Warrenville and Naperville.

Table 5 sets forth the projected flow rates from the ECSQ site for Development Concepts A, B & C under dry weather and wet weather conditions.

TABLE 5

ECSQ WET WEATHER WASTEWATER FLOW PROJECTION

ECSQ Development Concept	Average Daily Dry Weather Flow Rate	Daily Wet Weather Flow Rate		Peak Hourly Wet Weather Flow Rate	
		1.88 Peak Factor	2.50 Peak Factor	2.65 Peak Factor	4.00 Peak Factor
A	0.90 MG	1.69 MG	2.25 MG	2.38 MGD	3.60 MGD
B	1.00 MG	1.88 MG	2.50 MG	2.65 MGD	4.00 MGD
C	1.40 MG	2.63 MG	3.50 MG	3.71 MGD	5.60 MGD

Based upon current development planning, Concept B is the most likely development scenario and will be used in the projection of anticipated actual flows to the interceptor sewers. Concept C will be used in the projection of theoretical maximum flows to analyze the worse-case impact to Naperville's interceptor system.

V. NAPERVILLE SYSTEM DATA

There are four components within Naperville's overall wastewater collection and treatment system which are affected by wastewater flow from the ECSQ property. These components are: the Springbrook Regional Water Reclamation Center, the Springbrook Interceptor Sewer, the Northwest Pump Station and the River Road Interceptor Sewer. (See Exhibit 2)

A. Springbrook Regional Water Reclamation Center

The City of Naperville owns and operates a wastewater treatment plant known as the Springbrook Regional Water Reclamation Center. This plant was originally constructed between 1973 and 1975. It was completed and put in service in 1976. It has since been expanded two times with completion of the most recent expansion planned in 1991. Current capacity is 15 MGD design average flow (DAF) and 35 MGD design maximum flow (DMF). Capacity after the 1990-91 expansion will be the 18.75 MGD design average flow (DAF) and 40.30 MGD design maximum flow (DMF).

The Springbrook treatment plant can be readily expanded due to the availability of adequate land area at the plant site and previous planning which was undertaken in anticipation of future plant expansions. Mr. Poole has stated that adequate capacity can be made available to accommodate wastewater flow from the ECSQ site. This capacity increase would be addressed as part of an amended intergovernmental agreement between Warrenville and Naperville.

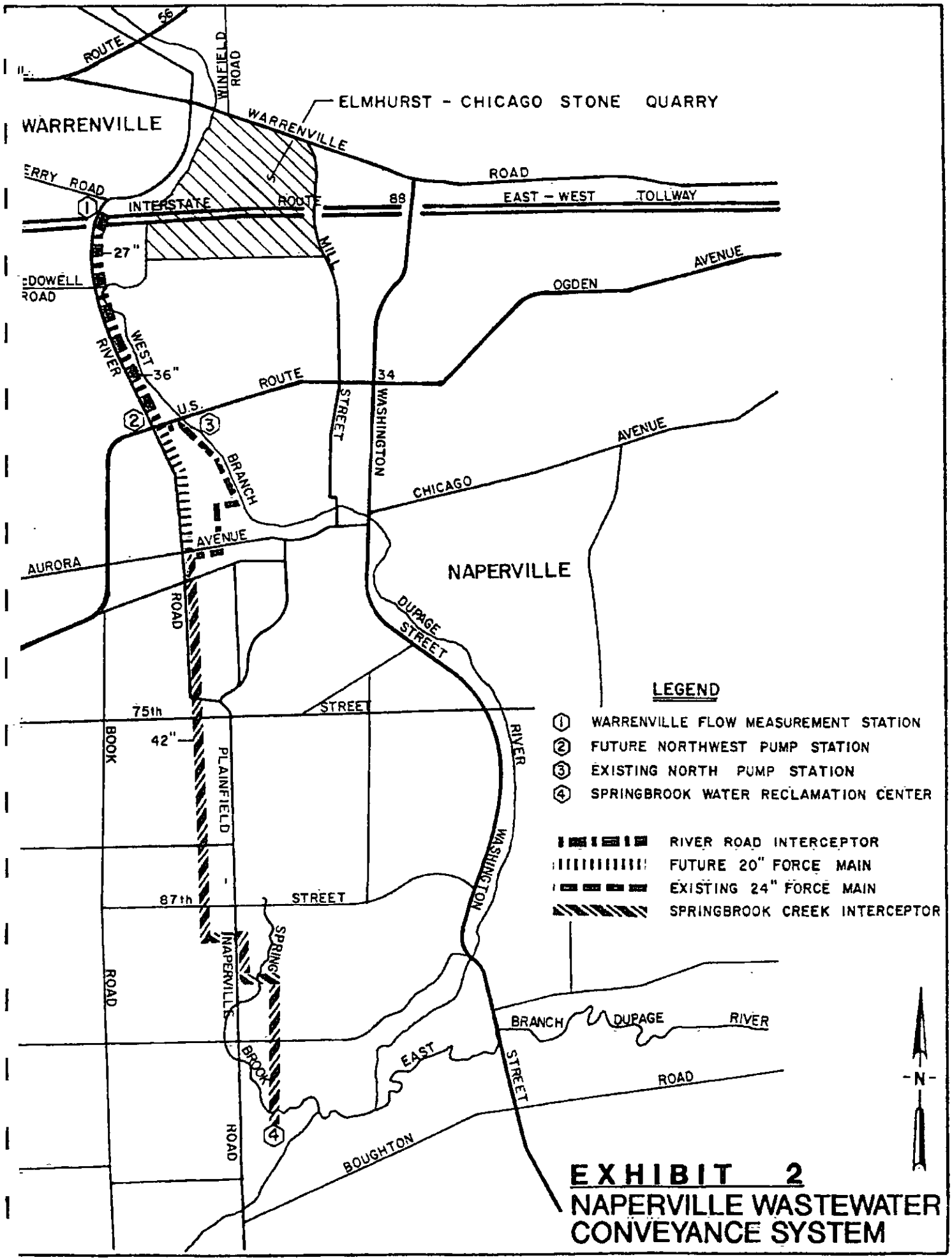


EXHIBIT 2
NAPERVILLE WASTEWATER CONVEYANCE SYSTEM

B. Naperville Interceptor Sewer System

Naperville's Water and Wastewater Utility Department operates a number of major interceptor sewers which convey wastewater flow to the Springbrook Regional Water Reclamation Center. Two of these interceptors are utilized in the conveyance of wastewater from Warrenville to the treatment plant. These same interceptors would also be used to convey wastewater from the ECSQ site to the plant. The portions of the Naperville interceptor sewer system affected by flow from the City of Warrenville and the ECSQ site are: 1) the 42" diameter Springbrook Creek Interceptor; 2) the Northwest Wastewater Pump Station and 20" diameter Force Main; and 3) the 27" and 36" diameter River Road Interceptor.

1) 42" Springbrook Interceptor Sewer

This interceptor sewer is the major conveyance sewer for all wastewater originating from Warrenville and the northwesternmost portions of the City of Naperville. It ranges in depth from 8.6 feet to 34.75 feet with an average depth between 18 to 23 feet. Table 6 presents the physical data pertaining to the Springbrook Interceptor Sewer. Manhole No. 1 is located at the discharge end of the sewer adjacent to the Springbrook Treatment Plant. Manhole No. 60 is located at the receiving end of the system approximately 4.9 miles north of the treatment plant and 2.5 miles south of the ECSQ site.

The information contained within Table 6 which is of particular significance in this study is the flowing full capacity of the interceptor. Over 77 percent of the length of this sewer has a flowing full (Manning's) capacity of 20 MGD. At 12 sewer

TABLE 6

SPRINGBROOK INTERCEPTOR SEWER

AURORA AVENUE TO SPRINGBROOK WATER RECLAMATION CENTER

MANHOLE	GROUND ELEV USGS	INVERT ELEV USGS	DEPTH FEET	DISTANCE FEET	SLOPE %	SIZE DIA	CAPACITY RUN/FULL MGD	FLOW VELOCITY FPS	COMMENTS
60	693.68	682.51	11.17						NE corner Aurora&River(54" casir
59A	694.49	682.19	12.30	90	0.36	36"	25.84	5.66	Aurora Avenue crossing
59	690.42	678.87	11.55	330	1.00	36"	43.07	9.44	River Road
58	691.78	677.48	14.30	431	0.40	36"	27.24	5.97	River Road
57	696.00	675.56	20.44	402	0.40	36"	27.24	5.97	River Road
56	701.04	674.97	26.07	337	0.17	42"	26.79	4.31	Oswego Road crossing
55	700.05	674.95	25.10	385	0.10	42"	20.55	3.31	
54	685.74	674.04	11.70	385	0.23	42"	31.16	5.02	
53	684.24	673.74	10.50	407	0.07	42"	17.19	2.77	
52	682.46	673.06	9.40	385	0.17	42"	26.79	4.31	
51	681.08	672.48	8.60	520	0.10	42"	20.55	3.31	
50	681.94	672.04	9.90	498	0.10	42"	20.55	3.31	
49	681.57	671.51	10.06	505	0.10	42"	20.55	3.31	
48	680.12	670.90	9.22	513	0.10	42"	20.55	3.31	
47	679.87	670.37	9.50	506	0.10	42"	20.55	3.31	
46	679.74	669.84	9.90	507	0.10	42"	20.55	3.31	
45	689.47	669.27	20.20	506	0.11	42"	21.55	3.47	
44	685.21	668.81	16.40	551	0.08	42"	18.38	2.96	75th Street crossing
43	680.44	668.54	11.90	498	0.05	42"	14.53	2.34	
42	678.47	667.97	10.50	504	0.11	42"	21.55	3.47	
41	689.05	667.35	21.70	496	0.12	42"	22.51	3.62	
40	701.00	667.10	33.90	497	0.05	42"	14.53	2.34	
39	690.13	666.83	23.30	505	0.05	42"	14.53	2.34	
38	684.63	666.03	18.60	550	0.14	42"	24.31	3.91	
37	693.94	665.64	28.30	549	0.07	42"	17.19	2.77	
31	677.62	665.26	12.36	409	0.00	42"	18.38	2.96	Drop Manhole-upper
31	677.62	655.82	21.80						Drop Manhole-lower
30	678.43	655.03	23.40	503	0.15	42"	25.16	4.05	32-33-34-35-36 not used
29	682.70	654.70	28.00	401	0.08	42"	18.38	2.96	
28	675.50	654.53	20.97	300	0.10	42"	20.55	3.31	
27	682.08	653.78	28.30	504	0.10	42"	20.55	3.31	
26	688.36	653.61	34.75	492	0.10	42"	20.55	3.31	
25	682.00	653.06	28.94	505	0.10	42"	20.55	3.31	
24	684.50	652.45	32.05	497	0.12	42"	22.51	3.62	
23	681.75	651.55	30.20	506	0.10	42"	20.55	3.31	
22	678.87	651.37	27.50	499	0.04	42"	12.99	2.09	Contract E
21	681.42	650.72	30.70	498	0.13	42"	23.43	3.77	Contract D-87th Street crossing
20	675.46	650.16	25.30	499	0.11	42"	21.55	3.47	
19	669.88	649.58	20.30	506	0.11	42"	21.55	3.47	
18	669.00	649.40	19.60	445	0.04	42"	12.99	2.09	
17	668.57	648.77	19.80	506	0.12	42"	22.51	3.62	
16	666.90	648.23	18.70	499	0.09	42"	19.49	3.14	
15	663.57	647.87	15.70	529	0.08	42"	18.38	2.96	
14	666.45	645.00	21.45	531	0.54	42"	47.75	7.68	
13	663.83	642.48	21.35	514	0.49	42"	45.48	7.32	
12	652.09	640.09	12.00	531	0.45	42"	43.59	7.01	
11	646.77	636.97	9.80	425	0.73	42"	55.51	8.93	
10	650.03	635.43	14.60	430	0.36	42"	38.98	6.27	
9	665.02	632.72	32.30	561	0.48	42"	45.01	7.24	
8	661.67	629.47	32.20	550	0.50	42"	49.48	7.96	
7	652.95	628.35	24.60	543	0.20	42"	29.06	4.68	
6	651.00	627.50	23.50	461	0.18	42"	27.57	4.44	95th Street crossing
5	647.03	626.63	20.40	500	0.17	42"	26.79	4.31	
4	640.71	625.41	15.30	499	0.22	42"	30.48	4.90	
3	637.31	624.21	13.10	505	0.23	42"	31.16	5.02	
2	637.07	623.15	13.92	485	0.22	42"	30.48	4.90	
1	637.83	622.23	15.60	407	0.22	42"	30.48	4.90	
JUNCTION MH	637.70	621.40	16.30	396	0.22	42"	30.48	4.90	
WET WELL	638.00	618.02	19.98	347	0.13	48"	33.66	4.15	
TOTAL				25985					4.92 Miles

segments (length of sewer pipe between 2 adjoining manholes) the flowing full capacity of the 42" diameter interceptor is less than 20 MGD. At two of these twelve segments the capacity is less than 13 MGD. The segments having a capacity of less than 20 MGD comprise 23 percent of the total system and the segments having a capacity less than 13 MGD comprise 4 percent of the total length of the interceptor. These segments are noteworthy because peak (wet weather) flows may cause some surcharging in these segments.

Section VI of this report develops the projected peak flows when the areas tributary to the north end of the Springbrook Interceptor Sewer are fully developed. The adequacy of the Springbrook Interceptor Sewer's conveyance capacity is also analyzed in Section VI based upon the projected peak flows from the interceptor's service area.

2) Northwest Wastewater Pump Station & 20" Force Main

The Northwest Wastewater (NW) Pump Station is a new, and as yet unconstructed, pump station which will be located at the corner of River Road and Ogden Avenue approximately 6.0 miles north of the treatment plant and 1.3 miles south of the ECSQ site. It was originally planned to be constructed in 1990 but has since been deferred to 1991 and may possibly be deferred beyond 1991 depending upon available funding. A new 20" force main extends from the pump station south along River Road and discharges into Manhole No. 60 of the 42" Springbrook Interceptor Sewer. This force main is currently under construction and will be completed in 1990.

The NW pump station and force main were designed to intercept wastewater which currently flows through the River Road Interceptor Sewer to the existing North Pump Station located at the West Branch of the DuPage River and Ogden Avenue. It will alleviate the capacity limitations of the North Pump Station and corresponding 24" force main. Unlike the Springbrook and River Road Interceptor Sewers, the NW Pump Station and 20" Force Main were planned to provide capacity for ECSQ wastewater flow if, and when, the property was developed.

If development of the ECSQ site is to occur in the next few years, the City of Naperville will probably construct the aforementioned pump station at its ultimate capacity. If the ECSQ development is not imminent, the pump station would initially be constructed with a lower capacity. The design capacities of the Northwest and North Pump Stations as planned by Naperville with and without the ECSQ site are shown in Table 7.

TABLE 7

NORTH & NORTHWEST WASTEWATER PUMP STATIONS
DESIGN CAPACITY

	Peak Pumping Capacity	
	w/0 ECSQ Site	w/ECSQ Site
North Pump Station	10.94 MGD	10.94 MGD
Northwest Pump Station	4.37 MGD	8.57 MGD
Total =	15.31 MGD	19.51 MGD*

*Total delivery capacity to the northernmost portion of the Springbrook Interceptor Sewer.

It should also be noted that diversion capabilities have been designed into the NW Pump Station. If inflow to the station exceeds pumping capacity, or if failure of one or more pumps is experienced, wastewater flowing into this pump station can be diverted through the existing 36" sewer flowing east along Ogden Avenue to the North Pump Station. From this station, wastewater can be pumped to the 42" Springbrook Interceptor in the same manner it currently flows to the interceptor.

3) <u>River Road Interceptor Sewer</u>

The River Road Interceptor Sewer contains two segments of gravity sewers with different diameters.(See Exhibit 3) The 36" diameter portion of the interceptor begins at the proposed NW Pump Station (existing Manhole No. 7) and extends northerly along River Road to Manhole No. 19. Manhole No. 19 serves as a junction structure for a 24" trunk sewer extending west along McDowell Road and the 27" diameter portion of the River Road Interceptor Sewer which extends northerly along River Road. The 27" diameter interceptor sewer terminates in Manhole No. 29 which is also the location of the Warrenville Flow Measurement Station.

The River Road Interceptor Sewer provides conveyance for all wastewater flows originating from the City of Warrenville and those portions of the City of Naperville located north of the Burlington Northern Railroad and west of River Road. This interceptor sewer ranges in depth from 17.6 to 41.5 feet with an average depth between 26 and 30 feet. Table 8 presents the physical data pertaining to the River Road Interceptor Sewer. Due

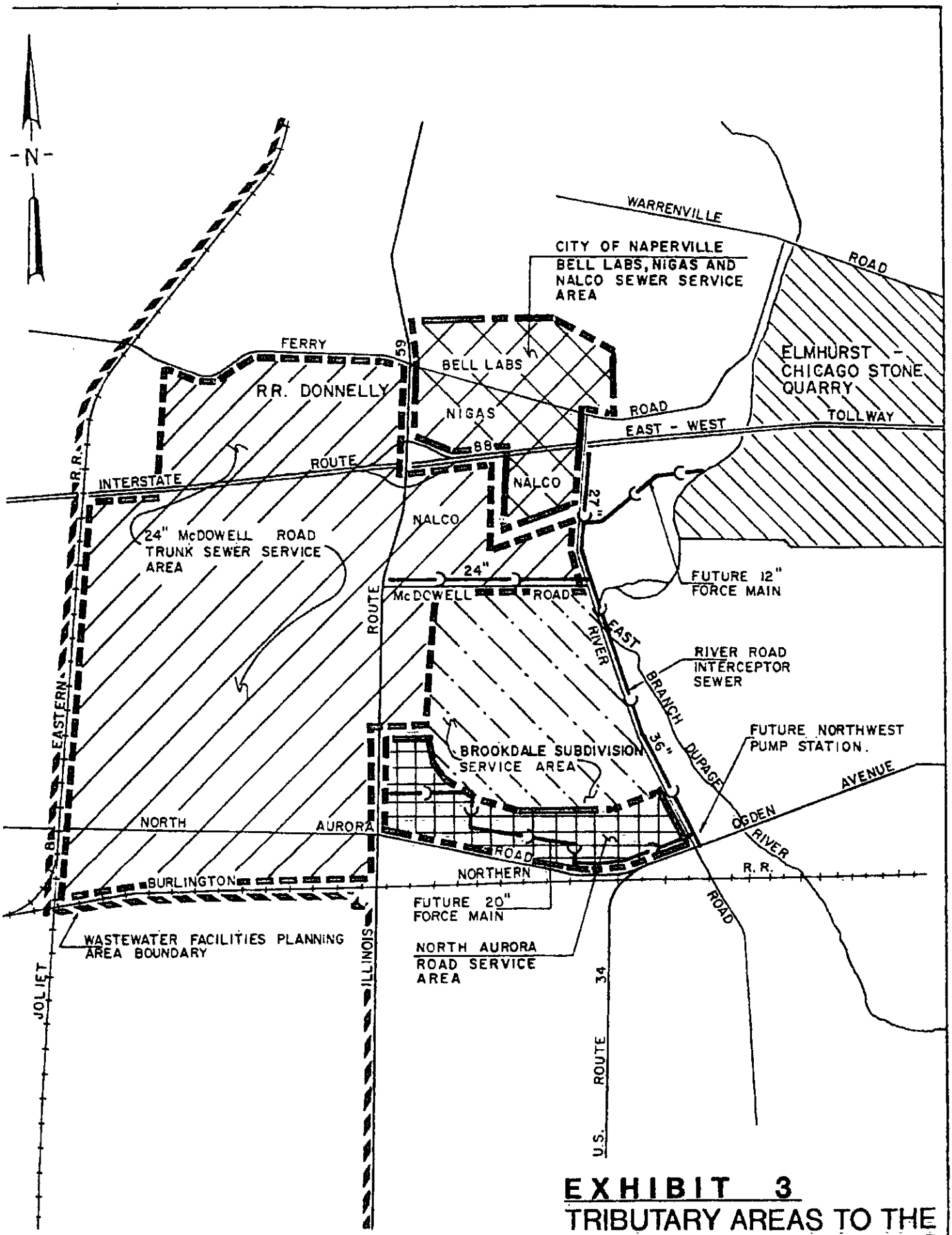


EXHIBIT 3

TRIBUTARY AREAS TO THE RIVER ROAD INTERCEPTER

TABLE 8

RIVER ROAD INTERCEPTOR SEWER
FROM NORTHSIDE AT INTERSTATE 88 (E-W TOLLWAY TO NORTH WASTEWATER PUMP STATION)
AT 1200 OGDEN AVENUE

MANHOLE	GROUND ELEV USGS	INVERT ELEV USGS	DEPTH FEET	DISTANCE FEET	SLOPE %	SIZE DIA	CAPACITY RUN/FULL MGD	FLOW VELOCITY FPS	COMMENTS
29	701.95	676.38	25.57						Flow Measure Sta (Parshall Flume)
28	696.67	675.69	20.98	345	0.07	27"	5.30	2.06	I-88 Crossing (225'-48"steel case)
27	703.97	674.78	29.19	440	0.07	27"	5.30	2.06	
26	702.73	674.65	29.32	142	0.07	27"	5.30	2.06	River Rd Crossing
25	697.04	674.36	28.37	516	0.06	27"	4.90	1.91	
24	695.32	673.90	23.14	615	0.07	27"	5.30	2.06	
23	714.56	673.44	21.88	583	0.08	27"	5.66	2.20	
22	706.38	673.03	41.53	282	0.14	27"	7.49	2.92	
21	704.89	672.74	33.64	292	0.10	27"	6.33	2.46	
20	699.55	672.82	32.07	232	-0.03	27"			Reverse Slope-River Rd Crossing
19	693.44	672.20	27.35	440	0.14	36"	16.11	3.53	
18	694.28	671.84	21.60	526	0.07	36"	11.39	2.50	
17A	701.25	671.81	22.47	98	0.03	36"	7.46	1.63	
17	698.04	671.48	26.56	341	0.09	36"	12.92	2.83	Inc 127'Jacking Pipe (30-35'depth)
16	688.45	671.01	27.03	605	0.08	36"	12.18	2.67	
15A	690.54	670.89	17.56	306	0.04	36"	8.61	1.89	
15	692.08	670.54	20.00	285	0.12	36"	14.92	3.27	
14	693.68	669.90	22.18	598	0.11	36"	14.28	3.13	
13	701.12	669.90	23.78	460	0.00	36"			
12	700.07	669.92	31.20	243	-0.01	36"			Reverse Slope
11A	696.20	669.70	30.37	327	0.07	36"	11.39	2.50	
11	696.00	669.32	26.88	103	0.37	36"	26.20	5.74	Brookdale Blvd Crossing
10	697.50	669.03	28.47	455	0.06	36"	10.55	2.31	
9	692.92	668.82	28.68	452	0.05	36"	9.63	2.11	
8	698.42	668.32	24.60	456	0.11	36"	14.28	3.13	
7	703.02	667.32	31.10	453	0.22	36"	20.20	4.43	
6	703.00	667.26	35.76	190	0.03	36"	7.46	1.63	River Rd Crossing (84'Jacking Pipe)
5	701.92	667.12	35.88	249	0.06	36"	10.55	2.31	Ogden Crossing (160'-54"steel case)
4	699.12	666.82	35.10	409	0.07	36"	11.39	2.50	
3	682.54	661.30	37.82	392	1.41	36"	51.14	11.20	
2	682.28	660.48	22.06	186	0.44	36"	28.57	6.26	DuPage River Crossing
1	679.53	660.33	21.95	57	0.26	36"	21.96	4.81	
JUNCTION MAN HOLE	680.50	658.02	22.48	538	0.43	36"			Existing 30" S.S. at 0.25% slope to Wet Well

Above information from "As-Built" plans by Clark, Dietz & Associates-Engineers, Inc. entitled "Drawings for Warrenville Interceptor Sewer-Phase I Contract F" dated Feb. 1975, and "Drawings for River Road Interceptor Sewer-Phase II Contract G" dated Feb. 1976

to the construction of the NW Pump Station, only that portion of the River Road Interceptor Sewer located between Manhole Nos. 7 and 29 enters into the capacity considerations of this study.

With respect to the capacity of the 36" diameter portion of the interceptor, over 75 percent of the total length of the 36" sewer has a flowing full capacity of 10 MGD or greater. Five segments, or 25 percent of the total length of the 36" diameter sewer, have a capacity less than 10 MGD.

With respect to the capacity of the 27" diameter portion of the interceptor, over 78 percent of the total length of the 27" sewer has a flowing full capacity of 5 MGD or greater. Two segments, or 22 percent of the total length of the 27" diameter sewer have a capacity less than 5 MGD.

Section VI develops the projected peak flows to the north end of the 27" diameter portion of the River Road Interceptor and to the north end of the 36" diameter portion of the interceptor when the tributary areas to each part of the River Road interceptor sewer are fully developed. These flows are used to evaluate the adequacy of the River Road Interceptor Sewer.

C. <u>River Road Interceptor Projected Future Flows</u>

Mr. Poole also indicated that additional flows resulting from future development within Naperville must be included in the projection of total flows to be conveyed by the River Road Interceptor Sewer. It is Naperville's intention to reserve and protect a sufficient portion of the remaining capacity of this sewer to ensure that future development in this part of Naperville may occur

without limitation due to lack of interceptor sewer capacity. In order to properly evaluate the capacity available for wastewater flow from the ECSQ site, an estimate of flow resulting from future Naperville developments tributary to the River Road Interceptor Sewer has been computed based upon development information provided by Mr. Poole. This information is set forth in Table 9.

TABLE 9

FUTURE NAPERVILLE WASTEWATER FLOW
TO
RIVER ROAD INTERCEPTOR SEWER

Wastewater Flow Tributary to
27" Diameter River Road Sewer
(See Exhibit 3)

Origin	Type of Development	Square Footage	Average Daily Flow: Projected Flow/Unit	Average Daily Flow: Dry Weather Flow(MG)
1. NI Gas Co. Headquarters	Office	2,000,000	0.10 gpd/s.f.	0.20
2. Bell Labs Property	Office/Research	2,000,000	0.15 gpd/s.f.	0.30
3. Nalco Corp.	Office/Research	600,000	0.15 gpd/s.f.	0.09
			Total =	0.59

Wastewater Flow Tributary to
36" Diameter River Road Sewer
(See Exhibit 3)

Origin	Type of Development	No. of Acres or Dwelling Units	Average Daily Flow: Projected Flow/Unit	Average Daily Flow: Dry Weather Flow(MG)
4. 24" McDowell Rd Trunk Sewer Service Area	Mixed Use	2100 Acres	----	2.00*
5. Brookdale Subdivision	Residential	780 D.U.	3.5 P.E./D.U.	0.27
			Total =	2.27

*For computation of this flow see Appendix B

VI. EVALUATION OF NAPERVILLE SYSTEM CAPACITY

A. Evaluation Assumptions

A comparison of future wastewater flow to the capacity of the individual components of Naperville's wastewater conveyance system is necessary to determine the adequacy of Naperville's system. The effect of average daily dry weather, daily wet weather and peak hourly wet weather flows must be analyzed and compared to interceptor sewer and pump station capacity. If surcharges result they must be reviewed to determine if wastewater rises to unacceptable elevations at any location along the length of the sewer.

Three assumptions have been made to facilitate the evaluation of existing interceptor sewer capacity. First, with respect to the computation of peak flow rates, it is recognized that calculating the maximum peak hourly wet weather flow rate by simply adding the peak hour flows from large, independent service areas produces flow rates which are higher than those actually experienced. This bias to higher theoretical flows occurs because the addition of peak wastewater flows without regard to time assumes that peak hour flow rates from independent service areas occur simultaneously. This assumption is technically incorrect and produces an overly-conservative (higher than actual) estimate of peak flows.

The projection of accurate peak hourly flow rates in interceptor sewers is a complex procedure which is dependent upon many variables within the service area. This level of accuracy is not warranted for this study given the variables contained in the projected future flow rates and, if such a detailed study were undertaken, would only serve to reduce the peak flows set forth in this report. Accordingly, the projected flows analyzed

herein are clearly the "worst-case" flows. If these theoretical flows can be conveyed by the present Naperville system without unacceptable surcharges, then the actual anticipated flows and resulting surcharge depths should also be acceptable.

Second, the data presented in this report allows for a reasonable approximation of the total future flow to the River Road Interceptor Sewer and Northwest Pump Station. The Springbrook Interceptor Sewer, however, will receive some additional flow beyond that received from the River Road Interceptor. No attempt has been made to determine the amount of additional flow to the Springbrook Interceptor inasmuch as some level of reserve capacity appears to be available in the interceptor. Also, Mr. Poole has stated he does not anticipate the addition of substantial additional flows to the Springbrook Interceptor Sewer from the areas in Naperville south of Aurora Avenue.

Third, in comparing the actual peak factors for current wastewater flow from Warrenville to the peak factors contained in the intergovernmental agreement (188 percent calculated to 250 percent regulated for daily wet weather flow and 265 percent calculated to 400 percent regulated for peak hourly flow), it is apparent that application of the intergovernmental agreement peaking factors will produce unrealistically high wet weather flows based upon historical flow data. It would appear that a more realistic assessment of the impact of peak flows on Naperville's interceptor system must take into account the actual historical peak flow factors when determining future wet weather flows.

An analysis of the impact of the theoretical flows based upon peak factors permitted by the intergovernmental agreement is beneficial only as a means of determining

the theoretical maximum flows and the corresponding maximum anticipated surcharges which could occur in Naperville's interceptor sewer system.

For purposes of evaluating Naperville's interceptor sewer capacity, daily wet weather and peak hour wet weather flow rates have been analyzed by using both the average historical peaking factors and the theoretical (intergovernmental agreement) maximum peaking factors. This methodology should provide a reliable estimation of the anticipated actual and theoretical maximum surcharges which would occur in Naperville's interceptor sewer system.

B. River Road Interceptor Sewer - 27" Diameter

1) Projected Design Flows

Flow to the 27" diameter portion of the River Road Interceptor Sewer includes wastewater from the City of Warrenville, the ECSQ site, and the Northern Illinois Gas, Bell Lab and Nalco Corporation sites in Naperville. Table 10 presents design flows to this portion of the River Road Interceptor after full development of the above-referenced properties. Wastewater from the City of Warrenville (exclusive of the ECSQ site) is presented in Table 10 at the maximum daily dry weather flow rate of 1.74 MGD permitted under the intergovernmental agreement between Warrenville and Naperville. Although it is unlikely, in our opinion, that the City of Warrenville (exclusive of the ECSQ site) will ever experience daily dry weather flows of 1.74 MGD due to the limited amount of area remaining to be developed in Warrenville, it is

TABLE 10

RIVER ROAD INTERCEPTOR SEWER
27" DIAMETER
DESIGN FLOWS

ANTICIPATED ACTUAL FLOWS:

CONTRIBUTING AREA	AVERAGE DAILY DRY WEATHER FLOW (MGD)	DAILY WET WEATHER FLOW PEAKING FACTOR	DAILY WET WEATHER FLOW DAILY FLOW (MG)	PEAK HOURLY WET WEATHER FLOW PEAKING FACTOR	PEAK HOURLY WET WEATHER FLOW PEAK HOUR FLOW (MGD)
ECSQ Site	1.00	1.88	1.88	2.65	2.65
City of Warrenville	1.74	1.88	3.27	2.65	4.61
City of Naperville	0.59	1.88	1.11	2.65	1.56
-N.I. Gas					
-Bell Lab					
-Nalco Corp.					
Total	3.33		6.26		8.82

THEORETICAL MAXIMUM FLOWS:

CONTRIBUTING AREA	AVERAGE DAILY DRY WEATHER FLOW (MGD)	DAILY WET WEATHER FLOW PEAKING FACTOR	DAILY WET WEATHER FLOW DAILY FLOW (MG)	PEAK HOURLY WET WEATHER FLOW PEAKING FACTOR	PEAK HOURLY WET WEATHER FLOW PEAK HOUR FLOW (MGD)
ECSQ Site	1.40	2.50	3.50	4.00	5.60
City of Warrenville	1.74	2.50	4.35	4.00	6.96
City of Naperville	0.59	2.50	1.48	4.00	2.36
-N.I. Gas					
-Bell Lab					
-Nalco Corp.					
Total	3.73		9.33		14.92

necessary to maintain the permitted flow rate set forth in the intergovernmental agreement for Warrenville so that future development in Warrenville is not limited by the ECSQ development. Therefore, for purposes of capacity analysis, a daily dry weather flow of 3.33 MGD, as shown in Table 10, is the projected anticipated actual daily dry weather flow to the 27" diameter portion of the River Road Interceptor Sewer.

Table 10 also projects future daily wet weather flows of 6.26 MGD. This flow is based upon a peaking factor of 1.88 for wastewater flow from the existing City of Warrenville, the ECSQ site and the Northern Illinois Gas, Bell Lab and Nalco Corp. sites in Naperville.

Finally, Table 10 also shows a future peak hourly wet weather flow rate of 8.82 MGD. This flow is based upon a peaking factor of 2.65 for wastewater flow from the existing City of Warrenville, the ECSQ site and the Northern Illinois Gas, Bell Lab and Nalco Corp. sites in Naperville.

Theoretical maximum flows reflecting the "worst-case" condition of maximum flow from the ECSQ site and the City of Warrenville and peak factors in accordance with the maximum allowable limits set forth in the intergovernmental agreement are calculated to be 3.73, 9.33 and 14.92 MGD for average daily dry weather, daily wet weather and peak hourly flow rates, respectively.

2) Capacity Analysis

a. Anticipated Actual Flows

The projected flow conditions described in the previous section can be compared to the flowing full capacity of the 27" diameter portion of the River Road Interceptor Sewer. Table 11 has been prepared to show surcharge depths in the 27" diameter interceptor sewer when this sewer is subjected to flow rates of 6, 9 and 15 MGD. These flow rates were selected for backwater analysis because they approximate the anticipated actual daily wet weather, peak hourly wet weather and the theoretical maximum peak hourly wet weather wastewater flow conditions. A simplifying, and conservative, assumption in all capacity calculations was made by assuming that the flow rate conveyed through the entire length of the sewer is the sum of all flows tributary to the sewer regardless of the point of inflow into the sewer.

The total average daily dry weather flow in the 27" diameter sewer is 3.33 MG which is less than the pipe's flowing full capacity.

The daily wet weather flow rate of 6.26 MGD exceeds the flowing full capacity of the 27" diameter River Road Interceptor between Manhole Nos. 20-21 and 25-26. A maximum surcharge of 0.47 feet occurs at Manhole Nos. 26 and 27 and can be considered insignificant in its impact to operation of the system.

TABLE 11

RIVER ROAD INTERCEPTOR SEWER
27" DIAMETER
SURCHARGE DATA

UPSTREAM MANHOLE	GROUND ELEVATION	MANHOLE INVERT ELEVATION	WASTEWATER SURCHARGE ELEVATION @ 6 MGD	@ 9 MGD	@ 15 MGD
29	701.95	676.38	678.63	682.38(3.75)	694.62(15.99)
28	696.67	675.69	677.94	681.65(3.71)	692.66(14.72)
27	703.97	674.78	677.50(0.47)	680.72(3.69)	690.17(13.14)
26	702.73	674.65	677.37(0.47)	680.41(3.51)	689.35(12.45)
25	697.04	674.36	676.90(0.29)	679.32(2.71)	686.43(9.82)
24	695.32	673.90	676.34(0.19)	678.02(1.87)	682.96(6.81)
23	714.56	673.44	675.81(0.12)	676.79(1.10)	679.67(3.98)
22	706.38	673.03	675.55(0.27)	676.19(0.91)	678.06(2.78)
21	704.89	672.74	675.28(0.29)	675.57(0.58)	676.40(1.41)
20	699.55	672.82	675.07	675.07	675.07

*Parentheses indicate depth of surcharge above the crown of the sewer. See Appendix C for calculation of surcharge depth.

The peak hour wet weather flow rate of 8.82 MGD results in a maximum surcharge of 3.75 feet over the crown of the pipe at Manhole No. 29. Based upon a review of the rim and invert elevations of the 27" diameter River Road Interceptor Sewer shown in Table 8, a surcharge of 3.75 feet should not create sewer backup problems for adjoining local sewers. This conclusion should, however, be confirmed by a review of the as-built data for connecting sewers available from Naperville and Warrenville.

b. Theoretical Maximum Flows

The theoretical maximum flow rates computed in Table 10 can also be compared to the flow capacity of the 27" diameter interceptor. Under these theoretical conditions, the total average daily dry weather flow is 3.73 MG which is less than the flowing full capacity of the 27" diameter sewer.

The daily wet weather flow rate of 9.33 MG exceeds the flowing full capacity of the 27" diameter sewer and results in a maximum surcharge of 3.75 feet above the crown of the pipe at Manhole No. 29. As stated above, this surcharge should not present sewer backup conditions in adjoining local sewers.

The peak hourly wet weather flow rate of 14.92 MGD significantly exceeds the flowing full capacity of the 27" diameter sewer. Under these flow conditions a maximum surcharge of

15.99 feet is experienced at Manhole No. 29. It is quite possible that a review of the as-built drawings will indicate that a surcharge of 15.99 feet would cause unacceptable sewage backups in either the Warrenville or Naperville systems.

From the data presented above, it is apparent that for five of the six flow conditions, the 27" diameter interceptor sewer has sufficient capacity and no increase in the capacity of the system is required. It is only under the theoretical maximum peak hourly condition that surcharges may create unacceptable sewer backups in adjoining local sewers. If this condition did occur, some type of system capacity enhancement, such as a holding basin, may be required.

C. River Road Interceptor Sewer - 36" Diameter

1) Projected Design Flows

Flow to the 36" diameter portion of the River Road Interceptor Sewer includes wastewater from the 27" diameter portion of the River Road Interceptor, the 24" diameter Naperville trunk sewer along McDowell Road and the Brookdale Subdivision. Table 12 presents the design flows to this portion of the River Road Interceptor Sewer after full development of the areas served by the tributary sewers.

As with the 27" diameter portion of the interceptor, wastewater flow rates are projected as actual anticipated and theoretical maximum flow

rates. Table 12 sets forth average daily dry weather flows of 5.60 MG. It also projects future daily wet weather flows of 10.53 MGD. This flow is based upon a peaking factor of 1.88 for wastewater flow from Warrenville, the ECSQ site, the Northern Illinois Gas, Bell Lab and Nalco Corp. sites in Naperville and the service areas in Naperville tributary to the 24" diameter McDowell Road trunk sewer and the Brookdale Subdivision sewers.

Finally, Table 12 presents a future peak hourly wet weather flow rate of 14.84 MGD. This flow is based upon a peak factor of 2.65 for all tributary wastewater flows.

Theoretical maximum flows reflecting the "worst-case" condition of maximum flow from the ECSQ site and the City of Warrenville and peak factors in accordance with the maximum allowable percentages shown in the intergovernmental agreement are calculated to be 6.00, 15.01 and 24.00 MGD for average daily dry weather, daily wet weather and peak hourly flow rates, respectively.

TABLE 12

RIVER ROAD INTERCEPTOR SEWER
36" DIAMETER
DESIGN FLOWS

ANTICIPATED ACTUAL FLOWS:

CONTRIBUTING AREA	AVERAGE DAILY DRY WEATHER FLOW (MG)	DAILY WET WEATHER FLOW PEAKING FACTOR	DAILY WET WEATHER FLOW DAILY FLOW (MG)	PEAK HOURLY WET WEATHER FLOW PEAKING FACTOR	PEAK HOURLY WET WEATHER FLOW PEAK HOUR FLOW (MGD)
ECSO Site	1.00	1.88	1.88	2.65	2.65
City of Warrenville	1.74	1.88	3.27	2.65	4.61
City of Naperville					
-N.I. Gas, Bell Lab & Nalco Corp.	0.59	1.88	1.11	2.65	1.56
-24" McDowell Road Trunk Sewer Service Area	2.00	1.88	3.76	2.65	5.30
-Brookdale Subdivision	0.27	1.88	0.51	2.65	0.72
Total	5.60		10.53		14.84

THEORETICAL MAXIMUM FLOWS:

CONTRIBUTING AREA	AVERAGE DAILY DRY WEATHER FLOW (MGD)	DAILY WET WEATHER FLOW PEAKING FACTOR	DAILY WET WEATHER FLOW DAILY FLOW (MG)	PEAK HOURLY WET WEATHER FLOW PEAKING FACTOR	PEAK HOURLY WET WEATHER FLOW PEAK HOUR FLOW (MGD)
ECSO Site	1.40	2.50	3.50	4.00	5.60
City of Warrenville	1.74	2.50	4.35	4.00	6.96
City of Naperville					
-N.I. Gas, Bell Lab & Nalco Corp.	0.59	2.50	1.48	4.00	2.36
-24" McDowell Road Trunk Sewer Service Area	2.00	2.50	5.00	4.00	8.00
-Brookdale Subdivision	0.27	2.50	0.68	4.00	1.08
Total	6.00		15.01		24.00

2) Capacity Analysis

a. Anticipated Actual Flows

The projected flow conditions described in the previous section can be compared to the flowing full capacity of the 36" diameter portion of the River Road Interceptor Sewer. Table 13 has been prepared to show surcharge depths in the 36" interceptor sewer when this sewer is subjected to flow rates of 11, 15 and 24 MGD. Once again, these flow rates were selected for backwater analysis because they approximate the anticipated actual daily wet weather and peak hourly wet weather and the theoretical maximum peak hourly wet weather flow conditions.

The total average daily dry weather flow through the 36" diameter sewer is 5.60 MGD which does not exceed the pipe capacity.

The daily wet weather flow rate is 10.53 MGD and slightly exceeds the flowing full capacity of the 36" diameter interceptor sewer. A maximum surcharge of 0.53 feet over the crown of the pipe occurs at Manhole No. 14 which will not present operational problems.

The peak hour weather flow rate is 14.84 MGD which results in a maximum surcharge of 2.55 feet over the crown of the pipe at Manhole No. 19.

TABLE 13

RIVER ROAD INTERCEPTOR SEWER
36" DIAMETER
SURCHARGE DATA

UPSTREAM MANHOLE	GROUND ELEVATION	MANHOLE INVERT ELEVATION	WASTEWATER SURCHARGE ELEVATION @ 11 MGD	@ 15 MGD	@ 24 MGD
20	699.55	672.82	675.43	678.28(2.46)	689.70(13.88)
19	693.44	672.20	675.12	677.75(2.55)	688.31(13.11)
18	694.28	671.84	674.75	677.11(2.27)	686.66(11.82)
17A	701.25	671.81	674.68	676.98(2.17)	686.34(11.53)
17	698.04	671.48	674.44	676.56(2.08)	685.26(10.78)
16	688.45	671.01	674.01	675.83(1.82)	683.36(9.35)
15A	690.54	670.89	673.63	675.45(1.56)	682.39(8.50)
15	692.08	670.54	673.85(0.31)	675.10(1.56)	681.49(7.95)
14	693.68	669.90	673.43(0.53)	674.37(1.47)	679.62(6.72)
13	701.12	669.90	673.10(0.20)	673.81(0.91)	678.17(5.27)
12	700.07	669.92	672.92	673.51(0.59)	677.40(4.48)
11A	696.20	669.70	672.54	673.11(0.41)	676.37(3.67)
11	696.00	669.32	672.46(0.14)	672.98(0.66)	676.03(3.71)
10	697.50	669.03	672.14(0.11)	672.43(0.40)	674.60(2.57)
9	692.92	668.82	671.82	671.88(0.06)	673.18(1.36)
8	698.42	668.32	670.27	671.32	671.75(0.43)
7	703.02	667.32	668.88	669.39	670.32

*Parentheses indicate depth of surcharge above crown of sewer. See Appendix C for calculation of surcharge depth.

Once again, a review of the rim and invert elevations of the 36" diameter River Road Interceptor Sewer indicates that this surcharge should not create local sewer backup problems for adjoining local sewers. This conclusion should also be confirmed by a review of the as-built sewer data for connecting sewers available from the City of Naperville.

b. Theoretical Maximum Flows

The theoretical maximum flow rates computed in Table 12 can also be compared to the flow capacity of the 36" diameter interceptor. Under these theoretical conditions, the total average daily dry weather flow is 6.00 MG which does not exceed the flowing full capacity of the 36" diameter sewer.

The daily wet weather flow rate is 15.01 MG which exceeds the flowing full capacity of the 36" diameter sewer. A maximum surcharge of 2.55 feet above the crown of the pipe occurs at Manhole No. 19 which will not present operational problems.

The peak hourly wet weather flow rate is 24.00 MGD and significantly exceeds the flowing full capacity of the 36" diameter sewer. Under these flow conditions a maximum surcharge of 13.88 feet is experienced at Manhole No. 20. Again, it is possible that a review of the as-built drawings will indicate that a surcharge

of 13.88 feet would cause unacceptable sewage backups.

As in the case of the 27" diameter interceptor, in five of the six flow conditions, the 36" diameter sewer has adequate capacity and would not require capacity enhancement.

D. NW Pump Station

1) Projected Design Flows

Total flow to the NW Pump Station is comprised of flows from the 36" diameter River Road Interceptor Sewer and flows received from the service area west of River Road and north of North Aurora Road in Naperville. Table 14 sets forth the projected flows at the NW Pump Station based upon the same peaking factors used for the analysis of the 36" diameter River Road Interceptor Sewer.

2) Capacity Analysis

a. Anticipated Actual Flows

If the projected flow conditions shown in Table 14 are compared to the design capacity of the NW Pump Station shown in Table 7 (8.57 MGD), it is apparent that this pump station can accommodate all dry weather flow (5.69 MGD) to the station without diversion. For daily and peak hourly wet weather flows of 10.70 MGD and 15.08 MGD, 2.13 MGD and 6.51 MGD, respectively, would be diverted to the

North Pump Station. The combined capacity of the Northwest and North Pump Stations is 19.51 MGD. Therefore, depending on the flow to the North Pump Station from other tributary areas within Naperville, the capacity of both pump stations may be temporarily exceeded under certain peak hourly flow conditions and some reserve capacity would have to be provided in the system.

b. Theoretical Maximum Flows

The theoretical maximum flow rates computed in Table 14 can also be compared to the flow capacity of the NW Pump Station. Under these theoretical conditions, the total average daily dry weather flow is 6.09 MG which does not exceed the design capacity of the NW Pump Station.

The daily wet weather flow rate of 15.24 MG does exceed the design capacity of the NW Pump Station. Under this flow condition, 6.67 MG would be diverted to the North Pump Station.

The peak hourly wet weather flow rate of 24.36 MGD exceeds the combined design capacity of the Northwest and North Pump Station. Under these flow conditions it would be necessary to use the storage lagoons at the North Pump Station to reduce the peak hourly flows to levels capable of being accommodated by the two pump stations.

TABLE 14

NORTHWEST PUMP STATION
DESIGN FLOWS

ANTICIPATED ACTUAL FLOWS:

CONTRIBUTING AREA	AVERAGE DAILY DRY WEATHER FLOW (MG)	DAILY WET WEATHER FLOW PEAKING FACTOR	DAILY WET WEATHER FLOW DAILY FLOW (MG)	PEAK HOURLY WET WEATHER FLOW PEAKING FACTOR	PEAK HOURLY WET WEATHER FLOW PEAK HOUR FLOW (MGD)
ECSQ Site	1.00	1.88	1.88	2.65	2.65
City of Warrenville	1.74	1.88	3.27	2.65	4.61
City of Naperville					
-N.I. Gas, Bell Lab & Nalco Corp.	0.59	1.88	1.11	2.65	1.56
-24" McDowell Road Trunk Sewer Service Area	2.00	1.88	3.76	2.65	5.30
-Brookdale Subdivision	0.27	1.88	0.51	2.65	0.72
-N. Aurora Road Service Area	0.09	1.88	0.17	2.65	0.24
Total	5.69		10.70		15.08

THEORETICAL MAXIMUM FLOWS:

CONTRIBUTING AREA	AVERAGE DAILY DRY WEATHER FLOW (MG)	DAILY WET WEATHER FLOW PEAKING** FACTOR	DAILY WET WEATHER FLOW DAILY FLOW (MG)	PEAK HOURLY WET WEATHER FLOW PEAKING** FACTOR	PEAK HOURLY WET WEATHER FLOW PEAK HOUR FLOW (MGD)
ECSQ Site	1.40	2.50	3.50	4.00	5.60
City of Warrenville	1.74	2.50	4.35	4.00	6.96
City of Naperville					
-N.I. Gas, Bell Lab & Nalco Corp.	0.59	2.50	1.48	4.00	2.36
-24" McDowell Road Trunk Sewer Service Area	2.00	2.50	5.00	4.00	8.00
-Brookdale Subdivision	0.27	2.50	0.68	4.00	1.08
-N. Aurora Road Service Area	0.09	2.50	0.23	4.00	0.36
Total	6.09		15.24		24.36

E. Springbrook Interceptor Sewer

1) Projected Design Flows

Flow to the Springbrook Interceptor Sewer includes wastewater received from the Northwest and North Pump Stations and wastewater flows from existing developments south of Aurora Avenue and west of Naperville-Plainfield Road. The projected flow into the 42" diameter interceptor sewer from the service area north of Oswego Road is equal to the combined pumping capacity of the Northwest and North Pump Stations. At the north end of the Springbrook Interceptor Sewer the combined pumping rate of the two stations is 19.51 MGD.

2) Capacity Analysis

The projected maximum flow rate presented above can be compared to the flowing full capacity of the Springbrook Interceptor Sewer. Table 15 shows that the 42" diameter interceptor sewer can accommodate a flow rate of 20 MGD with a maximum surcharge of 0.28 feet at Manhole No. 41. Any additional flows entering the 42" interceptor south of Manhole No. 60 appear to be quite limited and well within the reserve capacity available in the 42" Springbrook Interceptor Sewer. Confirmation of this assumption should be obtained from Mr. Poole of the City of Naperville's Water and Wastewater Utility Department.

To determine the magnitude of surcharge resulting from a 25 MGD flow rate which would account for

additional inflow to the interceptor at selected points south of Manhole No. 60, the portion of the 42" interceptor sewer between Manhole Nos. 31 and 60 was analyzed under a 25 MGD flow rate. Table 15 shows a maximum surcharge depth of 5.12 feet which occurs at Manhole No. 56.

As a "worst-case" scenario and in the event that a major new wastewater inflow source were to occur south of 75th Street, the portion of the 42" diameter interceptor sewer between Manhole Nos. 1 and 31 was analyzed under a 30 MGD flow rate. This flow rate produced a maximum surcharge of 7.80 feet above the crown of the pipe at Manhole No. 31.

TABLE 15

SPRINGBROOK INTERCEPTOR SEWER
42" DIAMETER
SURCHARGE DATA

UPSTREAM MANHOLE*	GROUND ELEVATION	MANHOLE INVERT ELEVATION	WASTEWATER SURCHARGE ELEVATION @ 20 MGD	@ 25 MGD	@ 30 MGD
56	701.04	674.97	-----	683.59(5.12)	-----
54	685.74	674.04	-----	682.42(4.88)	-----
41	689.05	667.35	671.13(0.28)	-----	
31	677.62	655.82	-----	-----	667.12(7.80)
19	669.88	649.58	639.19(0.11)	-----	-----

*Manholes shown in Table 15 relate to the critical sewer segments referred to in Section V-B-1. See Appendix C for calculation of surcharge depth.

F. Springbrook Regional Water Reclamation Center

The impact of increased wastewater flows to the Springbrook treatment plant is not as significant as the impact to interceptor sewers inasmuchas the treatment plant, unlike interceptor sewers, can be expanded. As stated before, the addition of average daily dry weather flows ranging from 0.900 MG to 1.40 MG and daily wet

weather flows between 2.25 MG and 3.50 MG from the ECSQ site can be readily accommodated within the expansion potential of the Springbrook Regional Water Reclamation Center.

VII. CONCLUSION

This study was undertaken to evaluate the impact of wastewater flow originating from Elmhurst-Chicago Stone Company's Warrenville Quarry site on that portion of the interceptor sewer system of Naperville which provides service to Warrenville. Flows from the ECSQ site and other tributary areas in Warrenville and Naperville have been projected based upon existing flow data and future development plans for affected areas in the above-noted municipalities.

A. Findings

In determining the potential impact of future wastewater flows on the existing system, it was necessary to evaluate both the "anticipated-actual" and the "theoretical-maximum" (worst-case) flow conditions. Table 16 has been prepared to summarize key findings of the data and analysis presented in Section VI.

An examination of this table indicates that under "anticipated-actual" flow conditions the resulting interceptor sewer surcharges and Northwest Pump Station by-pass rates should create little, if any, operational difficulties, even during peak hourly wet weather flow conditions. If the flows actually experienced in the future reflect the anticipated flows, there would be, in our opinion, no basis for undertaking any special construction measures to attenuate peak flows.

Table 16 also summarizes the impact to the interceptor system when "theoretical-maximum" flows are imposed upon the system. Under these flow conditions, it is apparent that significant surcharges would occur during peak hourly wet weather flow conditions which could result in

TABLE 16

COMPARISON OF CRITICAL FLOW RATES AND SURCHARGE/BY-PASS*

INTERCEPTOR SYSTEM COMPONENT	DAILY DRY WEATHER FLOW	DAILY DRY WEATHER MAXIMUM SURCHARGE (FT) BY-PASS (MG)	AVERAGE DAILY WET WEATHER FLOW	AVERAGE DAILY WET WEATHER MAXIMUM SURCHARGE (FT) BY-PASS (MG)	PEAK HOURLY WET WEATHER FLOW	PEAK HOURLY WET WEATHER MAXIMUM SURCHARGE (FT) BY-PASS (MGD)	PEAK HOURLY WET WEATHER ECSO FLOW (MGD)	PEAK HOURLY WET WEATHER % OF PEAK HOURLY TOTAL
Anticipated Actual Design Flows								
River Road Interceptor								
-27" Diameter	3.33 MG	-0-	6.26 MG	0.47 ft	8.82 MGD	3.75 ft	2.52	28.6
-36" Diameter	5.60 MG	-0-	10.53 MG	0.53 ft	14.84 MGD	2.55 ft	2.52	17.0
Northwest Pump Station	5.69 MG	-0-	10.70 MG	2.13 MG	15.08 MGD	6.51 MGD	2.52	16.7
Springbrook Interceptor	19.51 MG	-0-	19.51 MG	0.53 ft	19.51 MGD	0.53 ft	2.52	12.9
Theoretical Maximum Design Flows								
River Road Sewer								
-27" Diameter	3.73 MG	-0-	9.33 MG	3.75 ft	14.92 MGD	15.99 ft	5.60	37.5
-36" Diameter	6.00 MG	-0-	15.01 MG	2.55 ft	24.00 MGD	13.88 ft	5.60	23.3
Northwest Pump Station	6.09 MG	-0-	15.24 MG	6.67 MG	24.36 MGD	15.79 MGD	5.60	23.0
Springbrook Sewers	19.51 MG	-0-	25.00 MG	5.12 ft	25.00 MGD	5.12 ft	5.60	22.4

*Surcharge/By-pass refers to depth of surcharge in interceptor sewers or the rate of flow by-passing the NW Pump Station.

sewage backups in the connecting sewers. Accordingly, the "theoretical-maximum" peak hour, wet weather flow condition, if realized, would require additional flow capacity to the system or implementation of a method to reduce peak flows.

Adding capacity to the system by constructing new sewers can be costly and disruptive to surrounding infrastructure. In a situation where the interceptor sewer capacity is essentially fixed unless new piping is installed, it is more preferable to employ a method whereby peak flows can be attenuated.

B. Flow Attenuation

If the theoretical, wet weather peak hour flow condition was realized, an appropriate method for reducing peak flows in this particular situation would be to provide wastewater storage facilities which temporarily detain the wastewater until peak flow rates subside. The detained wastewater is then released into the interceptor sewers during non-peak periods. The flow data provided by Warrenville and Naperville demonstrate that daily peak flow periods generally occur between 7:30 a.m. and 9:30 a.m. and 7:00 p.m. and 9:00 p.m. With respect to rainfall-influenced peak rates it is obvious that peak flow due to rainfall can occur at any point in the day. If wastewater flows were to be temporarily detained in a holding basin and discharged during the low-flow or non-rainfall influenced periods of the day, the effective capacity of the system would be increased. (Currently, this temporary detainage of excessive peak flows takes place at the North Pump Station through the use of the storage lagoons along the river.)

If ECSQ's peak hourly flows are compared to total flow in the interceptor system, it is apparent that, during "theoretical-maximum" peak hourly flow periods, the temporary interruption of flow from the ECSQ site would reduce, but not totally eliminate, interceptor system surcharges and pump station by-passes (See Table 16). Total elimination of surcharges during "theoretical-maximum" flow conditions would require the construction of a holding basin diverting flow from Naperville and Warrenville tributary areas to the River Road interceptor, not just the ECSQ site. Given the small probability that the theoretical flows projected herein will ever occur, it should not be necessary to construct a holding basin until such time as flow rates in the interceptor sewer system exceed the capacity of the system.

Total ultimate flow from the ECSQ site and the remainder of future development areas in Naperville will not occur for a number of years. The opportunity for Naperville to carefully monitor flow at critical points throughout the interceptor system by means of the ADS flow measurement stations will permit an on-going and accurate evaluation of wastewater flow in the system. The ability to monitor daily dry, daily wet and peak hourly wet weather conditions will allow Naperville to develop correlation factors between area-wide development and actual wastewater flow. This information will permit accurate forecasting of long-term interceptor sewer capacity demands.

C. Recommendations

Based on the findings of this study we do not recommend construction of a wastewater holding basin on the ECSQ

site at the on-set of development for the following reasons:

First, the actual flow in the system after total development of the service areas will probably not reach a flow rate which exceeds the functional capacity of the interceptor system.

Second, flow measurement will permit on-going monitoring and comparison of wastewater flow rates and system capacity. This monitoring activity will serve as an early warning system which will provide adequate advance notice to increase system capacity.

Third, it is highly unlikely that the "theoretical-maximum" flows projected herein will become actual flow rates experienced by the system. If a specific segment of the Naperville system experiences capacity problems, then it may be more desirable and cost effective to increase the capacity of this specific segment rather than constructing a holding basin. If it proves to be unfeasible to increase the capacity of a part of the interceptor system, a holding basin can always be utilized as a means of increasing system capacity assuming that some land area has been set aside for this use.

We recommend that the following conditions be made part of an amended intergovernmental agreement between Warrenville and Naperville to allow for the inclusion of Elmhurst-Chicago Stone Quarry wastewater flows into Naperville's interceptor sewer and treatment system.

First, construction of a new pump station and force main discharging from the ECSQ site to the 27" diameter River Road Interceptor Sewer should include an ADS flow measurement station not only for Naperville's billing purposes but also for the monitoring of peaking factors associated with wastewater flow discharged from the ECSQ property.

Second, a permanent flow measurement station should be installed at the proposed Northwest Pump Station to accurately determine wastewater flows and peaking factors associated with the River Road Interceptor Sewer tributary areas in Naperville west of River Road. This flow could be determined by subtracting flow measurements at the Warrenville Measuring Station and ECSQ Measuring Station from a measuring station located at the Northwest Pumping Station. The purpose for this level of flow monitorization is to accurately determine the peaking factors associated with each of the three major tributary areas to the NW Pump Station (Warrenville, ECSQ and Northwest Naperville).

Third, if at any point, during or after full development of the areas tributary to Naperville's interceptor sewer system, wastewater flows exceed functional pipe capacities, a holding basin could be installed on the ECSQ site. Based upon our understanding of allowable surcharge depths we believe this holding basin would have to be installed when the peak hourly wet weather flows in the 27" diameter interceptor sewer consistently reach or exceed flows in the range of 11 to 13 MGD.

Fourth, the size of the holding basin should be determined when more detailed flow monitoring data is available. The size of the basin will be influenced by the percentage of the service area which has been fully developed and by the length of time peak flows exceed the interceptor sewer and pumping station capacity. Based upon the flow data received from Naperville and Warrenville it appears that the average duration that wet weather peak flows would exceed the capacity of the interceptor system is approximately three to four hours. If ECSQ flow was totally withheld during this period of time and then released after the flow rate in the 27" diameter sewer declined to less than 9 MGD, the required holding basin volume would range between 150,000 gallons and 240,000 gallons depending on the size of the ECSQ development. Given the unpredictable nature of wet weather conditions it would be good engineering practice, in our opinion, to design the holding basin with some factor of safety for size to account for variations in the rate and amount of flow which may occur at any point during the day. This factor can be more knowledgeably selected after a longer period has elapsed for data collection and analysis.

Fifth, an area on the ECSQ site adjacent to the proposed pumping station should be reserved on the ECSQ land plan. This area would be available for construction of a wastewater holding basin if it is required in the future. Since the holding basin would most likely consist of a buried tank(s) in the vicinity of the pump station, the area reserved

for the basin could also serve as part of open space or walkway areas planned for the development.

Sixth, for purposes of projecting capacity demands at the Springbrook Regional Water Reclamation Center, a daily dry weather flow from the ECSQ site at full development should be assumed to be 1,000,000 gallons.

D. Summary

In conclusion, it is our opinion that the Naperville Interceptor Sewer system has adequate capacity to accept flows from the ECSQ site as well as all other service areas currently tributary to the River Road Interceptor Sewer for the foreseeable future. In the event that future flows begin to approach or exceed interceptor sewer capacity, the system capacity can be increased by construction of a wastewater holding facility to temporarily detain flow originating from the ECSQ site. The facility should not, in our opinion, be designed or constructed until the magnitude of excess wastewater flow, if any, can be more accurately projected.

The Springbrook Treatment Plant can be expanded as part of an on-going capacity increase process to accept the wastewater flow generated by development of the Elmhurst-Chicago Stone Quarry.

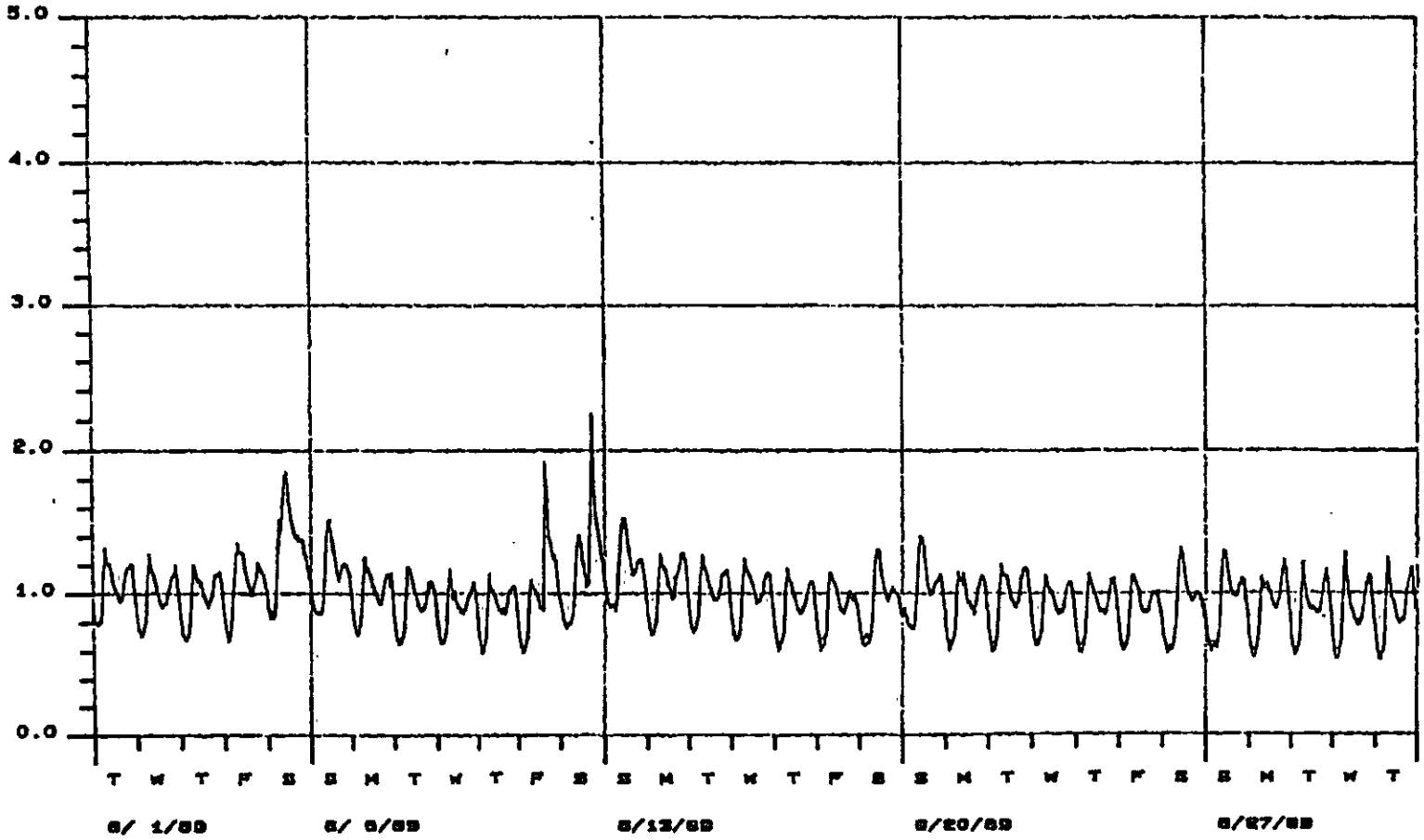
APPENDIX A

SAMPLE WMS FLOW MEASUREMENT DATA

CITY OF NAPERVILLE

WMS

AUGUST, 1990 DATA



1.041 +
0.985 +
0.974 +
1.067 +
1.333 +
1.126 +
1.002 +
0.933 +
0.906 +
0.835 +
1.037 +
1.155 +
1.159 +
1.045 +
1.008 +
0.978 +
0.910 +
0.894 +
0.937 +
1.020 +
0.934 +
0.958 +
0.900 +
0.895 +
0.888 +
0.904 +
0.926 +
0.925 +
0.891 +
0.863 +
0.880 +
30.410 *

09-25-89 15:42:41

Sensor: MAN VM

M11

'89

SITEID : WMS PIPE DIAMETER : 27.000 BASIN : 2281 RIVER RD.
ID 1 : DIAMETER = 27.00 INCHES PIPE SHAPE : CIRCULAR RAIN GAUGE:
ID 2 : CITY OF WARRENVILLE NW FLOW ENERGY GRADIENT : 3.157 SLOPE/FT MUD: 0.0

	TUESDAY AUG 1,1989		WEDNESDAY AUG 2,1989		THURSDAY AUG 3,1989		FRIDAY AUG 4,1989		SATURDAY AUG 5,1989		SUNDAY AUG 6,1989		MONDAY AUG 7,1989	
	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD
0:00:00	6.9		6.7		6.7		6.5		6.9		7.2		6.0	
:15:00	6.8		6.6		6.5		6.5		6.7		7.2		6.6	
:30:00	6.7		6.3		6.3		6.3		6.6		7.1		6.5	
:45:00	6.6	0.919	6.3	0.849	6.2	0.837	6.1	0.819	6.6	0.936	7.0	1.030	6.4	0.877
1:00:00	6.4		6.1		6.1		6.1		6.5		6.9		6.3	
:15:00	6.4		6.1		6.0		5.9		6.5		6.9		6.3	
:30:00	6.3		6.0		5.9		5.8		6.5		6.8		6.2	
:45:00	6.3	0.816	6.0	0.749	5.8	0.719	5.8	0.712	6.5	0.859	6.7	0.949	6.1	0.782
2:00:00	6.2		5.9		5.8		5.8		6.5		6.7		6.0	
:15:00	6.2		5.9		5.8		5.8		6.6		6.6		6.0	
:30:00	6.2		5.9		5.8		5.7		6.6		6.5		6.0	
:45:00	6.1	0.782	5.8	0.705	5.7	0.680	5.7	0.671	6.6	0.874	6.5	0.877	5.9	0.726
3:00:00	6.1		5.9		5.7		5.7		6.6		6.5		5.9	
:15:00	6.2		5.9		5.7		5.8		6.5		6.5		5.9	
:30:00	6.3		6.0		5.7		5.9		6.5		6.5		5.9	
:45:00	6.3	0.784	6.0	0.715	5.8	0.677	5.9	0.691	6.6	0.869	6.6	0.867	6.0	0.717
4:00:00	6.2		6.0		5.9		6.2		6.6		6.5		6.1	
:15:00	6.3		6.2		5.9		6.4		6.5		6.6		6.2	
:30:00	6.3		6.1		5.9		6.5		6.7		6.5		6.2	
:45:00	6.3	0.826	6.2	0.765	5.9	0.712	6.7	0.847	7.0	0.909	6.5	0.867	6.2	0.775
5:00:00	6.4		6.2		6.0		7.1		7.2		6.5		6.4	
:15:00	6.5		6.3		6.1		7.4		7.6		6.5		6.5	
:30:00	6.7		6.5		6.3		7.4		8.3		6.5		6.6	
:45:00	6.8	0.685	6.7	0.632	6.5	0.707	7.5	1.095	8.8	1.288	6.5	0.861	6.7	0.662
6:00:00	7.1		7.0		6.8		7.6		8.9		6.5		7.0	
:15:00	7.4		7.2		7.0		7.8		8.9		6.5		7.1	
:30:00	7.8		7.4		7.2		7.9		8.5		6.5		7.4	
:45:00	8.0	1.154	7.7	1.092	7.4	1.017	8.1	1.242	8.5	1.519	6.6	0.867	7.6	1.054
7:00:00	8.0		7.9		7.6		8.1		8.4		6.6		7.8	
:15:00	8.3		8.0		7.8		8.2		8.5		6.7		8.0	
:30:00	8.1		8.1		7.8		8.3		8.5		6.9		7.9	
:45:00	8.2	1.315	8.0	1.204	7.7	1.280	8.2	1.353	8.7	1.449	7.0	0.948	7.8	1.245
8:00:00	7.9		7.9		7.6		8.1		8.7		7.2		7.8	
:15:00	7.7		7.6		7.6		8.0		9.0		7.4		7.6	
:30:00	7.7		7.5		7.5		8.0		9.3		7.6		7.6	
:45:00	7.8	1.212	7.5	1.176	7.4	1.150	7.9	1.287	9.4	1.643	7.9	1.145	7.6	1.182
9:00:00	7.8		7.5		7.3		7.9		9.4		8.1		7.6	
:15:00	7.9		7.6		7.4		8.0		9.7		8.4		7.6	
:30:00	7.8		7.5		7.3		8.1		9.6		8.4		7.6	
:45:00	7.6	1.212	7.4	1.135	7.2	1.084	8.0	1.290	9.6	1.822	8.6	1.408	7.6	1.170
10:00:00	7.6		7.4		7.3		7.9		9.6		8.7		7.5	
:15:00	7.6		7.4		7.4		8.1		9.8		8.6		7.5	
:30:00	7.6		7.4		7.4		7.9		9.6		8.7		7.5	
:45:00	7.5	1.162	7.3	1.092	7.4	1.095	7.9	1.269	9.5	1.649	8.7	1.389	7.4	1.129
11:00:00	7.4		7.2		7.4		7.8		9.4		8.8		7.4	
:15:00	7.3		7.1		7.3		7.7		9.4		8.8		7.4	
:30:00	7.4		7.0		7.3		7.5		9.4		8.7		7.4	
:45:00	7.2	1.069	7.0	1.016	7.2	1.072	7.6	1.173	9.2	1.741	8.5	1.519	7.3	1.092

	TUESDAY AUG 1,1989		WEDNESDAY AUG 2,1989		THURSDAY AUG 3,1989		FRIDAY AUG 4,1989		SATURDAY AUG 5,1989		SUNDAY AUG 6,1989		MONDAY AUG 7,1989	
	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD
12:00:00	7.2		7.0		7.1		7.5		9.1		8.4		7.2	
:15:00	7.1		6.9		7.0		7.5		9.0		8.3		7.2	
:30:00	7.2		6.9		7.0		7.3		8.8		8.3		7.3	
:45:00	7.2	1.044	7.0	0.982	7.0	1.002	7.3	1.109	8.8	1.589	8.2	1.368	7.2	1.052
13:00:00	7.2		6.9		7.0		7.3		8.7		8.1		7.1	
:15:00	7.0		6.5		7.0		7.3		8.6		8.1		7.0	
:30:00	7.1		6.8		7.0		7.3		8.7		8.0		7.0	
:45:00	7.0	1.019	6.7	0.932	6.9	0.986	7.2	1.072	8.6	1.502	8.0	1.293	7.0	1.028
14:00:00	7.0		6.8		6.9		7.3		8.5		7.9		7.1	
:15:00	7.0		6.7		6.8		7.2		8.6		7.8		7.0	
:30:00	7.0		6.7		6.8		7.0		8.4		7.8		7.0	
:45:00	7.0	0.985	6.8	0.913	6.8	0.940	7.1	1.033	8.3	1.439	7.7	1.224	6.9	0.989
15:00:00	6.9		6.7		6.7		7.1		8.3		7.6		6.8	
:15:00	6.9		6.7		6.8		7.1		8.4		7.6		6.7	
:30:00	6.9		6.8		6.7		7.1		8.3		7.6		6.8	
:45:00	6.9	0.956	6.9	0.929	6.9	0.926	7.0	1.013	8.3	1.400	7.5	1.153	6.8	0.932
16:00:00	6.9		6.7		6.9		7.2		8.4		7.4		6.8	
:15:00	6.9		6.7		7.0		7.2		8.5		7.4		6.7	
:30:00	7.0		6.9		6.9		7.4		8.4		7.3		6.9	
:45:00	7.0	0.972	6.9	0.934	6.9	0.961	7.3	1.064	8.3	1.413	7.4	1.098	6.9	0.942
17:00:00	7.0		6.9		6.9		7.2		8.3		7.4		6.9	
:15:00	7.2		7.0		6.9		7.4		8.2		7.4		7.0	
:30:00	7.3		7.1		7.0		7.4		8.1		7.5		7.0	
:45:00	7.3	1.050	7.2	1.005	7.1	0.980	7.6	1.169	8.3	1.362	7.6	1.135	7.0	0.991
18:00:00	7.3		7.2		7.3		7.8		8.2		7.6		7.1	
:15:00	7.5		7.2		7.4		7.8		8.3		7.7		7.2	
:30:00	7.6		7.2		7.5		7.8		8.3		7.7		7.4	
:45:00	7.6	1.133	7.2	1.058	7.4	1.101	7.7	1.212	8.3	1.375	7.7	1.191	7.5	1.073
19:00:00	7.7		7.4		7.4		7.8		8.4		7.8		7.5	
:15:00	7.6		7.4		7.4		7.7		8.4		7.6		7.4	
:30:00	7.6		7.4		7.5		7.6		8.2		7.8		7.4	
:45:00	7.6	1.176	7.4	1.109	7.4	1.121	7.5	1.173	8.1	1.378	7.7	1.203	7.5	1.118
20:00:00	7.6		7.4		7.5		7.5		8.1		7.6		7.6	
:15:00	7.7		7.4		7.4		7.6		8.0		7.7		7.4	
:30:00	7.6		7.5		7.5		7.5		8.0		7.7		7.5	
:45:00	7.7	1.179	7.4	1.121	7.5	1.129	7.6	1.147	8.0	1.281	7.7	1.188	7.4	1.127
21:00:00	7.8		7.6		7.4		7.6		7.9		7.5		7.4	
:15:00	7.7		7.8		7.6		7.5		7.9		7.6		7.3	
:30:00	7.8		7.7		7.6		7.5		7.8		7.6		7.3	
:45:00	7.6	1.205	7.6	1.179	7.6	1.150	7.4	1.132	7.9	1.242	7.6	1.156	7.3	1.094
22:00:00	7.5		7.6		7.5		7.4		7.8		7.6		7.4	
:15:00	7.6		7.4		7.4		7.4		7.6		7.5		7.7	
:30:00	7.4		7.4		7.2		7.2		7.6		7.4		7.6	
:45:00	7.3	1.133	7.2	1.104	7.1	1.075	7.2	1.084	7.5	1.176	7.4	1.129	7.3	1.136
23:00:00	7.2		7.1		7.1		7.2		7.5		7.3		7.2	
:15:00	7.2		7.0		7.0		7.2		7.5		7.1		7.0	
:30:00	7.0		6.8		6.9		7.0		7.4		7.0		6.9	
:45:00	6.8	1.000	6.7	0.967	6.7	0.978	6.9	1.019	7.4	1.115	6.9	1.022	6.8	0.956
TOTAL FLOW		1.041		0.985		0.974		1.067		1.333		1.126		1.032
MINIMUMS	2:45:00	0.767	2:45:00	0.691	2:45:00	0.673	2:45:00	0.655	1:00:00	0.846	3:30:00	0.856	2:45:00	0.710
AM'NINS	2:45:00	0.767	2:45:00	0.691	2:45:00	0.673	2:45:00	0.655	1:00:00	0.546	3:30:00	0.856	2:45:00	0.710
MAXIMUMS	7:15:00	1.372	7:30:00	1.306	7:15:00	1.236	7:30:00	1.384	10:15:00	1.893	11:00:00	1.555	7:15:00	1.272

Sensor : MAN Time of Report : 09-26-89 13:31:28 Flow Average for week : 1.075 Total Flow for week: 7.528

C I T Y O F N A P E R V I L L E Q U A D R A S C A N

NO: 2

SITEID : WNS
ID 1 : DIAMETER = 27.00 INCHES
ID 2 : CITY OF WARRENVILLE NW FLOW

PIPE DIAMETER : 27.000
PIPE SHAPE : CIRCULAR
ENERGY GRADIENT : 3.157 SQRT(S)/N

BASIN : 2001 RIVER RD.
RAIN GAUGE:
MUD: 0.0

	TUESDAY AUG 8,1989		WEDNESDAY AUG 9,1989		THURSDAY AUG 10,1989		FRIDAY AUG 11,1989		SATURDAY AUG 12,1989		SUNDAY AUG 13,1989		MONDAY AUG 14,1989	
	RN DEPTH	MUD	RN DEPTH	MUD	RN DEPTH	MUD	RN DEPTH	MUD	RN DEPTH	MUD	RN DEPTH	MUD	RN DEPTH	MUD
0:00:00	6.5		6.5		6.3		6.2		6.7		7.5		6.6	
:15:00	6.3		6.3		6.2		6.1		6.7		7.4		6.5	
:30:00	6.2		6.1		6.0		6.0		6.7		7.2		6.4	
:45:00	6.3	0.794	6.1	0.792	5.9	0.751	5.8	0.743	6.6	0.985	7.2	1.081	6.3	0.842
1:00:00	5.9		5.9		5.7		5.8		6.5		7.1		6.1	
:15:00	5.8		5.8		5.7		5.7		6.4		7.0		6.1	
:30:00	5.7		5.8		5.6		5.6		6.4		7.0		6.1	
:45:00	5.7	0.687	5.7	0.667	5.6	0.653	5.5	0.649	6.3	0.821	6.9	0.954	6.1	0.768
2:00:00	5.7		5.7		5.4		5.5		6.3		6.9		6.0	
:15:00	5.7		5.6		5.4		5.4		6.2		6.9		5.9	
:30:00	5.6		5.7		5.4		5.4		6.2		6.7		5.9	
:45:00	5.5	0.646	5.7	0.655	5.4	0.589	5.3	0.593	6.1	0.779	6.8	0.937	5.9	0.712
3:00:00	5.6		5.7		5.4		5.3		6.1		6.7		5.9	
:15:00	5.7		5.7		5.3		5.4		6.1		6.7		5.9	
:30:00	5.7		5.7		5.4		5.4		6.1		6.7		5.9	
:45:00	5.7	0.655	5.7	0.662	5.5	0.589	5.4	0.591	6.1	0.760	6.7	0.916	6.1	0.727
4:00:00	5.8		5.7		5.6		5.4		6.2		6.8		6.1	
:15:00	5.9		5.9		5.6		5.7		6.2		6.7		6.2	
:30:00	5.8		5.9		5.6		5.7		6.2		6.6		6.2	
:45:00	5.9	0.696	5.9	0.696	5.6	0.646	5.6	0.639	6.2	0.784	6.7	0.913	6.2	0.779
5:00:00	5.9		5.9		5.7		5.7		6.2		6.7		6.3	
:15:00	6.1		6.1		5.8		5.8		6.2		6.8		6.3	
:30:00	6.2		6.1		5.9		5.9		6.2		6.7		6.5	
:45:00	6.3	0.763	6.3	0.758	6.1	0.708	6.0	0.699	6.3	0.789	6.7	0.913	6.6	0.839
6:00:00	6.7		6.6		6.3		6.2		6.3		6.7		7.0	
:15:00	6.9		6.8		6.7		6.5		6.3		6.7		7.2	
:30:00	7.1		7.1		7.0		6.7		6.4		6.7		7.4	
:45:00	7.5	1.087	7.2	0.973	7.1	0.931	7.0	0.891	6.4	0.814	6.7	0.908	7.6	1.279
7:00:00	7.5		7.4		7.3		7.0		6.4		6.8		7.7	
:15:00	7.6		7.7		7.6		7.4		6.6		6.9		7.9	
:30:00	7.8		7.6		7.6		7.5		6.8		7.0		8.0	
:45:00	7.7	1.179	7.6	1.165	7.5	1.138	7.4	1.090	7.0	0.909	7.2	0.992	8.0	1.257
8:00:00	7.6		7.6		7.2		7.3		7.0		7.4		7.8	
:15:00	7.6		7.4		7.2		7.2		7.3		7.6		7.7	
:30:00	7.6		7.2		7.0		7.2		7.6		8.1		7.6	
:45:00	7.5	1.159	7.0	1.073	7.0	1.022	7.1	1.247	7.9	1.120	8.2	1.238	7.8	1.220
9:00:00	7.5		6.9		7.0		7.1		8.1		8.5		7.7	
:15:00	7.4		6.8		7.1		7.1		8.2		8.4		7.7	
:30:00	7.5		6.9		7.1		7.2		8.3		8.5		7.7	
:45:00	7.4	1.113	7.0	0.969	7.1	1.019	7.1	1.022	8.3	1.356	8.6	1.449	7.7	1.151
10:00:00	7.2		7.1		7.0		7.1		8.3		8.7		7.7	
:15:00	7.2		7.1		7.0		7.0		8.3		8.8		7.6	
:30:00	7.2		7.1		7.0		7.1		8.4		8.7		7.6	
:45:00	7.2	1.052	7.0	1.016	6.9	0.994	7.0	1.013	8.5	1.407	8.7	1.522	7.4	1.162
11:00:00	7.1		7.0		6.8		6.9		8.3		8.8		7.4	
:15:00	7.0		6.9		6.9		6.9		8.2		8.8		7.4	
:30:00	7.1		6.8		6.6		6.9		8.2		8.6		7.4	
:45:00	7.1	1.013	6.8	0.958	6.7	0.934	6.9	0.967	8.1	1.349	8.6	1.519	7.3	1.095

	TUESDAY AUG 8,1989		WEDNESDAY AUG 9,1989		THURSDAY AUG 10,1989		FRIDAY AUG 11,1989		SATURDAY AUG 12,1989		SUNDAY AUG 13,1989		MONDAY AUG 14,1989	
	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD
12:00:00	7.1		6.9		6.7		6.2		8.0		8.6		7.3	
:15:00	6.9		6.3		6.7		6.7		7.8		8.5		7.3	
:30:00	6.9		6.7		6.7		6.6		7.7		8.5		7.2	
:45:00	6.9	0.980	6.7	0.929	6.7	0.935	6.7	0.903	7.6	1.218	8.3	1.446	7.3	1.069
13:00:00	6.9		6.7		6.7		6.7		7.6		8.3		7.1	
:15:00	6.7		6.7		6.7		6.7		7.6		8.1		7.2	
:30:00	6.8		6.7		6.6		6.7		7.4		8.0		7.1	
:45:00	6.7	0.926	6.7	0.903	6.5	0.890	6.6	0.920	7.4	1.133	8.1	1.328	7.0	1.016
14:00:00	6.6		6.7		6.5		6.7		7.3		7.9		6.9	
:15:00	6.5		6.5		6.5		6.6		7.1		7.8		6.9	
:30:00	6.7		6.5		6.5		6.5		7.1		8.0		6.9	
:45:00	6.7	0.897	6.5	0.859	6.5	0.859	6.7	0.955	7.2	1.047	7.9	1.237	6.9	0.967
15:00:00	6.6		6.4		6.6		8.5		7.3		7.7		6.9	
:15:00	6.5		6.5		6.6		9.7		7.3		7.6		6.9	
:30:00	6.6		6.5		6.5		10.6		7.2		7.6		7.1	
:45:00	6.6	0.880	6.6	0.862	6.5	0.872	10.4	1.921	7.2	1.067	7.6	1.173	7.0	0.987
16:00:00	6.5		6.5		6.5		10.0		7.5		7.6		7.2	
:15:00	6.5		6.6		6.5		9.7		8.3		7.5		7.4	
:30:00	6.7		6.6		6.6		9.3		9.1		7.5		7.6	
:45:00	6.9	0.890	6.7	0.882	6.5	0.864	9.0	1.787	10.0	1.533	7.5	1.144	7.5	1.115
17:00:00	6.7		6.7		6.7		9.5		10.9		7.6		7.5	
:15:00	6.7		6.7		6.7		8.4		10.9		7.5		7.5	
:30:00	6.8		6.8		6.6		8.2		10.6		7.5		7.5	
:45:00	6.8	0.926	6.9	0.926	6.8	0.921	8.4	1.407	10.4	2.244	7.7	1.153	7.6	1.141
18:00:00	6.9		6.8		6.9		8.3		9.0		7.8		7.6	
:15:00	6.9		6.9		7.0		8.3		9.4		7.7		7.7	
:30:00	7.0		6.9		7.0		8.2		9.3		7.7		7.8	
:45:00	7.1	0.991	6.9	0.951	7.0	0.980	8.0	1.356	9.2	1.774	7.8	1.226	7.8	1.194
19:00:00	7.3		7.0		7.0		8.0		8.9		7.9		7.8	
:15:00	7.2		7.0		7.3		8.0		8.8		7.7		7.9	
:30:00	7.2		7.1		7.3		8.0		8.6		7.8		8.0	
:45:00	7.3	1.067	7.0	0.997	7.1	1.085	7.9	1.269	8.6	1.542	7.9	1.227	8.0	1.263
20:00:00	7.4		7.0		7.0		7.8		8.7		7.9		8.0	
:15:00	7.3		7.1		7.1		7.8		8.6		7.8		7.9	
:30:00	7.3		7.2		7.2		7.9		8.4		7.7		8.0	
:45:00	7.3	1.081	7.2	1.038	7.3	1.041	7.9	1.241	8.4	1.463	7.8	1.224	8.0	1.273
21:00:00	7.3		7.4		7.3		7.9		8.4		7.8		7.8	
:15:00	7.2		7.4		7.2		7.8		8.4		7.7		7.9	
:30:00	7.2		7.3		7.2		7.8		8.3		7.6		7.8	
:45:00	7.1	1.041	7.2	1.075	7.1	1.047	7.6	1.218	8.2	1.391	7.6	1.177	7.8	1.235
22:00:00	7.2		7.2		7.1		7.4		8.1		7.6		7.7	
:15:00	7.1		7.0		7.0		7.4		8.0		7.4		7.6	
:30:00	7.0		6.9		7.2		7.2		7.9		7.4		7.6	
:45:00	7.0	1.025	6.9	0.906	7.0	1.013	7.2	1.025	7.8	1.272	7.3	1.118	7.5	1.170
23:00:00	7.0		6.8		6.8		7.1		7.8		7.1		7.2	
:15:00	6.3		6.7		6.7		7.0		7.7		7.1		7.2	
:30:00	6.7		6.7		6.5		6.9		7.7		7.0		6.9	
:45:00	6.6	0.929	6.5	0.903	6.3	0.880	6.9	0.975	7.5	1.185	6.9	0.989	6.7	0.995
TOTAL FLOW		0.933		0.906		0.885		1.037		1.195		1.159		1.045
MINIMUMS	2:45:00	0.619	2:15:00	0.646	3:15:00	0.576	2:45:00	0.576	3:15:00	0.748	4:30:00	0.867	2:30:00	0.720
AM MINS	2:45:00	0.619	2:15:00	0.646	3:15:00	0.576	2:45:00	0.576	3:15:00	0.748	4:30:00	0.867	2:30:00	0.720
MAXIMUMS	7:30:00	1.212	7:15:00	1.228	7:30:00	1.176	15:30:00	2.196	17:00:00	2.323	11:00:00	1.555	20:00:00	1.296

Sensor : MAN Time of Report : 09-26-89 13:31:49 Flow Average for week : 1.023 Total Flow for week: 7.160

C I T Y O F N A P E R V I L L E Q U A D R A S C A N

NO: 3

SITEID : WMS
ID 1 : DIAMETER = 27.00 INCHES
ID 2 : CITY OF NAPERVILLE WW FLOW

PIPE DIAMETER : 27.000
PIPE SHAPE : CIRCULAR
ENERGY GRADIENT : 3.137 SQRT(S)/N

BASIN : 2001 RIVER RD.
RAIN GAUGE:
MUD: 0.0

	TUESDAY AUG 15,1989		WEDNESDAY AUG 16,1989		THURSDAY AUG 17,1989		FRIDAY AUG 18,1989		SATURDAY AUG 19,1989		SUNDAY AUG 20,1989		MONDAY AUG 21,1989	
	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD
0:00:00	6.7		6.5		6.4		6.3		6.4		6.4		6.5	
:15:00	6.5		6.5		6.2		6.1		6.3		6.4		6.2	
:30:00	6.5		6.3		6.1		6.0		6.1		6.4		6.1	
:45:00	6.4	0.839	6.1	0.822	5.9	0.773	6.0	0.758	6.0	0.750	6.5	0.839	6.1	0.787
1:00:00	6.3		6.1		5.8		5.9		5.9		6.6		5.9	
:15:00	6.1		6.0		5.7		5.6		5.9		6.7		5.8	
:30:00	6.1		5.9		5.6		5.7		5.7		6.7		5.7	
:45:00	6.1	0.765	5.8	0.722	5.6	0.659	5.6	0.671	5.7	0.667	6.7	0.895	5.6	0.671
2:00:00	6.0		5.8		5.5		5.5		5.7		6.6		5.5	
:15:00	6.0		5.8		5.4		5.5		5.7		6.5		5.5	
:30:00	6.0		5.7		5.4		5.4		5.6		6.4		5.4	
:45:00	6.0	0.736	5.7	0.677	5.4	0.606	5.4	0.626	5.5	0.644	6.3	0.647	5.5	0.608
3:00:00	6.1		5.7		5.5		5.5		5.6		6.2		5.5	
:15:00	6.1		5.9		5.6		5.6		5.6		6.2		5.5	
:30:00	6.1		5.9		5.5		5.6		5.6		6.1		5.6	
:45:00	6.1	0.760	5.8	0.684	5.6	0.623	5.6	0.632	5.6	0.634	6.2	0.762	5.7	0.628
4:00:00	6.1		5.9		5.7		5.6		5.6		6.2		5.7	
:15:00	6.3		5.9		5.7		5.6		5.7		6.2		5.7	
:30:00	6.3		5.9		5.8		5.7		5.7		6.1		5.9	
:45:00	6.3	0.769	6.0	0.708	5.7	0.671	5.7	0.658	5.7	0.657	6.2	0.775	5.8	0.680
5:00:00	6.3		6.1		5.8		5.8		5.6		6.2		5.9	
:15:00	6.5		6.3		5.9		5.9		5.7		6.1		5.9	
:30:00	6.5		6.5		6.0		6.0		5.7		6.1		6.1	
:45:00	6.8	0.867	6.6	0.824	6.2	0.724	6.1	0.727	5.7	0.662	6.1	0.762	6.2	0.739
6:00:00	7.0		6.8		6.5		6.4		5.7		6.1		6.5	
:15:00	7.3		7.0		6.9		6.7		5.7		6.0		6.7	
:30:00	7.6		7.3		7.0		7.0		5.8		6.1		7.0	
:45:00	7.8	1.110	7.7	1.046	7.5	0.965	7.2	0.952	5.9	0.694	6.1	0.753	7.3	0.957
7:00:00	7.9		7.7		7.6		7.2		6.1		6.2		7.4	
:15:00	8.0		8.0		7.6		7.6		6.2		6.3		7.6	
:30:00	8.0		7.9		7.6		7.6		6.3		6.3		7.7	
:45:00	7.8	1.260	7.8	1.245	7.6	1.162	7.5	1.133	6.5	0.797	6.5	0.809	7.5	1.150
8:00:00	7.8		7.6		7.5		7.4		6.9		6.8		7.4	
:15:00	7.7		7.6		7.3		7.4		7.1		6.9		7.4	
:30:00	7.7		7.6		7.2		7.4		7.2		7.2		7.3	
:45:00	7.6	1.220	7.6	1.170	7.4	1.098	7.4	1.106	7.5	1.042	7.4	1.017	7.3	1.092
9:00:00	7.6		7.5		7.4		7.3		7.7		7.8		7.4	
:15:00	7.6		7.6		7.3		7.3		8.0		7.9		7.4	
:30:00	7.5		7.5		7.2		7.4		8.0		8.1		7.3	
:45:00	7.5	1.153	7.4	1.138	7.1	1.064	7.2	1.075	8.0	1.260	8.1	1.291	7.4	1.089
10:00:00	7.5		7.5		7.1		7.3		8.0		8.3		7.5	
:15:00	7.5		7.4		7.1		7.3		8.1		8.4		7.4	
:30:00	7.4		7.4		7.1		7.2		8.0		8.4		7.5	
:45:00	7.2	1.109	7.4	1.112	7.0	1.016	7.1	1.052	8.1	1.308	8.3	1.401	7.5	1.129
11:00:00	7.2		7.4		7.0		7.1		8.2		8.4		7.3	
:15:00	7.2		7.3		7.0		7.1		8.1		8.3		7.3	
:30:00	7.1		7.2		7.0		7.1		8.0		8.3		7.2	
:45:00	7.2	1.044	7.2	1.070	6.8	0.978	6.9	1.000	7.8	1.294	8.2	1.365	7.0	1.044

	TUESDAY AUG 15,1989		WEDNESDAY AUG 16,1989		THURSDAY AUG 17,1989		FRIDAY AUG 18,1989		SATURDAY AUG 19,1989		SUNDAY AUG 20,1989		MONDAY AUG 21,1989	
	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD
12:00:00	7.2		7.2		6.8		6.9		7.7		8.2		6.9	
:15:00	7.1		7.1		6.7		6.9		7.6		8.2		6.9	
:30:00	7.1		7.2		6.5		6.8		7.5		8.0		6.9	
:45:00	7.1	1.030	7.1	1.038	6.8	0.932	6.9	0.945	7.5	1.150	7.9	1.315	6.9	0.959
13:00:00	7.1		7.2		6.7		6.7		7.4		7.8		6.8	
:15:00	7.0		7.0		6.5		6.7		7.2		7.6		6.9	
:30:00	7.0		6.9		6.6		6.6		7.3		7.5		6.8	
:45:00	7.0	0.991	6.9	0.983	6.7	0.887	6.5	0.887	7.2	1.075	7.3	1.165	6.8	0.937
14:00:00	6.9		6.9		6.6		6.6		7.3		7.4		6.7	
:15:00	6.9		6.9		6.6		6.6		7.1		7.3		6.7	
:30:00	6.9		6.8		6.5		6.5		7.0		7.2		6.9	
:45:00	6.9	0.961	6.8	0.945	6.5	0.872	6.5	0.874	7.1	1.027	7.2	1.072	6.9	0.932
15:00:00	6.9		6.8		6.5		6.5		7.1		7.1		6.7	
:15:00	6.9		6.8		6.5		6.5		7.0		7.0		6.6	
:30:00	7.0		6.9		6.5		6.5		7.0		7.0		6.7	
:45:00	6.9	0.967	6.9	0.948	6.6	0.867	6.6	0.864	6.9	0.991	7.0	0.999	6.7	0.895
16:00:00	6.9		6.9		6.7		6.7		6.9		7.0		6.6	
:15:00	6.9		7.0		6.7		6.7		6.9		7.0		6.6	
:30:00	7.0		7.0		6.7		6.6		6.9		7.0		6.6	
:45:00	6.9	0.969	6.9	0.975	6.7	0.911	6.7	0.858	6.9	0.969	7.1	0.999	6.7	0.887
17:00:00	7.0		7.0		6.8		6.8		6.9		7.2		6.8	
:15:00	6.9		7.0		6.7		6.8		6.9		7.1		6.8	
:30:00	7.2		7.0		6.7		6.9		7.0		7.0		6.9	
:45:00	7.3	1.016	7.0	0.988	6.8	0.924	6.8	0.937	7.0	0.977	7.0	1.008	6.9	0.945
18:00:00	7.3		7.1		6.9		7.0		7.1		7.1		7.0	
:15:00	7.3		7.2		7.0		6.9		7.1		7.2		7.1	
:30:00	7.4		7.4		7.0		7.0		7.2		7.2		7.1	
:45:00	7.5	1.104	7.5	1.076	7.0	0.983	7.0	0.980	7.1	1.024	7.3	1.052	7.2	1.019
19:00:00	7.5		7.4		7.1		6.9		7.2		7.4		7.3	
:15:00	7.5		7.4		7.2		6.9		7.1		7.3		7.3	
:30:00	7.4		7.4		7.2		6.9		7.1		7.3		7.3	
:45:00	7.5	1.132	7.4	1.115	7.2	1.044	6.8	0.961	7.0	1.019	7.3	1.081	7.3	1.076
20:00:00	7.6		7.4		7.2		6.9		7.0		7.3		7.4	
:15:00	7.5		7.4		7.3		6.7		7.0		7.3		7.4	
:30:00	7.5		7.5		7.3		6.9		7.0		7.4		7.5	
:45:00	7.6	1.147	7.6	1.132	7.4	1.072	6.9	0.948	7.0	0.997	7.4	1.079	7.4	1.112
21:00:00	7.6		7.6		7.4		7.0		7.1		7.4		7.4	
:15:00	7.6		7.5		7.3		7.0		7.0		7.5		7.4	
:30:00	7.6		7.4		7.2		6.9		7.0		7.5		7.4	
:45:00	7.6	1.159	7.2	1.131	7.2	1.075	6.9	0.980	6.9	0.994	7.5	1.109	7.4	1.103
22:00:00	7.5		7.1		7.1		6.9		7.0		7.4		7.3	
:15:00	7.4		7.1		7.2		6.9		6.9		7.2		7.3	
:30:00	7.4		7.0		7.0		6.9		6.8		7.2		7.1	
:45:00	7.2	1.090	7.0	1.083	7.0	1.007	6.7	0.932	6.7	0.956	7.2	1.061	7.0	1.044
23:00:00	7.1		7.0		6.8		6.7		6.6		7.0		6.9	
:15:00	7.0		6.7		6.7		6.7		6.5		6.9		6.7	
:30:00	6.9		6.7		6.5		6.5		6.4		6.8		6.7	
:45:00	6.6	0.965	6.5	0.909	6.5	0.893	6.5	0.880	6.5	0.857	6.7	0.945	6.5	0.919
TOTAL FLOW		1.080		0.978		0.910		0.894		0.937		1.020		0.924
MINIMUMS	2:45:00	0.729	2:45:00	0.664	2:15:00	0.681	2:45:00	0.593	2:45:00	0.619	6:15:00	0.738	2:30:00	0.681
AM MINS	2:45:00	0.729	2:45:00	0.664	2:15:00	0.681	2:45:00	0.593	2:45:00	0.619	6:15:00	0.738	2:30:00	0.681
MAXIMUMS	7:15:00	1.284	7:15:00	1.296	7:00:00	1.164	7:15:00	1.164	11:00:00	1.346	10:30:00	1.423	7:30:00	1.126

Sensor : MAN Time of Report : 09-06-89 13:32:10 Flow Average for week : 0.934 Total Flow for week: 6.600

CITY OF NAPERVILLE QUADRASCAN NO: 4

SITEID : NMS
ID 1 : DIAMETER = 27.00 INCHES
ID 2 : CITY OF NAPERVILLE NW FLOW

PIPE DIAMETER : 27.000
PIPE SHAPE : CIRCULAR
ENERGY GRADIENT : 3.157 SQRT(S)/N

BASIN : 2081 RIVER RD.
RAIN GAUGE:
MUD: 0.0

	TUESDAY AUG 22,1989		WEDNESDAY AUG 23,1989		THURSDAY AUG 24,1989		FRIDAY AUG 25,1989		SATURDAY AUG 26,1989		SUNDAY AUG 27,1989		MONDAY AUG 28,1989	
	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD
0:00:00	6.3		6.5		6.3		6.4		6.3		6.3		6.2	
:15:00	6.2		6.3		6.1		6.3		6.1		6.1		6.0	
:30:00	6.1		6.3		5.9		6.1		6.0		6.0		5.9	
:45:00	6.0	0.765	6.1	0.824	5.8	0.739	5.9	0.775	5.9	0.751	5.9	0.758	5.8	0.724
1:00:00	5.9		6.0		5.8		5.9		5.8		5.9		5.7	
:15:00	5.7		5.8		5.7		5.7		5.7		5.8		5.6	
:30:00	5.6		5.7		5.6		5.7		5.7		5.8		5.5	
:45:00	5.5	0.660	5.7	0.689	5.5	0.653	5.6	0.666	5.7	0.671	5.7	0.637	5.4	0.624
2:00:00	5.4		5.7		5.5		5.5		5.6		5.7		5.3	
:15:00	5.4		5.6		5.4		5.4		5.5		5.6		5.2	
:30:00	5.4		5.6		5.4		5.4		5.4		5.5		5.2	
:45:00	5.4	0.597	5.5	0.637	5.3	0.591	5.4	0.604	5.3	0.622	5.5	0.628	5.2	0.557
3:00:00	5.4		5.6		5.3		5.4		5.3		5.4		5.2	
:15:00	5.4		5.6		5.4		5.5		5.3		5.4		5.2	
:30:00	5.5		5.6		5.4		5.4		5.4		5.3		5.2	
:45:00	5.6	0.606	5.7	0.643	5.5	0.591	5.5	0.606	5.4	0.578	5.4	0.589	5.2	0.553
4:00:00	5.6		5.7		5.6		5.5		5.4		5.5		5.4	
:15:00	5.6		5.8		5.6		5.6		5.5		5.6		5.4	
:30:00	5.7		5.9		5.6		5.6		5.5		5.6		5.4	
:45:00	5.7	0.650	5.9	0.696	5.6	0.639	5.6	0.632	5.6	0.612	5.6	0.623	5.5	0.599
5:00:00	5.7		5.9		5.7		5.7		5.5		5.6		5.6	
:15:00	5.8		6.1		5.8		5.8		5.4		5.7		5.7	
:30:00	6.0		6.1		5.9		5.9		5.4		5.6		5.9	
:45:00	6.2	0.722	6.2	0.755	6.1	0.703	6.0	0.723	5.4	0.602	5.5	0.637	5.9	0.662
6:00:00	6.5		6.5		6.4		6.2		5.5		5.5		6.3	
:15:00	6.8		6.9		6.7		6.6		5.6		5.5		6.6	
:30:00	7.3		7.1		7.0		6.9		5.6		5.5		6.8	
:45:00	7.5	1.205	7.4	0.982	7.2	0.955	7.1	0.913	5.7	0.641	5.5	0.619	7.3	0.939
7:00:00	7.7		7.2		7.3		7.3		5.8		5.6		7.4	
:15:00	7.8		7.6		7.5		7.5		6.0		5.7		7.5	
:30:00	7.8		7.6		7.6		7.5		6.1		5.9		7.4	
:45:00	7.7	1.208	7.4	1.121	7.5	1.130	7.5	1.121	6.4	0.751	6.2	0.702	7.4	1.106
8:00:00	7.5		7.4		7.4		7.5		6.6		6.2		7.3	
:15:00	7.5		7.2		7.3		7.4		6.3		6.3		7.2	
:30:00	7.4		7.2		7.3		7.4		6.9		6.7		7.1	
:45:00	7.4	1.127	7.1	1.055	7.3	1.084	7.4	1.118	7.2	0.960	7.0	0.873	7.2	1.058
9:00:00	7.5		7.2		7.2		7.4		7.4		7.4		7.2	
:15:00	7.5		7.1		7.2		7.3		7.7		7.5		7.3	
:30:00	7.4		7.2		7.1		7.2		8.0		7.8		7.2	
:45:00	7.4	1.129	7.1	1.038	7.1	1.036	7.2	1.078	8.1	1.231	7.9	1.177	7.2	1.053
10:00:00	7.6		7.1		7.1		7.2		8.1		8.0		7.3	
:15:00	7.5		7.2		7.0		7.2		8.1		8.0		7.3	
:30:00	7.4		7.0		7.0		7.2		8.1		8.1		7.2	
:45:00	7.4	1.124	7.0	1.013	7.0	0.999	7.0	1.038	8.0	1.315	8.1	1.293	7.2	1.067
11:00:00	7.3		7.0		6.9		7.2		8.0		8.1		7.2	
:15:00	7.2		7.0		6.9		7.2		8.0		8.0		7.2	
:30:00	7.2		7.0		7.0		7.1		8.0		8.0		7.2	
:45:00	7.2	1.052	6.9	0.903	6.9	0.969	6.9	1.019	7.9	1.275	7.8	1.278	7.1	1.247

	TUESDAY AUG 22,1989		WEDNESDAY AUG 23,1989		THURSDAY AUG 24,1989		FRIDAY AUG 25,1989		SATURDAY AUG 26,1989		SUNDAY AUG 27,1989		MONDAY AUG 28,1989	
	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD
12:00:00	7.1		6.9		6.8		6.6		7.8		7.7		7.2	
:15:00	7.0		6.6		6.7		6.7		7.6		7.8		7.2	
:30:00	6.9		6.7		6.8		6.7		7.6		7.6		7.0	
:45:00	6.9	0.983	6.8	0.937	6.9	0.924	6.6	0.905	7.6	1.173	7.6	1.200	6.9	1.014
13:00:00	6.9		6.7		6.7		6.5		7.4		7.5		6.9	
:15:00	6.9		6.6		6.7		6.6		7.2		7.4		6.9	
:30:00	6.9		6.5		6.6		6.5		7.2		7.3		6.9	
:45:00	6.9	0.964	6.6	0.882	6.6	0.908	6.5	0.867	7.1	1.058	7.2	1.092	6.7	0.948
14:00:00	6.8		6.7		6.6		6.6		7.0		7.2		6.8	
:15:00	6.7		6.5		6.5		6.6		7.1		7.1		6.7	
:30:00	6.7		6.5		6.7		6.5		7.1		7.0		6.6	
:45:00	6.7	0.924	6.5	0.872	6.7	0.882	6.5	0.864	7.0	1.023	7.0	1.013	6.7	0.906
15:00:00	6.8		6.5		6.5		6.5		7.0		7.0		6.6	
:15:00	6.7		6.5		6.5		6.5		6.9		7.0		6.7	
:30:00	6.8		6.5		6.5		6.5		6.9		7.0		6.7	
:45:00	6.8	0.926	6.5	0.864	6.5	0.864	6.5	0.859	6.9	0.967	7.0	0.991	6.6	0.895
16:00:00	6.8		6.5		6.5		6.5		6.9		6.9		6.7	
:15:00	6.9		6.5		6.5		6.6		6.8		7.0		6.7	
:30:00	6.8		6.6		6.5		6.5		6.9		7.0		6.7	
:45:00	6.7	0.934	6.6	0.869	6.5	0.854	6.7	0.874	6.8	0.948	6.9	0.983	6.8	0.916
17:00:00	6.9		6.6		6.6		6.7		6.7		6.9		6.8	
:15:00	7.0		6.7		6.6		6.7		6.8		6.9		6.9	
:30:00	7.1		6.8		6.6		6.7		6.9		6.9		6.9	
:45:00	7.1	0.994	6.9	0.913	6.6	0.885	6.8	0.921	6.9	0.945	7.0	0.969	6.9	0.959
18:00:00	7.4		6.9		6.8		6.9		6.9		7.0		7.0	
:15:00	7.4		7.1		6.9		7.0		7.0		7.1		7.2	
:30:00	7.4		7.1		6.9		7.1		6.9		7.2		7.2	
:45:00	7.5	1.109	7.1	1.005	6.9	0.945	7.0	0.991	6.9	0.975	7.2	1.036	7.3	1.047
19:00:00	7.6		7.2		7.0		7.0		7.0		7.2		7.4	
:15:00	7.5		7.2		7.2		7.0		7.0		7.2		7.4	
:30:00	7.6		7.2		7.2		7.0		7.0		7.2		7.6	
:45:00	7.7	1.159	7.3	1.058	7.3	1.039	7.0	0.999	7.0	0.983	7.3	1.055	7.0	1.153
20:00:00	7.7		7.3		7.3		7.0		7.0		7.3		7.0	
:15:00	7.6		7.3		7.3		6.9		6.9		7.4		7.0	
:30:00	7.6		7.3		7.3		6.9		7.0		7.4		7.0	
:45:00	7.6	1.173	7.3	1.075	7.5	1.139	7.0	0.983	6.9	0.980	7.4	1.092	7.0	1.230
21:00:00	7.6		7.2		7.4		7.0		7.0		7.4		7.9	
:15:00	7.7		7.3		7.3		7.0		6.9		7.4		7.7	
:30:00	7.6		7.2		7.3		7.0		6.9		7.3		7.5	
:45:00	7.4	1.159	7.2	1.058	7.3	1.084	7.0	0.988	6.9	0.948	7.2	1.051	7.4	1.159
22:00:00	7.5		7.0		7.2		6.9		6.7		7.1		7.3	
:15:00	7.3		7.0		7.2		6.9		6.7		6.9		7.2	
:30:00	7.2		7.0		6.9		6.7		6.6		6.9		7.1	
:45:00	7.1	1.075	6.8	0.978	6.9	1.003	6.7	0.921	6.6	0.893	6.8	0.978	7.0	1.036
23:00:00	7.0		6.7		6.9		6.7		6.5		6.7		6.9	
:15:00	6.9		6.6		6.8		6.5		6.4		6.7		6.8	
:30:00	6.9		6.5		6.7		6.5		6.3		6.4		6.6	
:45:00	6.7	0.962	6.5	0.890	6.5	0.915	6.4	0.859	6.3	0.834	6.4	0.878	6.4	0.896
TOTAL FLOW		0.958		0.928		0.895		0.888		0.984		0.926		0.923
MINIMUMS	2:30:00	0.593	2:45:00	0.619	2:45:00	0.568	2:45:00	0.593	3:00:00	0.568	3:30:00	0.576	2:30:00	0.551
AM MINS	2:30:00	0.593	2:45:00	0.619	2:45:00	0.568	2:45:00	0.593	3:00:00	0.568	3:30:00	0.576	2:30:00	0.551
MAXIMUMS	7:15:00	1.212	7:15:00	1.153	7:30:00	1.153	7:45:00	1.141	10:30:00	1.333	10:45:00	1.321	20:00:00	1.236

Sensor : MAN Time of Report : 09-26-89 13:02:31 Flow Average for week : 0.915 Total Flow for week: 6.403

C I T Y O F N A P E R V I L L E Q U A D R A S C A N

NO: 5

SITEID : WWS
ID 1 : DIAMETER = 27.00 INCHES
ID 2 : CITY OF NAPERVILLE WW FLOW

PIPE DIAMETER : 27.000
PIPE SHAPE : CIRCULAR
ENERGY GRADIENT : 3.157 SERT(S)/N

BASIN : 2001 RIVER RD.
RAIN GAUGE:
MUD: 0.0

	TUESDAY AUG 29,1989		WEDNESDAY AUG 30,1989		THURSDAY AUG 31,1989	
	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD
0:00:00	6.3		6.1		6.0	
:15:00	6.2		5.9		6.0	
:30:00	5.9		5.8		5.9	
:45:00	5.8	0.734	5.7	0.788	5.7	0.710
1:00:00	5.7		5.6		5.6	
:15:00	5.6		5.5		5.4	
:30:00	5.5		5.4		5.4	
:45:00	5.4	0.624	5.3	0.602	5.3	0.602
2:00:00	5.3		5.2		5.2	
:15:00	5.2		5.2		5.2	
:30:00	5.2		5.1		5.1	
:45:00	5.2	0.561	5.0	0.541	5.0	0.535
3:00:00	5.3		5.1		5.0	
:15:00	5.4		5.2		5.1	
:30:00	5.4		5.2		5.1	
:45:00	5.4	0.554	5.2	0.549	5.2	0.533
4:00:00	5.4		5.3		5.3	
:15:00	5.5		5.4		5.4	
:30:00	5.5		5.4		5.4	
:45:00	5.5	0.608	5.5	0.591	5.4	0.586
5:00:00	5.6		5.6		5.5	
:15:00	5.7		5.7		5.7	
:30:00	5.9		5.8		5.9	
:45:00	6.0	0.657	6.1	0.633	6.1	0.683
6:00:00	6.4		6.4		6.5	
:15:00	6.9		6.9		7.0	
:30:00	7.3		7.4		7.4	
:45:00	7.5	1.003	7.8	1.026	7.7	1.033
7:00:00	7.8		8.0		7.9	
:15:00	7.8		8.2		8.0	
:30:00	7.8		8.0		8.0	
:45:00	7.7	1.218	7.6	1.264	7.6	1.246
8:00:00	7.5		7.7		7.7	
:15:00	7.3		7.5		7.4	
:30:00	7.1		7.4		7.2	
:45:00	7.0	1.064	7.3	1.130	7.1	1.096
9:00:00	6.9		7.2		7.1	
:15:00	7.0		7.1		6.9	
:30:00	6.9		6.9		6.8	
:45:00	6.7	0.956	6.8	0.992	6.8	0.964
10:00:00	6.7		6.8		6.9	
:15:00	6.8		6.7		6.9	
:30:00	6.7		6.7		6.8	
:45:00	6.8	0.924	6.7	0.911	6.8	0.948
11:00:00	6.8		6.7		6.7	
:15:00	6.7		6.6		6.7	
:30:00	6.6		6.5		6.7	
:45:00	6.7	0.900	6.5	0.869	6.5	0.893

	TUESDAY AUG 29,1989		WEDNESDAY AUG 30,1989		THURSDAY AUG 31,1989	
	RN DEPTH	MGD	RN DEPTH	MGD	RN DEPTH	MGD
12:00:00	6.7		6.5		6.4	
:15:00	6.7		6.4		6.4	
:30:00	6.6		6.3		6.3	
:45:00	6.6	0.890	6.3	0.821	6.3	0.824
13:00:00	6.6		6.4		6.3	
:15:00	6.7		6.3		6.3	
:30:00	6.7		6.3		6.3	
:45:00	6.7	0.933	6.3	0.829	6.2	0.799
14:00:00	6.7		6.2		6.2	
:15:00	6.6		6.2		6.2	
:30:00	6.6		6.1		6.3	
:45:00	6.4	0.898	6.1	0.775	6.3	0.767
15:00:00	6.5		6.1		6.3	
:15:00	6.5		6.2		6.2	
:30:00	6.5		6.3		6.3	
:45:00	6.5	0.854	6.3	0.784	6.3	0.804
16:00:00	6.5		6.3		6.2	
:15:00	6.5		6.3		6.3	
:30:00	6.6		6.4		6.3	
:45:00	6.5	0.864	6.4	0.824	6.4	0.809
17:00:00	6.7		6.4		6.5	
:15:00	6.7		6.6		6.7	
:30:00	6.7		6.7		6.8	
:45:00	6.9	0.916	6.7	0.892	6.8	0.908
18:00:00	6.9		6.9		6.9	
:15:00	6.9		6.9		7.0	
:30:00	7.0		7.0		7.2	
:45:00	7.3	0.995	7.0	0.978	7.2	1.022
19:00:00	7.3		7.1		7.4	
:15:00	7.4		7.2		7.2	
:30:00	7.3		7.3		7.3	
:45:00	7.4	1.092	7.3	1.061	7.3	1.075
20:00:00	7.4		7.3		7.3	
:15:00	7.6		7.2		7.4	
:30:00	7.7		7.4		7.7	
:45:00	7.6	1.159	7.6	1.101	7.6	1.156
21:00:00	7.4		7.6		7.8	
:15:00	7.4		7.4		7.7	
:30:00	7.4		7.3		7.6	
:45:00	7.3	1.095	7.2	1.107	7.5	1.176
22:00:00	7.2		7.1		7.4	
:15:00	7.0		7.0		7.2	
:30:00	6.9		6.9		7.0	
:45:00	6.9	0.986	6.8	0.975	6.9	1.025
23:00:00	6.7		6.7		6.9	
:15:00	6.6		6.5		6.8	
:30:00	6.5		6.3		6.5	
:45:00	6.3	0.870	6.1	0.927	6.4	0.853
TOTAL FLOW		0.891		0.868		0.800
MINIMUMS	2:15:00	0.559	2:45:00	0.519	2:45:00	0.511
AM MINS	2:15:00	0.559	2:45:00	0.519	2:45:00	0.511
MAXIMUMS	7:15:00	1.226	7:15:00	1.346	7:15:00	1.272

Sensor : MAN Time of Report : 09-26-89 13:32:45 Flow Average for week : 0.800 Total Flow for week: 2.639

APPENDIX B

NAPERVILLE FUTURE SANITARY FLOW CALCULATIONS

AREA NAME	USE	ACRES	SQUARE FOOTAGE (F.A.R.)	UNITS	FLOW RATE (GPD/AC. OR S T)	AVG. DAILY DRY WEATHER FLOW (MG)
I. Tributary to 27" Dia. River Road Sewer						
1. AT&T-Bell Labs (ATT)	Office Research	174	2,000,000	—	0.15/SF	0.30
2. NI Gas Company (NIG)	Office	110	2,000,000	—	0.10/SF	0.20
3. Nalco Corporation East (NCE)	Office Research	43	600,000	—	0.15/SF	0.09
					TOTAL	0.59 MG
II. Tributary to 36" Dia. River Road Sewer.						
1. OR+I Area 2 (ORI2)		37	500,000 (0.3)	—	0.10/SF	0.05
2. R.R. Donelly Site (RRD)	Office	110	1,500,000 (0.3)	—	0.10/SF	0.15
3 OR+I Area 1 (ORI1)		28	370,000 (0.3)	—	0.10/SF	0.04
4. NCC+I (NCCI)		22	290,000 (0.3)		0.10/SF	0.03
5. Industrial Developments International (IDI)	Office	54 (net)	~ 700,000	—	0.10/SF	0.07
					TOTAL THIS PAGE	0.34 MG.

Computed: MDC
Date: 10-3-90
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Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ELMHURST CHICAGO SCENE
Subject: SANITARY SEWER
Sheet No: 1 of 4

AREA NAME	USE	Acres	SQUARE FOOTAGE	UNITS	FLOW RATE (GPD/(Sq.Ft.)NET)	ADF (mgd) DRY WEATHER
6. Cacciatore Property (CP)	Office, Commercial, Retail, Restaurant	6	100,000	–	0.20/SF	0.02
7. Country Lakes						
a. Unit 3 (CL3)	Residential			43	350/UNIT	0.02
b. Unit 4 (CL4)	Residential	43		172	350/UNIT	0.06
c. Unit 5 (CL5)	Multi-Family			716	250/UNIT	0.18
Eagle Lakes	Day Care	48	10,000		0.2/SF	
	Clubhouse w/ Swimming Pool		6,000		0.3/SF	
d. Unit 6 (CL6)	Resort			300	150/UNIT	0.16
Royce Conference Center	Theater			1,800	5/UNIT	
	Banquet			1,800	10/UNIT	
	Hotel			320	150/UNIT	
	Office		260,000		0.16/SF	
	Racquet Club		20,000		0.50/SF	
e. Unit 7 (CL7)	Residential			60	250/UNIT	0.06
	Office		610,000		0.19/SF	
f. Unit 9 (CL9)	Office, Superstore, Restaurant	11	150,000		0.20/SF	0.03
g. Unit 14 (CL14)	Multi-Family	4		57	250/UNIT	0.02
h. Unit 15 (CL15)	Multi-Family	18		256	250/UNIT	0.06
					TOTAL THIS PAGE =	0.63

Computed: MDC
Date: 12-3-90
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Date:

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Engineering Calculations

Project: ELMHURST CHICAGO STONE
Subject: SANITARY SEWER
Sheet No: 2 of 4

/1200/Ac. on INN

AREA NAME	USE	Acres	SQUARE FOOTAGE (F.A.R.)	UNITS	FLOW RATE	ADF (MG) DRY WEATHER
8. Burlington Woods (BW)	Commercial: bank, 2 Restaurants, Retail, Day Care, Warehouse	13	170,000		0.30/SF	0.05
9. TTI Property (TTI)	Motel Restaurant	6	5000	60	150/UNIT 0.5/SF	0.01
10. Auburn Pointe (AP) Business Centre	Commercial					0.07
11. Copley Press (CP)		64	1,100,000		0.10/SF	0.11
12. K-5 Construction (K5)		20	260,000	(0.3)	0.10/SF	0.03
13. Commuter Parking (COP)		50	550,000	(0.25)	0.10/SF	0.06
					TOTAL THIS PAGE =	0.33
					PAGE 1 =	0.34
					PAGE 2 =	0.63
					TOTAL	1.30 MG

EXISTING FLOWS IN 24" DIA. McDOWELL RD.

DATE / DAY	DAILY FLOW (MG)	DATE/DAY	DAILY FLOW (MG)
1-25-89 / We	0.710	8-4-90 / Sa	0.611
1-26-89 / Th	0.678	8-5-90 / Su	0.596
1-27-89 / Fr	0.695	8-6-90 / Mo	0.582
1-28-89 / Sa	0.689		
1-29-89 / Su	0.739		
1-30-89 / Mo	0.783		
1-31-89 / Tu	0.739		
2-01-89 / We	0.768		
2-02-89 / Th	0.752		

Ave. Daily Dry Weather: $Q_{ADF} = 0.695$ MG

Computed: MLC
Date: 10-3-90
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

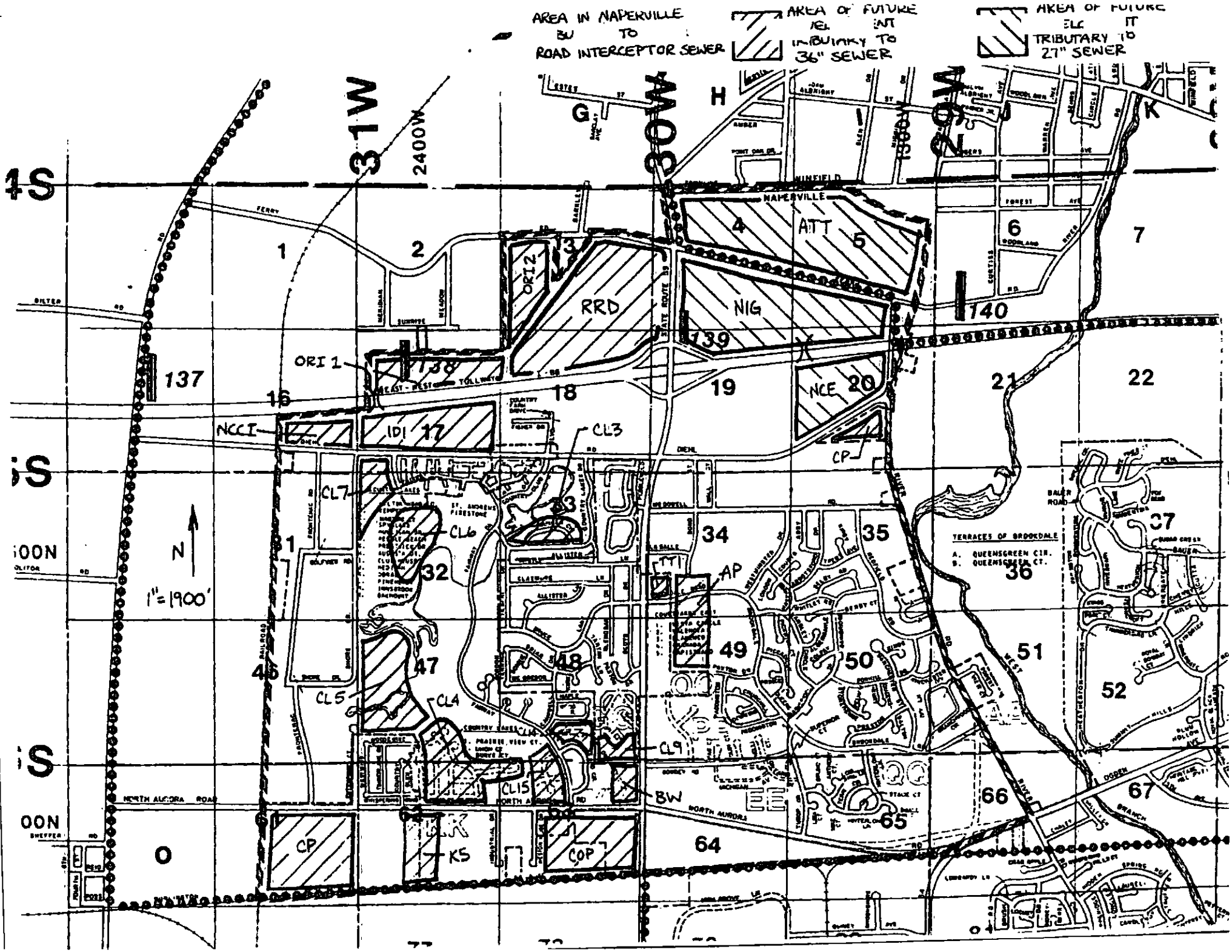
Project: ELMHURST CHICAGO STONE
Subject: SANITARY SEWER
Sheet No: 3 of 4

TOTAL FLOW IN 24" DIA. McDOWELL SEWER:

EXISTING FLOW	0.70 MGD
FUTURE FLOW	1.30 MGD
	2.00 MGD

CAPACITY: 24" RCP @ 0.12% → Q = 7.84 cfs = 5.06 MGD

Computed:	**SDI Consultants, Ltd.**	Project: ELMHURST CHICAGO STONE
Date:		Subject: SANITARY SEWER
Checked:	**Engineering Calculations**	Sheet No: 4 of 4
Date:		


AREA IN NAPERVILLE BU TO ROAD INTERCEPTOR SEWER
AREA OF FUTURE DEVELOPMENT TRIBUTARY TO 36" SEWER
AREA OF FUTURE DEVELOPMENT TRIBUTARY TO 27" SEWER
31W
2400W
30W
29W
4S
3S
2S
1S
00N
00N
G
H
I
J
K
L
NAPERVILLE
WINFIELD
ATT
RRD
NIG
NCE
ORI 1
ORI 2
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IDI
CL3
CL4
CL5
CL6
CL7
CL9
CL15
AP
BW
CP
KS
COP
N
1"=1900'
TERRACES OF BROOKDALE
A. QUEENSGREEN CIR.
B. QUEENSGREEN CT.
NORTH AURORA ROAD
WEST - EAST TOLLWAY
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APPENDIX C

SURCHARGE DATA CALCULATIONS

MH	RIM	I.E.	DIA (in)	S(%)	Q cap. (cfs)	d*	S_f (%)	L (ft)	H_m (ft)	WATER LEVEL	d
20	699.55	672.82							0.004	675.07	2.25
			27	-0.03			0.09	232			
21	704.89	672.74								675.28	2.54
			27	0.10	9.79	1.71	0.09	292			
22	706.38	673.03								675.55	2.52
			27	0.14	11.59	1.51	0.09	282			
23	714.56	673.44								675.81	2.37
			27	0.08			0.09	583			
24	695.32	673.90								676.34	2.44
			27	0.07			0.09	615			
25	697.04	674.36								676.90	2.54
			27	0.06			0.09	516			
26	702.73	674.65								677.37	2.72
			27	0.07			0.09	142			
27	703.97	674.78								677.50	2.72
			27	0.07			0.09	440			
28	696.67	675.69								677.94	2.25
			27	0.07			0.09	345			
29	701.95	676.38							0.004	678.63	2.25

27" DIAMETER

Q = 6 MGD

*FROM FIG. 1 ATTACHED

Computed: MDC
Date: 9/17-90
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ELMHURST CHICAGO STONE
Subject: SANITARY
Sheet No:

[redacted] n = 0.013 Q [redacted] 9 [redacted] 13.95 cfs [redacted] A = 3.98 [redacted] V = [redacted] Hm = 0.05 [redacted]

MH	RIM	I.E.	DIA (in)	S(%)	$Q_{cap.}$ (cfs)	d*	S_f (%)	L (ft)	Hm (ft)	WATER LEVEL	d
20	699.55	672.82							0.010	675.07	2.25
			27	0.03			0.21	232			
21	704.89	672.74								675.57	2.83
			27	0.10			0.21	292			
22	706.38	673.03								676.19	3.16
			27	0.14			0.21	282			
23	714.56	673.44								676.79	3.35
			27	0.08			0.21	583			
24	685.32	673.90								678.02	4.12
			27	0.07			0.21	615			
25	697.04	674.36								679.32	4.96
			27	0.06			0.21	516			
26	702.73	674.65								680.41	5.76
			27	0.07			0.21	142			
27	703.97	674.78								680.72	5.94
			27	0.07			0.21	440			
28	696.67	675.69								681.65	5.96
			27	0.07			0.21	345			
29	701.95	676.38							0.010	682.38	6.00

27" DIAMETER

Q = 9 MGD

* FROM FIG. 1 ATTACHED

Computed: MDC
Date: 9/7/90
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ELMHURST CHICAGO STONE
Subject: SANITARY
Sheet No:

Q [redacted] M 3.2[redacted]5 A[redacted]98 [redacted] [redacted] Q/[redacted] [redacted]5 V7 [redacted]

MH	RIM	I.E.	DIA (in)	S(%)	Q cap. (cfs)	d*	S_f (%)	L (ft)	H_m (ft)	WATER LEVEL	d
20	699.55	672.82							0.026	675.07	2.25
			27	-0.03			0.56	232			
21	704.89	672.74								676.40	3.66
			27	0.10			0.56	292			
22	706.38	673.03								678.06	5.03
			27	0.14			0.56	282			
23	714.56	673.44								679.67	6.23
			27	0.08			0.56	583			
24	685.32	673.90								682.96	9.06
			27	0.07			0.56	615			
25	697.04	674.36								686.43	12.07
			27	0.06			0.56	516			
26	702.73	674.65								689.35	14.70
			27	0.07			0.56	142			
27	703.97	674.78								690.17	15.39
			27	0.07			0.56	440			
28	696.67	675.69								692.66	16.97
			27	0.07			0.56	345			
29	701.95	676.38							0.026	694.62	18.24

27" DIAMETER

Q = 15 MGD

* FROM FIG. 1 ATTACHED

Computed: MDC
Date: 9-17-90
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ELMHURST, CHICAGO STONE
Subject: SANITARY
Sheet No:

Computed: NRC
Date: 9-17-90
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ECSQ
Subject: SANITARY
Sheet No:

MH	RIM	I.E.	DIA(in)	S	Q cap.(cfs)	Depth*	Sf	Length(ft)	Hm	Water Level	Depth from IE
7	705.02	667.32							0.005	668.88	1.56
			36	0.22	31.28	1.56		453			
8	698.42	668.32								670.27	1.95
			36	0.11	22.12	1.95		456			
9	692.92	668.82								671.82	3.00
			36	0.05			0.07	452			
10	697.50	669.03								672.14	3.11
			36	0.06			0.07	455			
11	696.00	669.32								672.46	3.14
			36	0.37	40.57	1.35	0.07	103			
11A	696.20	669.70								672.54	2.84
			36	0.07			0.07	327			
12	700.07	669.92								672.92	3.00
			36	-0.01	-		0.07	243			
13	701.12	669.90								673.10	3.20
			36	0.00			0.07	460			
14	693.68	669.90								673.43	3.53
			36	0.11	22.12	1.95	0.07	598			
15	692.08	670.54								673.85	3.31
			36	0.12	23.11	1.89	0.07	285			
15A	690.54	670.89								673.63	2.74
			36	0.04			0.07	306			
16	688.45	671.01								674.01	3.00
			36	0.08	18.87	2.19	0.07	605			
17	688.04	671.48								674.44	2.96
			36	0.09	20.01	2.10	0.07	341			
17A	701.25	671.81								674.68	2.87
			36	0.03			0.07	98			
18	694.28	671.84								674.75	2.91
			36	0.07			0.07	526			
19	693.44	672.20								675.12	2.92
			36	0.14	24.96	1.80		440			
20	699.55	672.82							0.005	675.43	2.61

36" DIAMETER; Q = 11 MGD

* FROM FIG. 1 attached

Computed: NKC
Date: 9-17-90
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ECSQ
Subject: SANITARY
Sheet No:

MH	RIM	I.E.	DIA(in)	S	Q cap(cfs)	Depth	Sf	Length(ft)	Hm	Water Level	Depth from IE
7	703.02	667.32							0.008	669.39	2.07
			36	0.22	31.28	2.07		453			
8	698.42	668.32								671.32	3.00
			36	0.11			0.12	456			
9	692.92	668.82								671.88	3.06
			36	0.05			0.12	452			
10	697.50	669.03								672.43	3.40
			36	0.06			0.12	455			
11	696.00	669.32								672.98	3.66
			36	0.37	40.57		0.12	103			
11A	696.20	669.70								673.11	3.41
			36	0.07			0.12	327			
12	700.07	669.92								673.51	3.59
			36	-0.01			0.12	243			
13	701.12	669.90								673.81	3.91
			36	0.00			0.12	460			
14	673.68	669.90								674.37	4.47
			36	0.11			0.12	598			
15	692.08	670.54								675.10	4.56
			36	0.12			0.12	285			
15A	690.54	670.89								675.45	4.56
			36	0.04			0.12	306			
16	688.45	671.01								675.83	4.82
			36	0.08			0.12	605			
17	698.04	671.48								676.56	5.08
			36	0.09			0.12	341			
17A	701.25	671.81								676.98	5.17
			36	0.03			0.12	98			
18	694.28	671.84								677.11	5.27
			36	0.07			0.12	526			
19	693.44	672.20								677.75	5.55
			36	0.14	24.96		0.12	440			
20	699.55	672.82								678.28	5.46

* FROM FIG. 1 attached

36" DIAMETER; Q = 15 MGD

n = 0.013 Q = 24 MGD = 37.20 CFS A = 1.07 ft² V = A Hm = 0.05 ft/ft

MH	RIM	I.E.	DIA(in)	S	Q cap (cfs)	Depth**	Sf	Length(ft)	Hm	Water Level	Depth from IE
7	703.02	667.32							0.021	670.32	3.00
			36	0.22			0.31	453			
8	698.42	668.32								671.75	3.43
			36	0.11			0.31	456			
9	692.92	668.82								673.18	4.36
			36	0.05			0.31	452			
10	697.50	669.03								674.60	5.57
			36	0.06			0.31	455			
11	696.00	669.32								676.03	6.71
			36	0.37			0.31	103			
11A	696.20	669.70								676.37	6.67
			36	0.07			0.31	327			
12	700.07	669.92								677.40	7.48
			36	-0.01			0.31	243			
13	701.12	669.90								678.17	8.27
			36	0.00			0.31	460			
14	693.68	669.90								679.62	9.72
			36	0.11			0.31	598			
15	692.08	670.54								681.49	10.95
			36	0.12			0.31	285			
15A	690.54	670.89								682.39	11.50
			36	0.04			0.31	306			
16	688.45	671.01								683.36	12.35
			36	0.08			0.31	605			
17	698.04	671.48								685.26	13.78
			36	0.09			0.31	341			
17A	701.25	671.81								686.34	14.53
			36	0.03			0.31	98			
18	694.28	671.84								686.66	14.82
			36	0.07			0.31	526			
19	693.44	672.20								688.31	16.11
			36	0.14			0.31	440			
20	689.55	672.82							0.021	689.70	16.88

* FROM FIG. 1 attached

36" DIAMETER; Q = 24 MGD

Computed: MDC
Date: 9-17-90
Checked:
Date:

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Engineering Calculations

Project: ECSQ
Subject: SANITARY
Sheet No:

n = 0.013 Q = 20 MGD = 31.00 CFS A = 9.62 sf V = Q/A Hm = 0.05 V²/2g

MH	RIM	I.E.	DIA (in)	S(%)	Q(cap.) (cfs)	d*	Sf (%)	L (ft)	Hm (ft)	WATER LEVEL	d
WW	638.00	618.02							0.005	620.31	2.29
			48	0.13	51.77	2.28	0.13	347			
JMH	637.70	621.40							0.008	623.58	2.18
			42	0.22	47.19	2.17	0.22	396			
1	637.83	622.23							0.008	624.46	2.23
			42	0.22	47.19	2.17	0.22	407			
2	637.07	623.15							0.008	625.36	2.21
			42	0.22	47.19	2.17	0.22	485			
3	637.31	624.21							0.008	626.44	2.23
			42	0.23	48.25	2.14	0.23	505			
4	640.71	625.41							0.008	627.61	2.20
			42	0.22	47.19	2.17	0.22	499			
5	647.03	626.63							0.008	628.80	2.17
			42	0.17	41.48	2.42	0.17	500			
6	651.00	627.50							0.008	629.92	2.42
			42	0.18	42.69	2.35	0.18	461			
7	652.95	628.35							0.008	630.76	2.41
			42	0.20	44.99	2.28	0.20	543			
8	661.67	629.47							0.008	631.85	2.36
			42	0.58	76.62	1.54	0.58	568			
9	665.02	632.72							0.008	635.09	2.37
			42	0.48	69.70	1.58	0.48	561			
10	650.03	635.43							0.008	637.79	2.36
			42	0.36	60.37	1.75	0.36	430			
11	646.77	636.97							0.008	639.35	2.38
			42	0.73	85.96	1.44	0.73	425			
12	652.09	640.09							0.008	642.46	2.37
			42	0.45	67.49	1.65	0.45	531			
13	663.83	642.48							0.008	644.86	2.38
			42	0.49	70.43	1.61	0.49	514			
14	666.45	645.00							0.008	647.39	2.38
			42	0.54	73.93	1.55	0.54	531			
15	663.57	647.87							0.008	651.37	3.50
			42	0.08	—	—	0.09	529			
16	666.98	648.28							0.008	651.86	3.58

* FROM FIG. 1

42" DIAMETER; Q = 20 MGD

Computed: MM
Date: 9-17-90
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ELMHURST CHICAGO STONE
Subject: SANITARY
Sheet No: 1 of 3

n = [redacted]13 Q = 20 [redacted] MGD = 31.00 CFS [redacted] A = 9.62 [redacted] SF V = Q/A [redacted] H = 0.05 V²/2g [redacted]

Computed: MDC Date: 9-17-90
Checked: Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ELMHURST CHICAGO STONE
Subject: SANITARY
Sheet No: 2 of 3

MH	RIM	I.E.	DIA (IN)	S(%)	Q CAP. (CFS)	d*	S_f (%)	L (FT)	Hm (FT)	WATER LEVEL	d
			42*	0.09	—	—	0.09	499			
17	668.57	668.77							0.008	652.32	3.55
				0.12	34.85	2.87	0.09	506			
18	669.00	669.40								652.78	3.38
				0.04	—	—	0.09	445			
19	669.88	669.58								653.19	3.61
				0.11	33.37	2.98	0.09	506			
20	675.46	670.16								653.65	3.49
				0.11	33.37	2.98	0.09	499			
21	681.42	670.72								654.11	3.39
				0.13	36.28	2.73	0.09	498			
22	678.87	671.37								654.57	3.20
				0.04	—	—	0.09	499			
23	681.75	671.55								655.03	3.48
				0.10	31.82	3.26	0.09	506			
24	684.50	672.45								655.49	3.26
				0.12	34.85	3.26	0.09	497			
25	682.00	673.06								656.32	3.26
				0.10	31.82	3.26	0.10	505			
26	688.36	673.61								656.87	3.26
				0.10	31.82	3.26	0.10	492			
27	682.08	673.78								657.04	3.26
				0.10	31.82	3.26	0.10	504			
28	675.50	674.53								657.79	3.26
				0.10	31.82	3.26	0.10	300			
29	682.70	674.70								658.20	3.50
				0.08	—	—	0.09	401			
30	678.43	675.03								658.57	3.54
				0.15	38.97	2.59	0.09	503			
31	677.62	675.82								659.03	3.21
				—	—	—	—	—			
31	677.62	675.26								668.76	3.50
				0.08	—	—	0.09	489			
37	693.94	675.64								669.21	3.57
				0.07	—	—	0.09	549			
36	684.63	676.03								669.71	3.68

* FROM FIG 1

MH	RIM	I.E.	DIA (in)	S(%)	Q_{cap} (cfs)	d*	S_f (%)	L (ft)	H_m (ft)	WATER LEVEL	d
			42	0.14	37.64	2.63	0.09	550			
39	680.13	666.83							0.008	670.21	3.38
			42	0.05	–	–	0.09	505			
40	701.00	667.10								670.67	3.51
			42	0.05	–	–	0.09	497			
41	689.05	667.35								671.13	3.78
			42	0.12	34.85	2.87	0.09	496			
42	678.47	667.97								671.58	3.61
			42	0.11	33.37	2.98	0.09	504			
43	680.44	668.54								672.04	3.50
			42	0.05	–	–	0.09	498			
44	685.21	668.81								672.50	3.69
			42	0.08	–	–	0.09	551			
45	689.47	669.27								673.00	3.73
			42	0.11	33.37	2.98	0.09	506			
46	679.74	669.84								673.46	3.62
			42	0.10	31.82	3.19	0.09	507			
47	679.87	670.37								673.92	3.55
			42	0.10	31.82	3.19	0.09	506			
48	680.12	670.90								674.38	3.48
			42	0.10	31.82	3.19	0.09	513			
49	681.57	671.51								674.85	3.34
			42	0.10	31.82	3.19	0.09	505			
50	681.94	672.04								675.31	3.27
			42	0.10	31.82	3.19	0.09	498			
51	681.08	672.48								675.77	3.29
			42	0.10	31.82	3.19	0.09	520			
52	682.46	673.06								676.25	3.19
			42	0.17	41.48	2.45	0.17	385			
53	684.24	673.74								676.91	3.17
			42	0.07			0.09	407			
54	685.74	674.04								677.28	3.24
			42	0.23	48.25	2.10		385			
55	700.05	674.95							0.008	677.63	2.68
↓			42	—							
60	693.68	682.51									

Computed: MDC
Date: 9-17-90
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ELMHURST CHICAGO STONE
Subject: SANITARY
Sheet No: 3 of 3

[redacted] Q [redacted] M[redacted]46.[redacted]5 12.51 st A[redacted]9.6 [redacted] Q [redacted] Hm [redacted]5 [redacted]

MH	RIM	I.E.	DIA (in)	S(%)	$Q_{cap.}$ (cfs)	d*	S_f (%)	L (ft)	Hm (ft)	WATER LEVEL	d	depth above crown
WW	638.00	618.02							0.01	622.03	4.01	0.01
			48	0.13	51.79	3.32	0.13	347				
JMH	637.70	621.40							0.02	624.75	3.35	
			42	0.22	47.19	3.33	0.22	396				
1	637.83	622.23								625.64	3.41	
			42	0.22	47.19	3.33	0.21	407				
2	637.07	623.15								626.51	3.36	
			42	0.22	47.19	3.33	0.22	485				
3	637.31	624.21								627.60	3.39	
			42	0.22	48.25	3.15	0.21	505				
4	640.71	625.41								628.68	3.27	
			42	0.22	47.19	3.33	0.22	499				
5	647.03	626.63								630.13	3.50	
			42	0.17	–	–	0.21	500				
6	651.00	627.50										
			42	0.18	–	–	0.21	461				
7	652.95	628.35										
			42	0.20	–	–	0.21	543				
8	661.67	629.47								633.35	3.88	0.33
			42	0.56	76.62	2.00		558				
9	665.02	632.72										
			42	0.48	69.70	2.21		561				
10	650.03	635.43										
			42	0.36	60.37	2.49		430				
11	646.77	636.97										
			42	0.73	85.96	1.86		425				
12	652.09	640.09										
			42	0.45	67.49	2.28		531				
13	663.83	642.48										
			42	0.49	70.43	2.17		514				
14	666.45	645.00										
			42	0.54	73.93	2.07		531				
15	663.57	647.87										
			42	0.08	–	–	0.21	529				
16	666.98	648.78							0.02	651.78	3.50	

* FROM FIG. 1

42" DIAMETER; Q = 30 MGD

ADEQUATE CAPACITY

Computed: MDC
Date:
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ELMHURST CHICAGO STONE
Subject: SANITARY
Sheet No: 1 of 3

[redacted] Q. [redacted] MG[redacted] A [redacted] Q/A [redacted]

Computed: MDC
Date:
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

MH	RIM	I.E.	DIA (IN)	S(%)	Q CAP. (CFS)	d*	S_f (%)	L (FT)	H_m (FT)	WATER LEVEL	d	
			42	0.09	–	–	0.21	499				
17	668.57	648.77							0.02	652.85	4.08	0.58
			42	0.12	–	–	0.21	506				
18	669.00	649.40								653.93	4.53	1.03
			42	0.04	–	–	0.21	445				
19	669.88	649.58										
			42	0.11	–	–	0.21	506				
20	675.46	650.16										
			42	0.11	–	–	0.21	499				
21	681.42	650.72										
			42	0.13	–	–	0.21	498				
22	678.87	651.37										
			42	0.04	–	–	0.21	499				
23	681.75	651.55										
			42	0.10	–	–	0.21	506				
24	684.50	652.45										
			42	0.12	–	–	0.21	497				
25	682.00	653.06										
			42	0.10	–	–	0.21	505				
26	688.36	653.61										
			42	0.10	–	–	0.21	492				
27	682.08	653.78										
			42	0.10	–	–	0.21	504				
28	675.50	654.53										
			42	0.10	–	–	0.21	300				
29	682.70	654.70										
			42	0.08	–	–	0.21	401				
30	678.43	655.03										
			42	0.15	–	–	0.21	503				
31	677.62	655.82							0.02	667.12	11.30	7.90
			–	–	–	–	–	–				
31	677.62	665.26							0.01	668.76	3.50	
			42	0.08	–	–	0.15	489				
37	693.94	665.64										
			42	0.07	–	–		549				
38	684.63	666.03							0.01			

Q = 25 MGD = 38.75 CFS

Project: ELMHURST, CHICAGO STONE
Subject: SANITARY
Sheet No: 2 of 3

Q [redacted] Q = [redacted] MG [redacted] 68.7 [redacted] A [redacted] 62 [redacted] V = Q/A [redacted] Hm = [redacted] 45 V% [redacted]

42" DIAMETER

[redacted] = 25 MGD

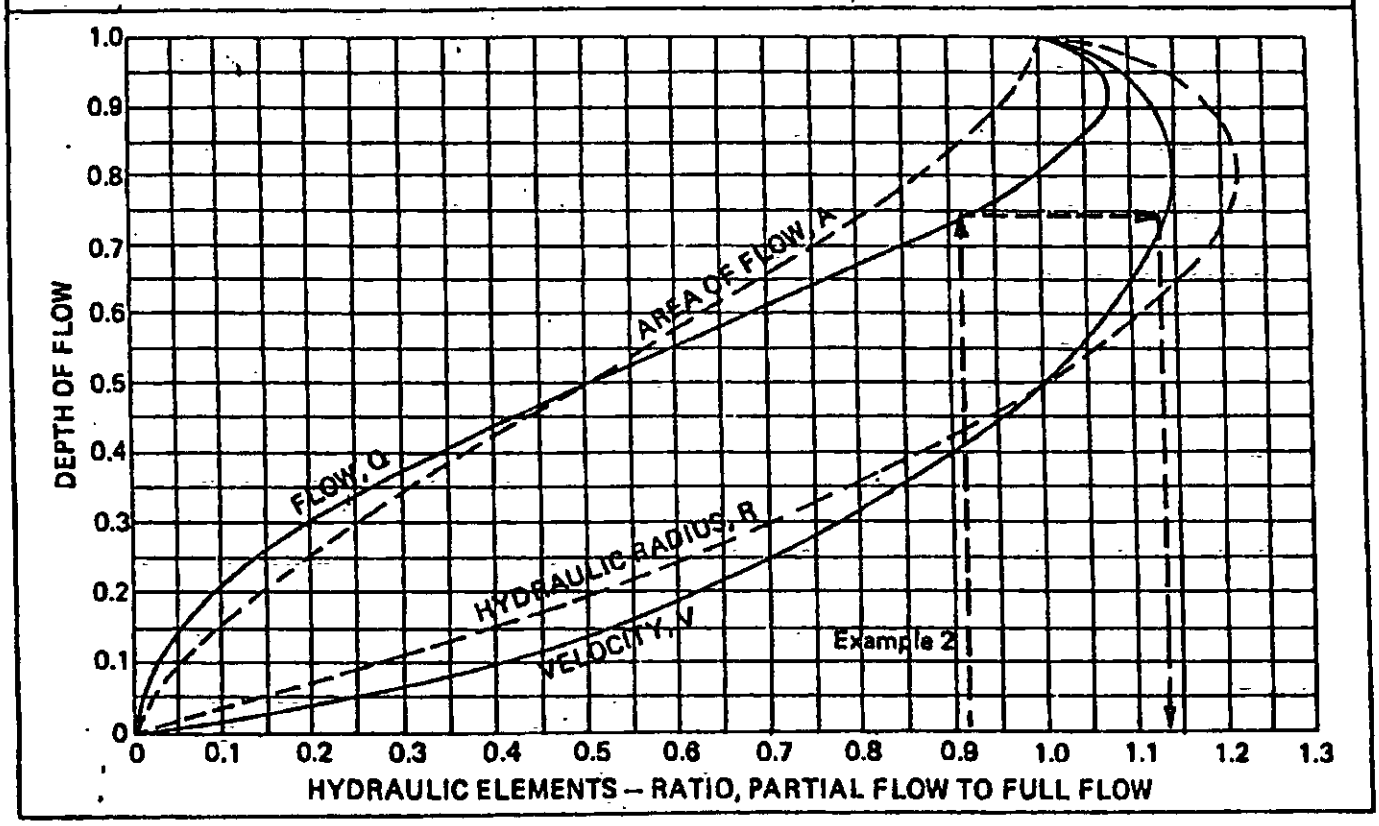
MH	RIM	I.E.	DIA (in)	S(%)	Q cap. (cfs)	d*	Sf (%)	L (ft)	Hm (ft)	WATER LEVEL	d	
			42	0.14			0.15	550				
39	690.13	666.83							0.01			
				0.05			0.15	505				
40	701.00	667.10										
				0.05			0.15	497				
41	689.05	667.35										
				0.12			0.15	496				
42	678.47	667.97								673.45	5.48	1.98
				0.11			0.15	504				
43	680.44	668.54								674.22	5.68	2.18
				0.05			0.15	498				
44	685.21	668.81										
				0.08			0.15	551				
45	689.47	669.27										
				0.11			0.15	506				
46	679.74	669.84								676.58	6.74	3.24
				0.10			0.15	507				
47	679.87	670.37								677.35	6.98	3.48
				0.10			0.15	506				
48	680.12	670.90										
				0.10			0.15	513				
49	681.57	671.51										
				0.10			0.15	505				
50	681.94	672.04										
				0.10			0.15	498				
51	681.08	672.48								680.42	7.94	4.44
				0.10			0.15	520				
52	682.46	673.06										
				0.17			0.15	385				
53	684.24	673.74										
				0.07			0.15	407				
54	685.72	674.04								682.42	8.38	4.88
				0.23			0.15	385				
55	700.05	674.95								683.01	8.07	4.57
			42	0.10			0.15	385				
56	701.06	675.97							0.01	683.59	8.62	5.12
60	683.66	682.51						1580	0.05	684.03	3.52	0.02

Computed: MDC
Date:
Checked:
Date:

SDI Consultants, Ltd.
Engineering Calculations

Project: ELMHURST CHICAGO STONE
Subject: SANITARY
Sheet No: 3 of 3

FIGURE 1: Relative Velocity and Flow in Circular Pipe for Any Depth of Flow.



Sanitary Sewer Maintenance Tracking

Appendix GG

DPU-W Collection and Pumping
2019 YTD Basin Flushing & PMS Totals

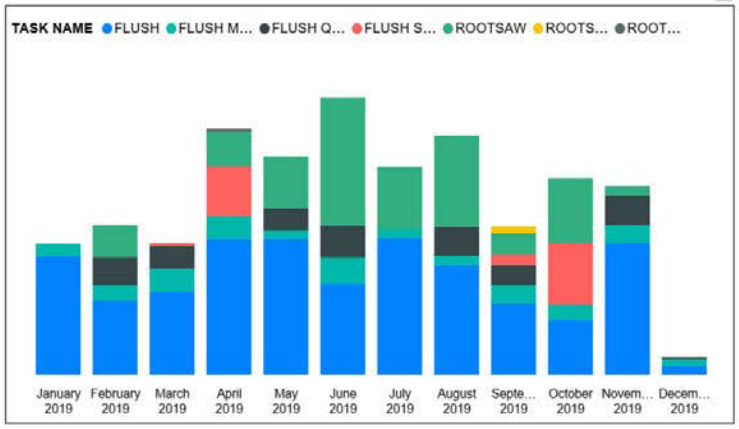
2019 Flushing Footage:

Basins: 1,135,260 LF
PMS: 395,383 LF

Total: 1,530,643 LF

1,334,420
YTD Total Footage (LF)

87.18%
YTD Percent Complete



WO DESCRIPTION	WORKORDERID	TASK NAME	TASK FINISH DATE	LENGTH (LF)
BASIN CLEAN	156589	ROOTSAW	5/30/2019 3:03:38 PM	10
BASIN CLEAN	157623	FLUSH	6/4/2019 12:00:00 PM	140
PMS	152560	FLUSH QUARTERLY	3/7/2019 12:00:00 PM	150
BASIN CLEAN	159851	FLUSH	7/18/2019 12:00:00 PM	160
BASIN CLEAN	158474	FLUSH	6/21/2019 12:00:00 AM	200
BASIN CLEAN	157214	ROOTSAW	5/24/2019 12:00:00 PM	230
BASIN CLEAN	158474	FLUSH	6/20/2019 12:00:00 PM	240
PMS	164430	ROOTSAW SEMI-ANNUAL	10/8/2019 12:00:00 AM	240
BASIN CLEAN	160266	ROOTSAW	7/27/2019 12:00:00 PM	260
BASIN CLEAN	166525	ROOTSAW	11/21/2019 12:00:00 PM	270
PMS	152560	FLUSH MONTHLY	3/21/2019 12:00:00 PM	285
BASIN CLEAN	158634	FLUSH	6/22/2019 12:00:00 PM	290
BASIN CLEAN	158634	ROOTSAW	6/21/2019 12:00:00 PM	290
PMS	157721	FLUSH QUARTERLY	6/3/2019 12:00:00 AM	320
PMS	152560	FLUSH SEMI-ANNUAL	3/7/2019 12:00:00 PM	320
BASIN CLEAN	157338	FLUSH	6/1/2019 12:00:00 PM	350
BASIN CLEAN	157622	FLUSH	6/10/2019 12:00:00 PM	350
BASIN CLEAN	166525	FLUSH	12/3/2019 12:00:00 PM	350
PMS	154038	FLUSH SEMI-ANNUAL	4/13/2019 12:00:00 AM	360
BASIN CLEAN	154799	FLUSH	4/24/2019 12:00:00 PM	370
Total				**1,334,420**

Microsoft Power BI 4 of 4

Naperville

2019 Sanitary Sewer Televising Status

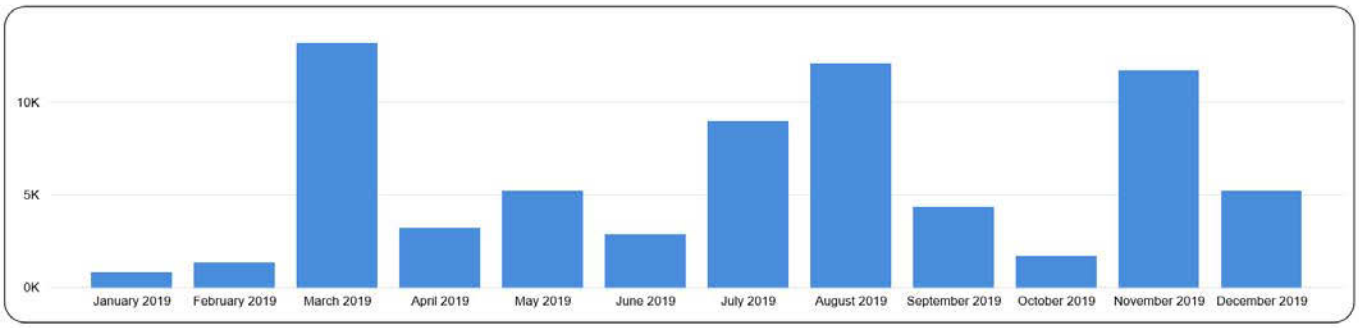
Date Range
1/1/2019 12/31/2019

Televising Schedule Total Footage
70,000

YTD Footage Televised
70,975

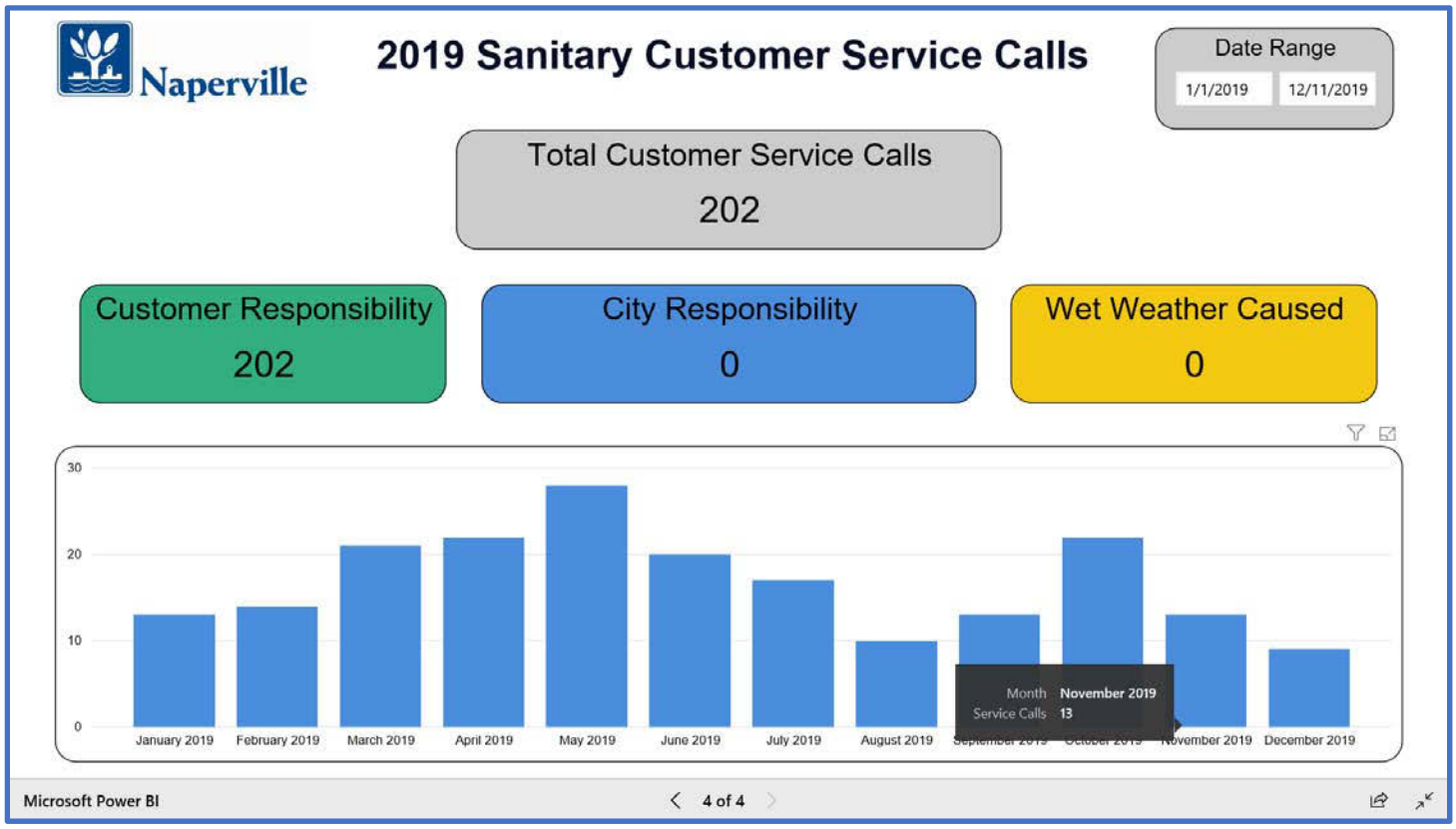
Percent of Schedule Completed
100%

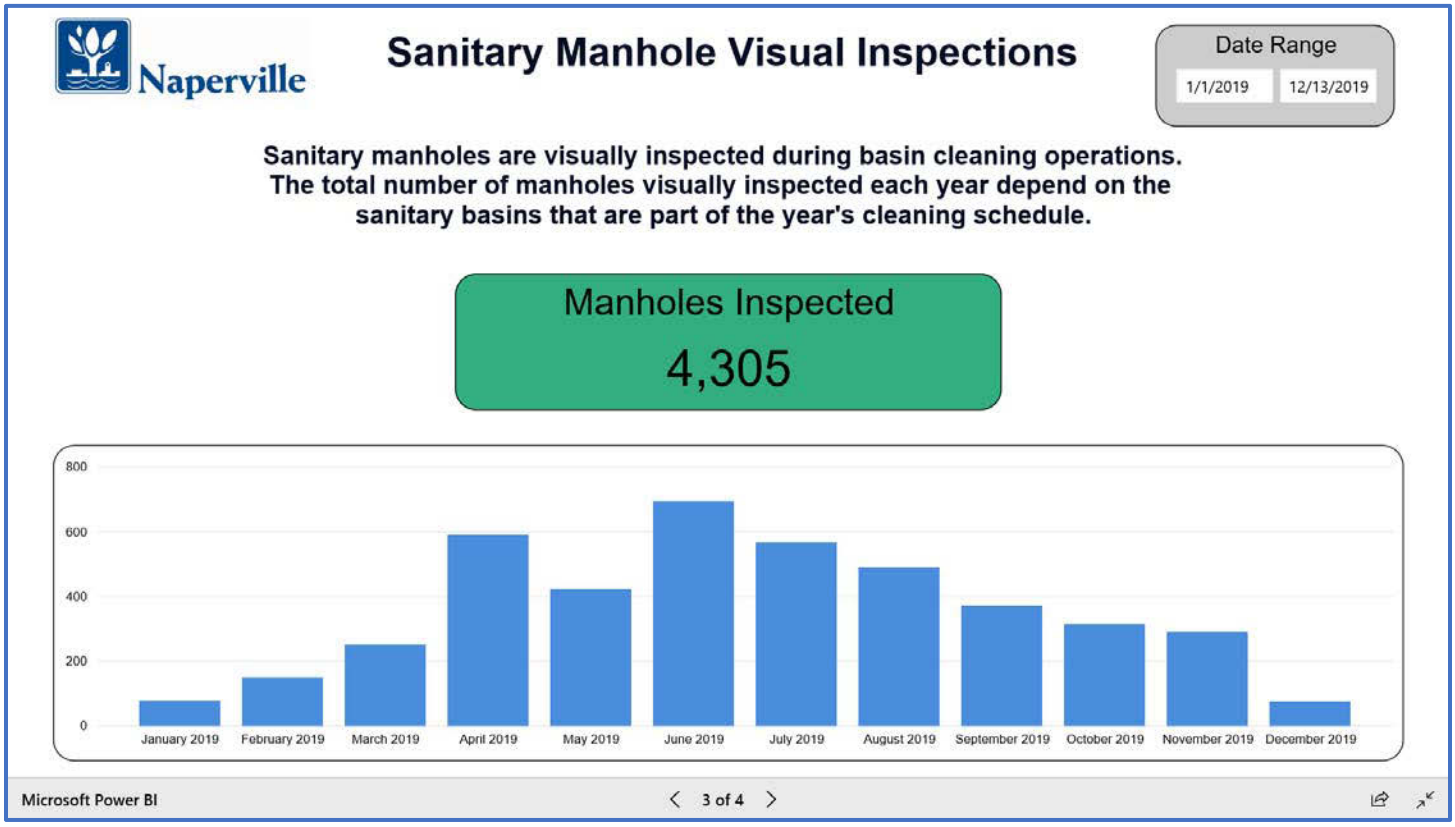
Remaining Footage
0



Microsoft Power BI 1 of 4

Sanitary Sewer Maintenance Tracking





Sanitary Sewer Maintenance Tracking

Pump Station Flow, Ground Water & Rain

Site: North Operating Center

Serial #: 970 F.M. Version 1.19 Site ID: Region: Territory: Naperville

Date	Lagoon Flow (MG)		Time at Minimum	Minimum GPM	Time at Maximum	Maximum GPM	Average GPM	Rainfall (In.)
1	0.000		12:00 AM	0	12:00 AM	0	0	0.15
2	0.000		12:00 AM	0	12:00 AM	0	0	0.00
3	0.000		12:00 AM	0	12:00 AM	0	0	0.00
4	0.000		12:00 AM	0	12:00 AM	0	0	0.00
5	0.000		12:00 AM	0	12:00 AM	0	0	0.00
6	0.000		12:00 AM	0	12:00 AM	0	0	0.00
7	0.000		12:00 AM	0	12:00 AM	0	0	0.00
8	0.000		12:00 AM	0	12:00 AM	0	0	0.00
9	0.000		12:00 AM	0	12:00 AM	0	0	0.00
10	0.000		12:00 AM	0	12:00 AM	0	0	0.02
11	0.000		12:00 AM	0	12:00 AM	0	0	0.01
12	0.000		12:00 AM	0	12:00 AM	0	0	0.00
13	0.000		12:00 AM	0	12:00 AM	0	0	0.00
14	0.000		12:00 AM	0	12:00 AM	0	0	0.00
15	0.000		12:00 AM	0	12:00 AM	0	0	0.00
16	0.000		12:00 AM	0	12:00 AM	0	0	0.00
17	0.000		12:00 AM	0	12:00 AM	0	0	0.04
18	0.000		12:00 AM	0	12:00 AM	0	0	0.00
19	0.000		12:00 AM	0	12:00 AM	0	0	0.05
20	0.000		12:00 AM	0	12:00 AM	0	0	0.00
21	0.000		12:00 AM	0	12:00 AM	0	0	0.58
22	0.000		12:00 AM	0	12:00 AM	0	0	0.00
23	0.000		12:00 AM	0	12:00 AM	0	0	0.00
24	0.000		12:00 AM	0	12:00 AM	0	0	0.00
25	0.000		12:00 AM	0	12:00 AM	0	0	0.00
26	0.000		12:00 AM	0	12:00 AM	0	0	0.40
27	0.000		12:00 AM	0	12:00 AM	0	0	0.17
28	0.000		12:00 AM	0	12:00 AM	0	0	0.00
29	0.000		12:00 AM	0	12:00 AM	0	0	0.03
30	0.000		12:00 AM	0	12:00 AM	0	0	0.38
31								
			Date Occurred					
Minimum	0.000		0					0.000
Average	0.000							0.061
Maximum	0.000		0					0.580
Total	0.000							1.830

Cityworks

Inbox | Recent | New Service Request | New Work Order | Inspections | Projects | Crews | Reports | Calendar

Work Order | Email | Print | Save | Close | Delete

Work Order

Description: Lift Station Repair
Number: 149632
Entity Type: SLIFTSTATION Change
Category: Wastewater
Initiated By: LIBRIZZI, KATY Date: 01/6/2019 5:41 PM
Status: In Progress Priority: Medium
Requested By: LIBRIZZI, KATY Supervisor: LIBRIZZI, KATY
Submit To: SELVAGGI, FRANKO Date: 01/6/2019 5:41 PM
Projected Start: 01/6/2019 5:41 PM Projected Finish: 01/8/2019 5:41 PM
Opened By: SELVAGGI, FRANKO Date: 8/24/2019 2:30:12 PM
Closed By: Date:
Completed By:
Actual Start: 01/1/2019 12:00 AM Actual Finish:
Stage: Actual Expense Type: Maintenance

Comments: Add Comment Sort ▲

- **ANTICH, JAMIE** edited **01/14/2019 8:17 AM**
  1-11-19 We pulled the grinder and took it to n.o.c to clean and start...
- **ANTICH, JAMIE** **01/14/2019 8:35 AM**
  1-12-19 We took apart the grinder from top to bottom for repairs. W...
- **SUBAT, STEVEN** **01/16/2019 3:18 PM**
  work on channel grinder repair
- **SUBAT, STEVEN** **01/17/2019 2:37 PM**
  grinder repair
- **SUBAT, STEVEN** **01/18/2019 3:00 PM**
  while putting the grinder back together...burnt grease smell and evi...
- **SUBAT, STEVEN** **11/27/2019 8:54 AM**
  repaired torn overtemp and seal fail wires of pump 3 from lower cra...

Instructions: 2019 LIFT STATION REPAIR WORK ORDER. REPAIR OR REPLACEMENT OF MAJOR COMPONENTS

Resolution Reactive? ☐

Details

Project: 230150 Lift Station / SC Account:
+ Project Tree
Contract: Contractor:
Legal Billable: ☐ Contractor Billable: ☐
Update Map: ☐ Cancel Work Order: ☐
Cancelled By: Date:
Cancel Reason:
Units Accomp.: 0 Description:
Lock Units Desc.: ☐
Labor Cost: $1,728.16 Material Cost: $0.00
Equipment Cost: $356.94 Permit Cost: $0.00
Total WO Cost: $2,085.10

Location Information

WO Address: SOC
Location Details: 1800 S Washington St
Shop: Map Page: 13B
Tile Number: 161 District:
X Location: 1,040,366.450 Y Location: 1,846,291.609

Assets

Total Entities: 1

Asset	Asset Id	Asset Uid	Location	Warranty Date	Wo
SLIFTSTATION	653	124958	1800 S Washington St		

- Pink rows indicate inventory still under warranty

Update Work Order XY when adding/removing assets? ☑

Map Layer Fields

Reset

Tasks

SeqID	Name	Description	Status
1	LS CHANNEL GRINDER	Maintenance or Repair of Channel Grinder	COMPLETE
2	LS CHANNEL GRINDER	Maintenance or Repair of Channel Grinder	COMPLETE
3	LS CHANNEL GRINDER	Maintenance or Repair of Channel Grinder	COMPLETE
4	LS PUMPS	LS PUMPS Maintenance or Repair	COMPLETE

Work Cycle

Repeat: Never
Interval: 6 Months
From: Actual Finish Date
Date Printed: 12/17/2019 Next Print Date: 1/4/2019

Related Work Activities

Service Requests

Add Request:
Remove

Inspections

Add Inspection:
Remove

Work Orders

Parent:
Create Child Work Order

Permits

Create

Attachments

Figure 6. RDII volume expressed as Percent of rainfall entering the sewers as RDII.

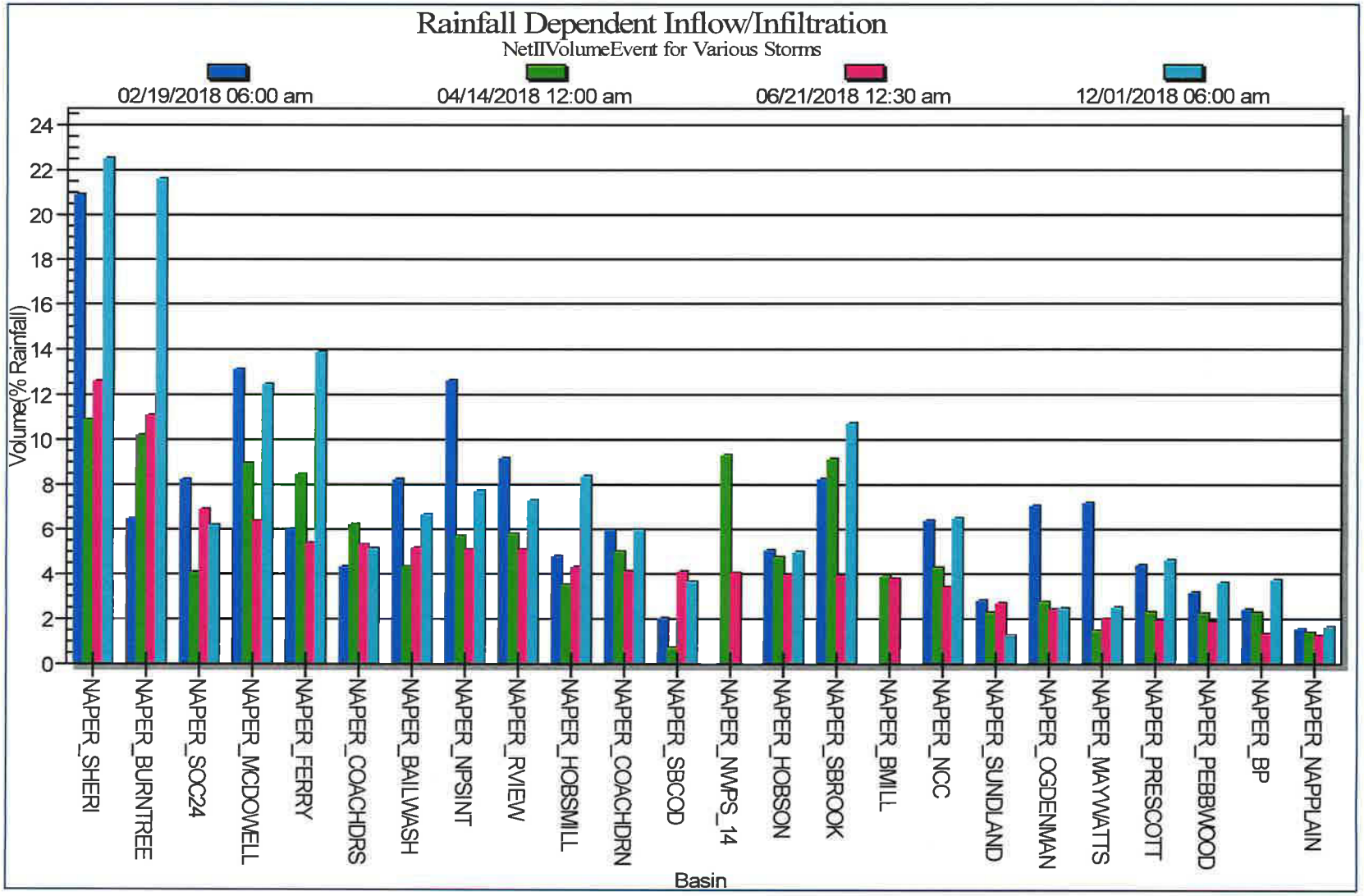
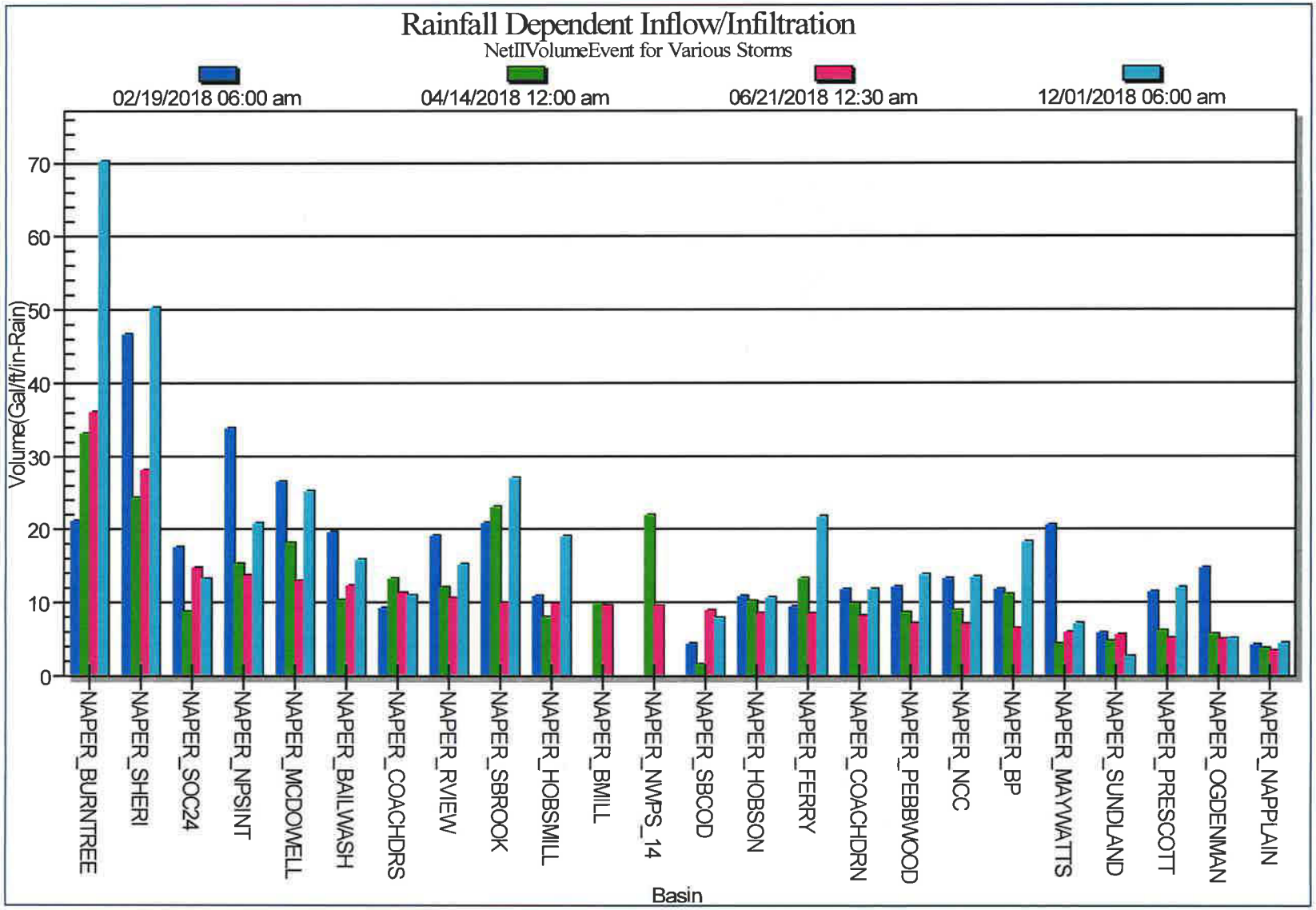
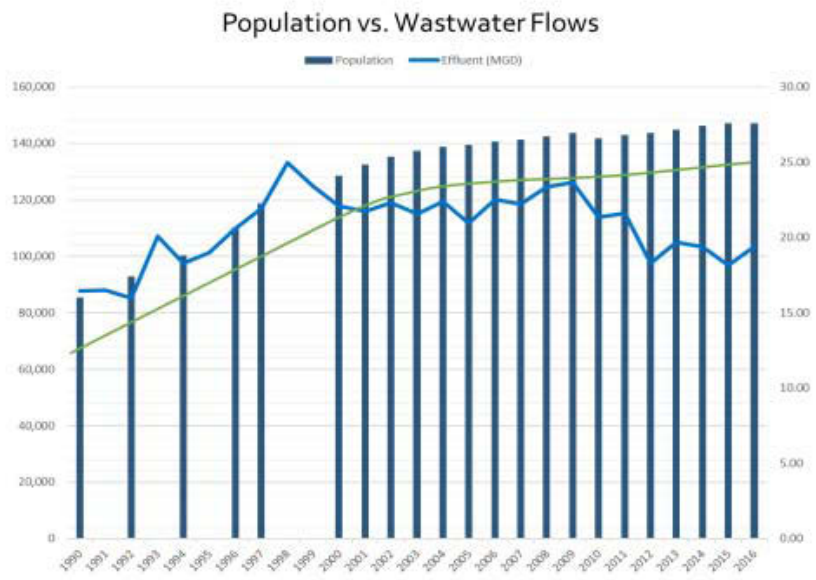


Figure 7 The RDII volume expressed in Gallons/LF of sewer/Inch of rainfall



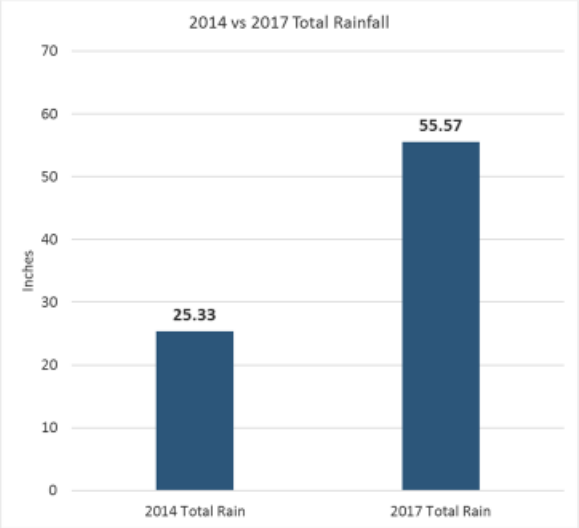
Naperville

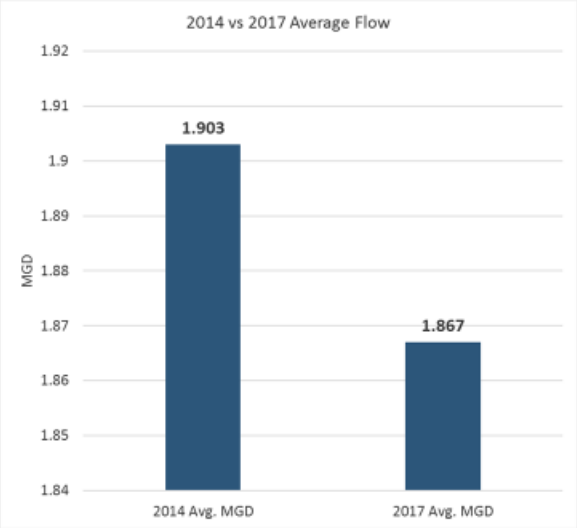
CITY WIDE INFLOW AND INFILTRATION REDUCTION



Green Line is flows to the treatment plant with the I&I reduction program. 26MGD

Prescott Flow Meter Basin I/I reduction Results After Rehab.





CITYWORKS WORK ORDER # 79189

Appendix KK

Description: **CUSTOMER SERVICE SEWER** **Address:** **HILLSIDE AND MELODY**

General Location **Main line backup 11-3-13** **City Grid#:** **99**

Timesheet Code **242227**

Created By: **SELVAGGI, FRANKO** **11/4/13**

SUBMITTO **SELVAGGI, FRANKO**

Work Order Comments/Details:

1/1/1970 12:00:00AM

By SELVAGGI, FRANKO: 11/4/2013 12:36:00 PM
At 7:30 p.m. city dispatch received a call that water is coming out of the manhole just west of the hillside bridge on Hillside . While Terald was enroute we received other call regarding a sewer backup @ 619 N. Washington Street. Frank advised Terald to respond to the sewer backup call 1st on Washington Street. Terald arrived on site and confirmed sewer backup. Terald then drove to Hillside and Melody and found manhole lid off in the street just west of the bridge on Hillside . He called Frank who contacted city dispatch for 1 person to assist Terald. Terald located the manhole just east of the river had heavy grease buildup not allowing water to flow towards the interceptor. Crew setup at Hillside siphon to breakup grease inside the manhole. Grease plug was about 24" in diameter and over 3ft deep inside the manhole. After about 25 mins crew was able to breakup grease and flush system, around 9:00 p.m. system was draining. While we were handing this situation Keith the owner of 4 rental units called stating all of his units were having a sewer backup. Informed him we would arrive on Main Street once the situation at Hillside and Melody was resolved. He was leaving the units and on his way home, but I did inform him I would check the units once we were done making sure the system was flowing normally with no possibility of it reoccurring while system was recovering.

Frank and Terald arrived at 630 S. Main Street @ 10:00 a.m. renter allowed us into the unit. We took photos, basement had about 1/2 of water through out. Boxes, rug with padding and some other items. (Please see photos) The remaining units (628, empty 622 and 620) no one answered the door. Also 619 S. Washington office was closed. Spoke with Keith the owner of the 4 units on Main Street told him I'll be on site at 8:00 a.m. with name of person he should contact regarding a claim. Told him it's best he speaks with them not us based on we don't know how the city reviews claim or resolves them with residents.

On Monday morning at 8:00 a.m. spoke and met with Keith the owners of the 4 units on Main Street. He had Service Master out to clean all 4 units. I entered 628 S. Main, unit was vacant, water receded, unfinished basement, see photos.

622 S. Main Street: unfinished basement, renter did have items on the ground, water had receded bout 1/2 of water at one time.

620 S. Main Street: Unfinished basement, less than 1/4 of inch at one time, water did receded; only half of the basement was effected by the water. Most of the renter's belongings were stored on the north side of the basement. Water stayed on the Southside of basement. See photos

Arrived at 619 S. Washington Street: All water had receded, owner had items throughout the basement floor, basement not finished, and water level appears to have reached approx 3" throughout the basement, near furnace and old rough out wall. Please see photos. Gave owner the phone number to contact city's claim adjuster and to address all her questions to them. Not happy.

By SELVAGGI, FRANKO: 11/5/2013 11:05:42 AM
On11-5-13 Tony recieved notification that a claim was filed for 564 S. Washington Street. Frank arrived on site at 9:45 a. m. (11-5-13) Spoke with office personal for Phili PAE & Associates CPA'S who occupy the lower level of the building. They stated, they weren't aware of any problems regarding sewer backup. Walked around the office (all on the lower level / basement) Spoke with serveral people no one had any complaints regarding smell or water on the carpet.(carpeting throughout all office space and walking area) Located furnace room towards the far westend of basement, floor drain had some evidence of problems not sure how long ago. Carpet and boxes plus dust on floor showed no backup damaged everything is dry (see photos) walk around located 2 more utility closets again no signs of sewer backups. After

speaking with people in the office who have been their since Monday morning , not sure what happen. Reviewed what happen with Tony.

By WARFEL, MICHAEL: 4/22/2014 7:47:33 AM
Changed WO Description from "TV Inspect Sewer Main" to "Customer Service Sewer" and attached the sewer main segment C11-001A>C20-044A to the work order.

Date Started Work _____ **Date Completed** _____

Restoration Required? _____ **Yes** _____ **No**

CUSTFIELDNAME	CUSTFIELDVALUE
LF TV'D	
C&P DATA ENTRY COMPLETE?	1

Field Completion Comments:

Cityworks

Inbox | Recent | New Service Request | New Work Order | Inspections | Projects | Crews | Reports | Calendar

Work Order | Email | Print | Save | Close | Delete

Work Order

Description: CUSTOMER SERVICE SEWER
Number: 79189
Entity Type: SLATERALLINE [Change]
Category: Wastewater
Initiated By: SELVAGGI, FRANKO — Date: 11/4/2013 11:04 AM
Status: CLOSED — Priority: Medium
Requested By: SELVAGGI, FRANKO — Supervisor: CONN, TONY
Submit To: SELVAGGI, FRANKO — Date: 11/5/2013 11:06 AM
Projected Start: 11/3/2013 12:00 AM — Projected Finish:
Opened By: SELVAGGI, FRANKO — Date: 11/4/2013 12:36:44 PM
Closed By: WARFEL, MICHAEL — Date: 4/22/2014 7:51:48 AM
Completed By:
Actual Start: 11/3/2013 12:00 AM — Actual Finish:
Stage: Actual — Expense Type: Maintenance

Comments: [Add Comment] [Sort ▲]

By SELVAGGI, FRANKO: 11/5/2013 11:05:42 AM
On11-5-13 Tony recieved notification that a claim was filed for 564 S. Washington Street. Frank arrived on site at 9:45 a.m. (11-5-13) Spoke with office personal for Phili PAE & Associates CPA'S who occupy the lower level of the building. They stated, they weren't aware of any problems regarding sewer backup. Walked around the office (all on the lower level / basement) Spoke with serveral people no one had any complaints regarding smell or water on the carpet.(carpeting throughout all office space and walking area) Located furnace room towards the far westend of basement, floor drain had some evidence of problems not sure how long ago. Carpet and boxes plus dust on floor showed no backup damaged everything is dry (see photos) walk around located 2 more utility closets again no signs of sewer backups. After speaking with people in the office who have been their since Monday morning, not sure what happen. Reviewed what happen with Tony.

By WARFEL, MICHAEL: 4/22/2014 7:47:33 AM
Changed WO Description from "TV Inspect Sewer Main" to "Customer Service Sewer" and attached the sewer main segment C11-001A>C20-044A to the work order.

Instructions:

Resolution: — Reactive? ☑

Details

Project: — Account:
+ Project Tree
Contract: — Contractor:
Legal Billable: ☐ — Contractor Billable: ☐
Update Map: ☐ — Cancel Work Order: ☐
Cancelled By: — Date:
Cancel Reason:
Units Accomp.: 0 — Description:
Lock Units Desc.: ☐
Labor Cost: $567.41 — Material Cost: $0.00
Equipment Cost: $153.72 — Permit Cost: $0.00
Total WO Cost: $721.13

Location Information

WO Address: HILLSIDE AND MELODY
Location Details: Main line backup 11-3-13
Shop: — Map Page:
Tile Number: 99 — District:
X Location: 1,034,644.000 — Y Location: 1,857,676.000

Assets

Total Entities: 8

Asset	Asset Id	Asset Uid	Location	Warranty Date
SGRAVITYMAIN	49575	45138	623 MELODY LN	
SLATERALLINE	209932	205842	630 S MAIN ST	
SLATERALLINE	196148	153482	628 S MAIN ST	
SLATERALLINE	209931	205839	622 S MAIN ST	
SLATERALLINE	196527	154959	620 S MAIN ST	
SLATERALLINE	196147	153478	619 S WASHINGTON ST	
SLATERALLINE	196162	154195	564 S WASHINGTON ST	
SGRAVITYMAIN	53713	49758	623 MELODY LN	

- Pink rows indicate inventory still under warranty.

Update Work Order XY when adding/removing assets? ☑

Map Layer Fields

[Reset]

Tasks

SeqID	Name	Description	Stat
1	Check City Main	Check City Main for sewer backup	COM
1	Code Brown	Flush city main to clear blockage	COM
1	Code Brown Customer	Customer Back-Up Caused by City Main Blockage	COM
2	Meet Resident	Meet with resident and give info handout.	COM
3	Code Brown Customer	Customer Back-Up Caused by City Main Blockage	COM
3	Meet Resident	Meet with resident and give info handout.	COM

Work Cycle

Repeat: Never
Interval: 6 Months
From: Actual Finish Date
Date Printed: 11/5/2013 — Next Print Date: 11/1/2013

Related Work Activities

Service Requests

Add Request:

Id	Date Initiated	Description	Priority	Category	S
178286	11/3/2013	Investigate Sewer Backup	1	WDC	C
178287	11/3/2013	Investigate Misc. Sewer Problem	1	WDC	C
178288	11/3/2013	Investigate Sewer Backup	1	WDC	C

[Remove]

Inspections

Hydraulic Sanitary Sewer Model and Capacity Assessment Schedule

1. Quality control review by managers of draft interceptor hydraulic model by previous employee – 3/15/19
2. Update model for review comments of interceptor hydraulic model – 9/13/19
    a. Work with GIS staff to field collect missing GIS data and enter into the GIS database
    b. Determine pipe reduction size for rehabilitated pipes
    c. Determine Manning's roughness values by pipe material
    d. Update all GIS field attributes such as pipe diameters and Manning's roughness values in the GIS database
    e. Import missing and updated pipe segments and junctions into InfoSWMM hydraulic model
    f. Revise Bluebird siphon as constructed in the hydraulic model
    g. Add Warrenville's Cantera force main to the hydraulic model
    h. Obtain pump curves and start up and shut off elevations from Collection and Pumping staff
    i. Add missing pump station information enter into the hydraulic model
    j. Run model and debug run errors
3. Analysis of dry and wet weather scenarios using the interceptor hydraulic model – 12/30/19
    a. Gather flow and precipitation data from SCADA and ADS FlowView
    b. Enter data into hydraulic model and create specific scenarios (example: wet weather event in spring)
    c. Run model and debug run errors
    d. Analyze results for each scenario and make recommendations to address capacity deficiencies, if any
4. Complete interceptor hydraulic model – 1/17/20
    a. Determine storage volume of lagoons
    b. Add storage volume information to hydraulic model
    c. Run model alternatives with overflow lagoons
    d. Run model and debug run errors
5. Complete hydraulic report (part 1) – 1/24/20
6. Expand interceptor model to include entire collection system by flow meter basins – 6/26/20
    a. Work with GIS staff to field collect missing GIS data and enter into the GIS database
    b. Upload GIS data into hydraulic model by individual basin (approximately 125 basins). Basins will be prioritized to be entered by those listed as severe from the ADS Environmental Annual Report which uses the flow meter and RDII data.
    c. Run model and debug run errors
    d. Calibrate entered data vs. measured flow meter data
    e. Analyze results for each basin and make recommendations to address capacity deficiencies, if any
7. Complete hydraulic report (part 2) – 7/3/20

City Of Naperville Wastewater Collection Rehabilitation Plan

	Year	Footage/Each	Estimated Cost	Locations(s)
Interceptor/Truck Sewer				
T03 North pump Station Interceptor	2019	2,200'	$1,000,000	Jefferson at Fort Hill
T03 North pump Station Interceptor	2020	2,200'	$1,000,000	Will-O-Way/ Brush Hill
T03 North pump Station Interceptor	2021	2,200'	$1,000,000	Will-O-Way/ Brush Hill
T10 McDowell Trunk Sewer	2022	2,200'	$1,000,000	McDowell
T10 McDowell Trunk Sewer	2023	2,200'	$1,000,000	McDowell
T01 Springbrook Interceptor	2024	2,200'	$1,000,000	Maywatts Park
T01 Springbrook Interceptor	2025	2,200'	$1,500,000	Maywatts Park
T01 Springbrook Interceptor	2026	2,200'	$2,500,000	Dragon Lake
T01 Springbrook Interceptor	2027	2,200'	$2,500,000	Dragon Lake
T01 Springbrook Interceptor	2028	2,200'	$2,000,000	Springbrook Crossing
Small Diameter Lining				
N16, C56	2019	14,000	$600,000	Brookdale, Market Meadow
N15, Misc. Sites	2020	14,000	$600,000	Brookdale
N15, N28,N04, N01 Misc. Sets	2021	14,000	$600,000	Brookdale, Pebble wood East
W05, Misc. Sites	2022	14,000	$600,000	Naperville Center of Commerce & Industry
W03,W04, W09, Misc. Sites	2023	14,000	$600,000	Country Lakes, Green of Country
W07, W08 Misc. Sites	2024	14,000	$600,000	Country Lakes
W10, N27, Misc. Sites	2025	14,000	$600,000	Railway Plaza. Columbia Estates
S04, Misc. Sites	2026	14,000	$600,000	The Meadows, BaileyWood
S05, Misc. Sites	2027	14,000	$600,000	The Meadows, BaileyWood
S01,S02, Misc. Sites	2028	14,000	$600,000	Vilages of West Glen, Bay Colony
Main Line Chemical Grouting				
N16, C56	2019	700 Joints	$100,000	Brookdale, Market Meadow
N15, Misc. Sites	2020	700 Joints	$100,000	Brookdale
N15, N28,N04, N01 Misc. Sets	2021	700 Joints	$100,000	Brookdale, Pebble wood East
W05, Misc. Sites	2022	700 Joints	$100,000	Naperville Center of Commerce & Industry
W03,W04, W09, Misc. Sites	2023	700 Joints	$100,000	Country Lakes, Green of Country
W07, W08 Misc. Sites	2024	700 Joints	$100,000	Country Lakes
W10, N27, Misc. Sites	2025	700 Joints	$100,000	Railway Plaza. Columbia Estates
S04, Misc. Sites	2026	700 Joints	$100,000	The Meadows, BaileyWood
S05, Misc. Sites	2027	700 Joints	$100,000	The Meadows, BaileyWood
S01,S02, Misc. Sites	2028	700 Joints	$100,000	Vilages of West Glen, Bay Colony

City Of Naperville Wastewater Collection Rehabilitation Plan

	Year	Footage/Each	Estimated Cost	Locations(s)
Lateral Rehabilitation				
C05, C06	2019	150	$1,600,000	Old Naperville,Downtown Area
C06	2020	150	$1,600,000	Old Naperville,Downtown Area
C07	2021	150	$1,600,000	Old Naperville,Downtown Area
C07	2022	150	$1,600,000	Old Naperville,Downtown Area
N25	2023	150	$1,600,000	Old Naperville,Downtown Area
N26	2024	150	$1,600,000	Old Naperville,Downtown Area
C11	2025	150	$1,600,000	Old Naperville,Downtown Area
C12	2026	150	$1,600,000	Old Naperville,Downtown Area
C13	2027	150	$1,600,000	Old Naperville,Downtown Area
N23	2028	150	$1,600,000	Midledge Farm
Lateral Grouting				
N13	2019	46	$198,000	Cress Creek
N13, N09	2020	46	$198,000	Cress Creek
N09	2021	46	$198,000	Cress Creek
N08	2022	46	$198,000	Cress Creek
N08	2023	46	$198,000	Cress Creek
N15	2024	46	$198,000	Brookdale
N15	2025	46	$198,000	Brookdale
N15	2026	46	$198,000	Brookdale
N15	2027	46	$198,000	Brookdale
N16, C56	2028	46	$198,000	Brookdale
Manhole Replacement				
N25	2019	13	$130,000	Old Naperville,Downtown Area
N26/C06	2020	35	$554,000	Old Naperville,Downtown Area, College Area
C12	2021	11	$120,000	Old Naperville,Downtown Area
C13	2022	8	$90,000	Old Naperville,Downtown Area
C20	2023	6	$75,000	East Highlands
C20	2024	6	$75,000	East Highlands
C20, C21	2025	6	$75,000	East Highlands
C21	2026	6	$75,000	East Highlands
C41	2027	6	$75,000	East Highlands
Misc. Areas	2028	6	$75,000	Misc.

City Of Naperville Wastewater Collection Rehabilitation Plan

	Year	Footage/Each	Estimated Cost	Locations(s)
Manhole Rehabilitation				
N25	2019	35	$112,000	Old Naperville,Downtown Area
N26	2020	50	$150,000	Old Naperville,Downtown Area
N26,	2021	50	$150,000	Old Naperville,Downtown Area
C05	2022	50	$150,000	Old Naperville,Downtown Area
C05	2023	50	$150,000	Old Naperville,Downtown Area
C06	2024	50	$150,000	Old Naperville,Downtown Area
C06	2025	50	$150,000	Old Naperville,Downtown Area
C12, C13	2026	50	$150,000	Old Naperville,Downtown Area
C20	2027	50	$150,000	East Highlands
C20	2028	50	$150,000	East Highlands
Manhole Upper Structure				
C12, C13, C41,C20, C21	2019	275	$353,789	Old Naperville,Downtown Area, East Highlands
N16, Misc. Manholes	2020	200	$290,000	Brookdale
N15, Misc. Sites	2021	200	$290,000	Brookdale
N15, Misc. Sites	2022	200	$290,000	Brookdale
N15, Misc. Sites	2023	200	$290,000	Brookdale
W06, Misc. Sites	2024	200	$290,000	Longwood
W06, Misc. Sites	2025	200	$290,000	Longwood
N04, Misc. Sites	2026	200	$290,000	Country Lakes, Green of Country
W09, Misc. Sites	2027	200	$290,000	Country Lakes, Green of Country
W03, W05, Misc. Sites	2028	200	$290,000	Naperville Center of Commerce & Industry
Inverted Siphons				
Bluebird	2021	Each	$350,000	
Edgewater	2022	Each	$300,000	
Tollway	2023	Each	$300,000	
TBD	2024	Each	$300,000	

City Of Naperville Wastewater Collection Rehabilitation Plan

	Year	Footage/Each	Estimated Cost	Locations(s)
Lift/Pump Station				
Northwest Pump Station	2020	Each	$400,000	River Rd/Ogden Ave
Southwest Pump Station	2021	Each	$300,000	Hassert Blvd
Summerfield Pump Station	2022	Each	$225,000	Mission Oaks
Trillium Pump Station	2023	Each	$225,000	Trillium Lane
Bonnema Woods Pump Station	2024	Each	$225,000	Bonnema Woods
Country Lakes Pump Station	2025	Each	$300,000	Country Lakes
West Highlands Pump Station	2026	Each	$300,000	West Highlands
Century Hill Pump Station	2027	Each	$300,000	Century Hill
Cinnamon Creek Pump Station	2028	Each	$300,000	75th/Ranchview
Hobson Oaks Pump Station	2029	Each	$300,000	Hobson Oaks
* **Reviewed and adjusted as needed annually**				

City of Naperville
Department of Public Utilities- Water/Wastewater
Sanitary Sewer Asset Management Strategy
December 2019

Revision	Date

Table of Contents

1. Introduction
   1.1 Purpose of the Asset Management Strategy
   1.2 Level of Service
   1.3 Asset Inventory

2. Asset Business Risk Exposure Methodology
   2.1 Probability of Failure Score
   2.2 Consequence of Failure Score
   2.3 Business Risk Exposure Score

3. Capital Improvement Plan

4. Long Range Funding Strategy

5. Future Expansion of the Asset Management Strategy

DRAFT

1. INTRODUCTION

1.1 Purpose of the Asset Management Strategy

Asset management is a continuous process that guides the acquisition, use, and disposal of infrastructure assets. The purpose of asset management is to optimize service delivery and minimize the cost of any given asset over its service life. The City of Naperville asset management strategy is structured around three principles:

- Customer service
- Asset life cycles and risk management
- Life cycle costing

The goal of the asset management strategy is to achieve desired levels of service and operational objectives at the best possible cost to the customer.

The City has an ongoing asset management program for sanitary sewer assets. Data from the City's GIS system, CMMS system (Cityworks), flow monitoring program and CUES Granite Net CCTV inspection records are used to assess the condition of various assets. The CMMS system also contains a database of cleaning, inspection, lining, spot repairs and other maintenance and repair activities.

The City uses a risk-based approach to analyze and prioritize maintenance and repairs to the sanitary sewer system. Data collected from the various systems, including GIS, Cityworks, CUES, and InfoSWMM is used to develop Probability of Failure (PoF) and Consequent of Failure (CoF) criteria for each sanitary sewer collection system asset. These criteria are used to calculate a Business Risk Exposure (BRE) score for each asset. The BRE score is used to help target the City's resources in the most efficient way possible to optimize performance of the collection system, to eliminate SSO's and other system problems.

1.2 Level of Service

A desired Level of Service will be used as the measurable outcome for the Asset Management Strategy.

Level of Service goals are as follows:

Regulatory Compliance. No signification NPDES permit violations. No USEPA or IEPA Notices of Violation. *Goal: No violations.*

Public Confidence/System Service Impact. Minimal loss of service or impacts to other services. No sanitary sewer overflows (SSOs) into homes, businesses or waterways. Minor disruptions (eg traffic, noise, dust). *Goal: Reduce service interruptions. Reduce complaints. No SSOs.*

Safety of Public and Employees. No reportable injuries. No lost-time injuries or medical attention required. No impact to public health. *Goal: no injuries or public health advisories.*

DRAFT

Business Risk Evaluation (BRE) Score. Assess condition of system assets to develop a BRE score for each asset. *Goal: Reduction in BRE scores across the system*.

1.3 Asset Inventory

The City of Naperville's Wastewater Collection system includes:

- 2,692,818 linear feet (510 miles) of gravity sewer and interceptors
- 12,059 manholes
- 22 lift/pump stations
- 43,349 linear feet (8.21 miles) of force mains
- 42,221 customers

The diameter of sanitary sewer mains ranges in sizes from 6-inches to 60-inches, depending upon the type and location of the pipe. Sewer piping construction materials consist of vitrified clay pipe (VCP), polyvinyl chloride (PVC) pipe, ductile iron pipe (DIP), reinforced concrete pipe (RCP), asbestos cement pipe and cast-iron pipe.

The system includes two (2) permitted interceptors that convey sewage to the Springbrook Water Reclamation Center (SWRC). Each interceptor has specified tributary areas that include smaller trunk sewers, sewer main lines and pump stations/forcemains. Both interceptors are constructed of reinforced concrete pipe (RCP).

The age, construction system/material, elevations and other key information is recorded in the City's geographic information system (GIS). Design plans are stored in the City's OnBase records management system and all maintenance history of each section of sewer, forcemain, interceptor, manhole and lift station are recorded in the City's CMMS.

Below is the current pipe material breakdown of the Collection System:

City of Naperville Water Utilities Pipe Material 2019		
PIPE MATERIAL	**GRAVITY MAINS**	**FORCEMAINS**
Asbestos Cement Pipe	0.5%	0%
Cast Iron	0.5%	0%
Non-Reinforced Concrete Pipe	0.5%	0%
Ductile Iron	3.5%	77.5%
High Density Polyethylene (HDPE)	0.5%	1.5%
Polyvinyl Chloride (PVC)	40%	8.5%
Reinforced Concrete Pipe (RCP)	3%	0%
Steel Pipe	0%	10%

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Truss Plastic	1.5%	0%
Vitrified Clay Pipe (VCP)	28.5%	0%
Cured-In-Place Pipe (CIPP)	21.5%	2.5%
Total	100.0%	100%

2. Asset Business Risk Exposure Methodology

Business Risk Exposure (BRE) scores will help the Utility prioritize pipes "worst first", as well as prioritizing acceptable level of service for critical facilities.

Two sets of criteria were developed to calculate the BRE of an asset: Probability of Failure and Consequence of Failure.

Probability of Failure captures criteria likely to cause a failure of the pipe, such as pipe material, age and maintenance history.

Consequence of Failure captures criteria such as pipe size, difficult to repair locations, and number of customers served. Siphons and divertibles were also given special scores due to their functions within the system.

After the criteria was enumerated and ranked, each criteria was given a weight to indicate its importance to the probability of failure and consequence of failure calculation. A higher weight indicates a more important criteria.

2.1 Probability of Failure Score

Several Probability of Failure criteria were evaluated. The first criteria incorporated was pipe material. Pipe materials were given a score corresponding to the stability, longevity and strength of the material. Materials with the highest scores indicate poorer materials more prone to failure. Pipe material was given a weight of 2 in the calculation of the BRE.

Material	Score
Asbestos Cement	10
Cast Iron	4
Concrete Pipe (Non Reinforced)	8
Ductile	4
Polyethylene	1
PVC	1
Reinforced Concrete	6
Reinforced Plastic (Truss)	9
Vitrified Clay	10

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CIPP	2
Fold In Form	6

The second criteria considered was age of the pipe. In general, older pipes were given worse scores. The age brackets with the worst score of 10 reflect construction practices during times of rapid growth in the city. Asset age is weighted as 3 in the calculation of BRE.

Asset Age (years)	Score
118-109	9
108-99	9
98-89	9
88-79	9
78-69	9
68-59	9
58-49	10
48-39	10
38-29	7
28-19	3
18-9	2
9-0	1

The third criteria considered is maintenance, to include both history and frequency. Pipes requiring more frequent maintenance were given the worst scores. For example, pipes requiring monthly rootsawing were scored the worst at a 10. This category is weighted a 1 in the BRE calculation.

Maintenance	Score
Rootsaw -Monthly	10
Rootsaw -Quartely	8
Rootsaw - Semi - Annual	7
Rootsaw - Annual (1-2 year Cycle)	5
Flush - Monthly	5
Flush - Quartely	4
Flush - Semi - Annual	4
Flush - Annual	3
Flush - 2-3 Years	2
Flush - 4-5 Years	1

2.2 Consequence of Failure Score

DRAFT

Several Consequence of Failure criteria were evaluated. The first criteria was pipe size. Larger pipes were given a higher score, as the consequence of their failure is more severe. These pipes carry greater volumes and service larger numbers of customers. Pipe size was given a weight of 4 in the BRE calculation.

Diameter (in)	Score
3	4
4	4
6	6
8	6
10	6
12	8
14	8
15	9
16	9
18	9
20	9
21	9
24	9
27	9
30	9
33	9
36	10
42	10
48	10
60	10

The second criteria evaluated was pipe location. Pipes with a higher score have a higher consequence of failure. Pipes with higher scores may be in locations that are difficult to access and repair, could cause disruption to transportation facilities, could cause environmental damage, have unknown connection or bottlenecks. Pipe location was given a weight of 5 in the BRE calculation.

Location	Score
None	1
Interstate, RR, River (50 foot)	10
Blind Ties (upstream)	5
Bottlenecks	8

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Number of customers was also evaluated as a criteria. Higher scores indicate a greater number of customers will be impacted by a failure of the asset. Number of customers was given a weight of 3 in the BRE calculation.

Number of Customers	Score
0	1
1-5	4
6-10	6
11-15	8
15+	10

Special system features were enumerated in the BRE calculation. Siphons and divertibles were given consequence of failure scores due to their critical functions in the system. Single barrel siphons represent a single point of failure and have the highest score. Divertibles serve a specific system function during high flows or downstream disruption. Siphons are given a weight of 2 and divertibles a weight on 1 in the BRE calculation.

Siphon	Score
Single	10
Double	5
Triple	1

Divertible	Score
Yes	3
No	1

2.3 Business Risk Exposure Score

The Probability of Failure and Consequence of Failure scores are multiplied together to yield a Business Risk Exposure score.

$$PoF \times CoF = BRE$$

BRE scores fall in the range of 1.50 to 59.42. The higher the BRE score, the greater the risk if the asset were to fail. A color-coded map of the system BRE scores is included as Figure 1.1. Assets with the highest scores, and therefore the greater risk, are coded dark red.

The system BRE scores have been divided into percentiles to indicate the range of scores in the system. A mean BRE score of 13.82 was also calculated. One percentile point represents approximately xx feet of pipe.

Percentile	Score
95th	30.77
90th	29.62

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85th	28
80th	24.77
70th	19.62
60th	12.92
50th	8.31
40th	7.38
30th	6.46
20th	5.54
10th	4.85

Mean:	13.82

BRE scores will help the Utility prioritize pipes "worst first", as well as prioritizing acceptable level of service for critical facilities.

Several observations can be made by examining the BRE map. First, areas with large amounts of sewer lining have better BRE scores than areas that have not been lined; so even though the original sanitary sewers in these areas may be older they have better BRE due to the lining. Second, it is easy to identify the interceptors or larger-diameter sewers because their color scheme indicates an increased risk due to their size. Other observations

3. Capital Improvement Plan

The Capital Improvement Plan (CIP) provides a guide to identify long-term needs, improvements, rehabilitation and replacement needs for the Wastewater Utility for a period of 10 years. The CIP will allow the utility to plan and budget for these expenditures and consider the anticipated project costs during the rate-making process.

Infrastructure improvement priorities have been developed based on current evaluation of the system. Specific program areas are shown on the CIP, with corresponding details such as number of manholes or feet of pipe. The 10-year CIP is shown in Figure X.

The proposed Capital Improvement Project funding levels per year are summarized as follows:

Year	Program Cost
2019	
2020	
2021	
2022	
2023	

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2024	
2025	
2026	
2027	
2028	
Total:	

In 2019, all of the rehabilitation targets were met. Actual CIP spending on the sanitary sewer rehabilitation program was $xxx. The funding of sanitary sewer system rehabilitation represented xx% of the total CIP in 2019.

4. Long Range Funding Strategy

The City of Naperville performs rate studies every three to five years to develop cost of service rates that are fair and transparent for each customer class, as well as ensure that stable funding is available to operate and maintain the sanitary sewer assets. In 2020, the City will be in the fourth year of the previous rate study conducted in 2016. In 2020 the City will conduct a new rate study to set water and wastewater rates to take effect in January 2021. It is anticipated that the rates will be set for a three-year period.

Wastewater rate setting will involve an examination of the level of capital improvements required to maintain and improve the level of service in the sanitary sewer system, address deficiencies that may be identified, as well as comply with current regulations and prepare for future regulations.

The current collection system rehabilitation and maintenance program is currently funded pay-as-you go each year by the wastewater rates. It is anticipated that this funding structure will continue into the future.

5. Future Expansion of the Asset Management Strategy

The current Asset Management Strategy is focused on gravity sanitary sewer piping, including the manholes on the piping segments. In the future, sanitary sewer lift stations and forcemains will be evaluated and added to the Asset Management Strategy. We anticipate that these assets will be added in 2020 and 2021.

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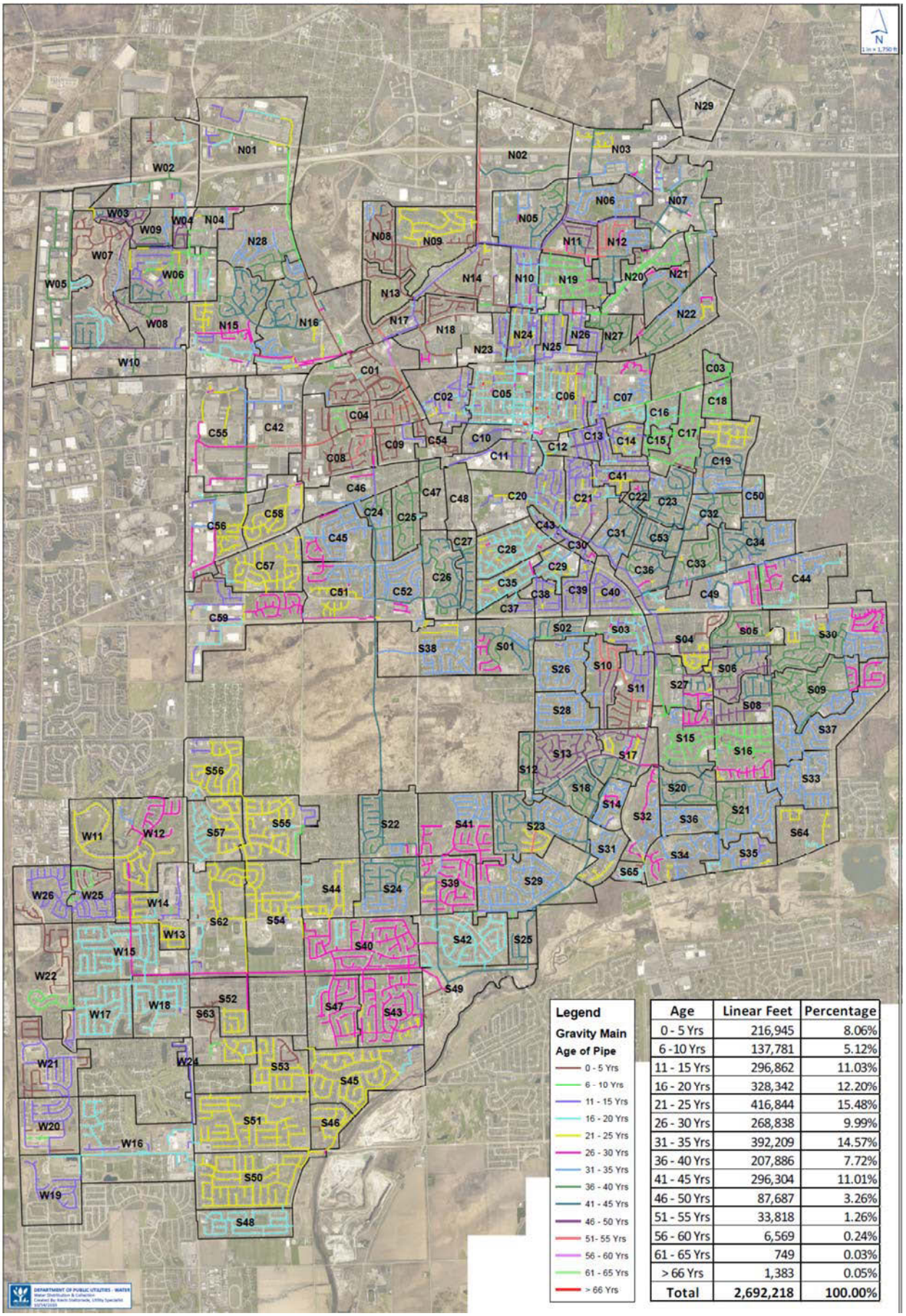
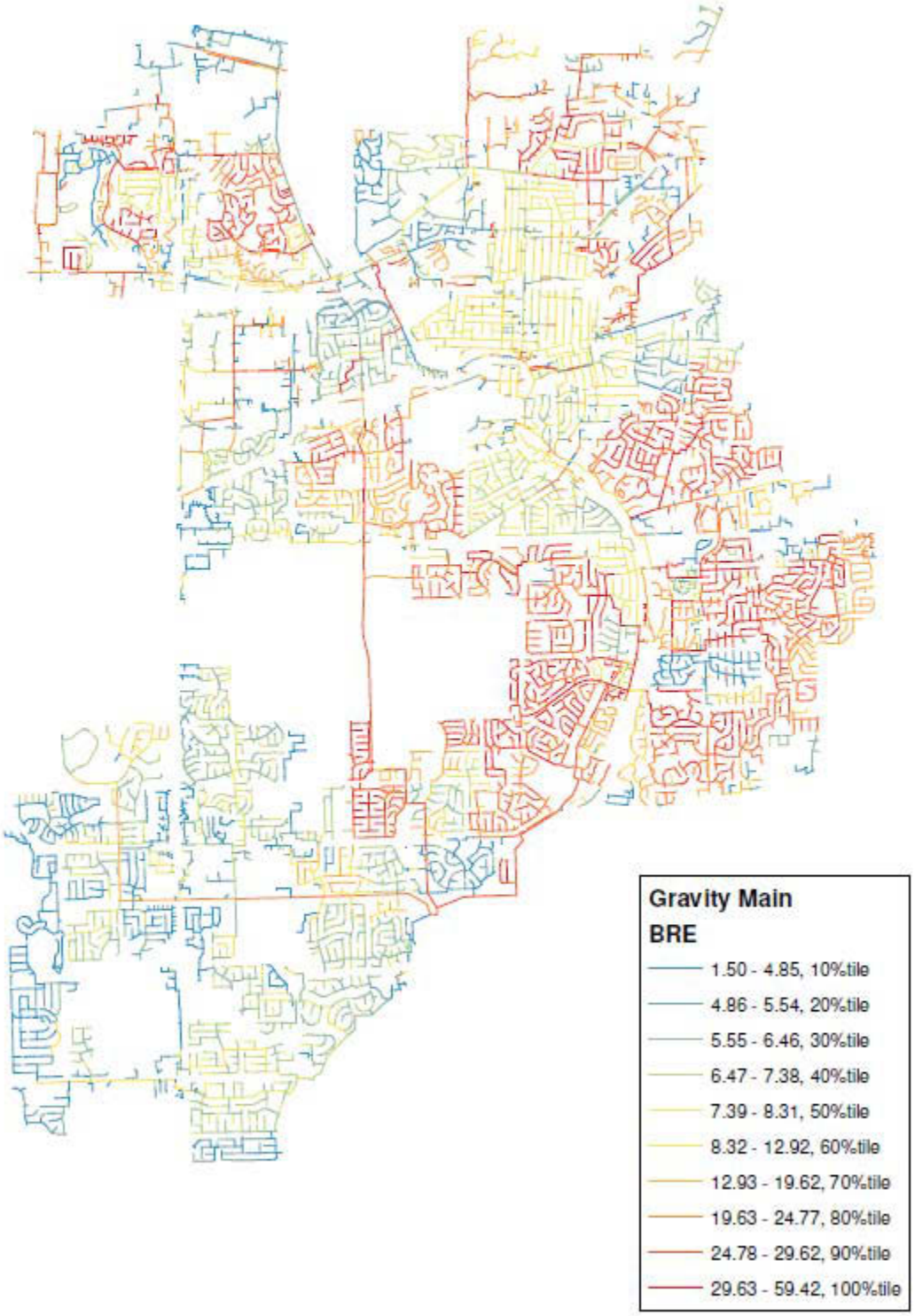
Sanitary Gravity Main Age



Age	Linear Feet	Percentage
0 - 5 Yrs	216,945	8.06%
6 -10 Yrs	137,781	5.12%
11 - 15 Yrs	296,862	11.03%
16 - 20 Yrs	328,342	12.20%
21 - 25 Yrs	416,844	15.48%
26 - 30 Yrs	268,838	9.99%
31 - 35 Yrs	392,209	14.57%
36 - 40 Yrs	207,886	7.72%
41 - 45 Yrs	296,304	11.01%
46 - 50 Yrs	87,687	3.26%
51 - 55 Yrs	33,818	1.26%
56 - 60 Yrs	6,569	0.24%
61 - 65 Yrs	749	0.03%
> 66 Yrs	1,383	0.05%
Total	**2,692,218**	**100.00%**

Figure 1.1 Gravity Main Business Risk Exposure (BRE) percentiles



Strand Associates, Inc.®
910 West Wingra Drive
Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

November 19, 2019

Mr. Joe Slevnik
City of Naperville
3612 Plainfield-Naperville Road
Naperville, IL 60566

Re: Ultimate Wastewater Flow and Loading Evaluation
City of Naperville (City), Illinois

Dear Joe,

Enclosed are three copies of the final Ultimate Wastewater Flow and Loading Evaluation report. Strand Associates, Inc.® looks forward to opportunities to continue assisting the City as it plans for its future wastewater needs.

Please call us with questions at 608-251-4843.

Sincerely,

STRAND ASSOCIATES, INC.®

Troy W. Stinson, P.E.

Nicholas A. Bartolerio, P.E.

Enclosure: Report

TWS:NAB:sjl\R:\MAD\Documents\Reports\Archive\2019\Naperville, IL\Ultimate WW Flow and Loading Eval.1216.005.NAB.Nov\Report\Technical Report.docx\111919

Report for

City of Naperville, Illinois

Ultimate Wastewater Flow and Loading Evaluation

STATE OF ILLINOIS
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REGISTERED
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Troy W. Stinson
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November 2019

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INTRODUCTION

The City of Naperville (City) owns and operates the Springbrook Water Reclamation Center (SWRC), a 26.25-million-gallon-per-day (MGD) design average flow (55-MGD design maximum flow) treatment plant that receives wastewater from the City along with the neighboring City of Warrenville.

The SWRC is divided into two plants: the 22.5-MGD design average flow North Plant that contains six aeration tanks (with four zones per tank) with vertical turbine aerators/mixers, and the 3.75-MGD design average flow South Plant that contains one aeration tank with diffused aeration. Biosolids treatment at the SWRC consists of waste activated sludge (WAS) thickening with a gravity belt thickener (GBT), aerobic digestion, and centrifuge dewatering of aerobically digested sludge. Both the North and South Plants currently use a conventional activated sludge process (without primary clarification) designed for biochemical oxygen demand (BOD) removal and nitrification.

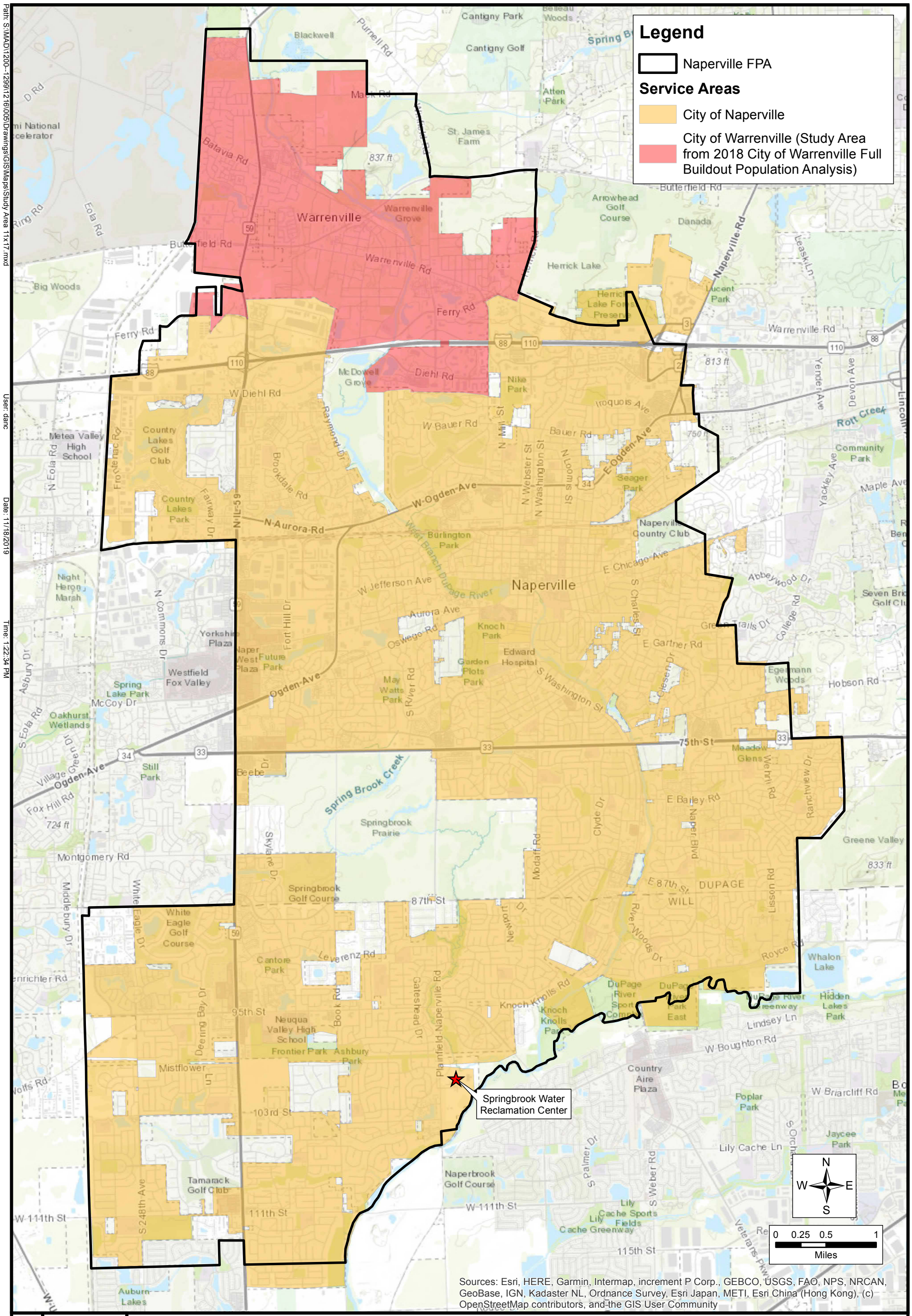
The SWRC service area is mostly developed; however, there are some areas that may be developed in the future that would contribute to flows and loadings to the SWRC. As an initial step in planning for future needs at the SWRC, the City is evaluating existing flows and loadings to the facility, potential areas for future development, and their corresponding future flows and loadings to the SWRC to establish future design criteria. This evaluation summarizes these evaluations and presents future flow and loading projections for the SWRC.

STUDY AREA

The current sewer service area for the SWRC along with municipal boundaries for the City and the City of Warrenville are presented in Figure 1. The Naperville Facility Planning Area (FPA) boundaries as of the April 1, 2014 (after which the Illinois Environmental Protection Agency [IEPA] stopped approving FPA boundary changes) are also shown. The IEPA defines FPA as “a centralized sewer service area to be considered for possible wastewater treatment facilities within a 20-year planning period”. While the IEPA has not eliminated the FPA process, it has indicated that it no longer denies construction permits based on inconsistency with FPA boundaries or updates FPA maps. Therefore, the City could potentially provide wastewater service to parcels outside of its FPA, and likewise, other entities could provide wastewater service to unincorporated parcels within the Naperville FPA. The FPA boundaries generally follow the City boundaries in the southern portion of the FPA, with the exception of a few unincorporated areas that are also included in the FPA. In the northern portion of the FPA, there are large areas northeast of the City of Warrenville that are not currently incorporated. There are also many small areas within the extents of the City limits that are unincorporated and not served by the SWRC. Separate evaluations were conducted of the potential increase in wastewater flow and loadings to the SWRC based on planned development and potential population growth within the existing service area as well as the entire Naperville FPA.

EXISTING FLOW EVALUATION

Influent flow to the SWRC is measured continuously with three electromagnetic flow meters downstream of the influent pumps. The following sections describe the evaluation of existing flow data and the determination of per capita flows for use in future flow projections.



Path: S:\MADI\1200--1299\1216\005\Drawings\GIS\Maps\Study Area 11x17.mxd
User: danc
Date: 11/18/2019
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FIGURE 1
1216.005

STUDY AREA

ULTIMATE WASTEWATER FLOW AND LOADING EVALUATION
CITY OF NAPERVILLE
DUPAGE AND WILL COUNTIES, ILLINOIS

A. Influent Flow Evaluation

Influent flows from January 2015 to August 2019 were evaluated to establish existing flows to the SWRC under various conditions. A summary of the influent flow from this period is presented in Table 1 and Figure 2. Over this 56-month period, the average influent flow was approximately 20 MGD. To evaluate existing peak flows, 7-day and 30-day rolling averages were calculated to approximate maximum week and maximum month conditions. The 7-day and 30-day rolling averages are presented in Figures 3 and 4, respectively. The highest 30-consecutive day average flow over this period occurred from April 30, 2019 through May 29, 2019, with an average influent flow of 32.22 MGD. The highest 7-consecutive-day average flow over this period occurred from April 29, 2019 to May 5, 2019, with an average influent flow of 43.42 MGD. The day with the highest influent flow over this period was May 1, 2019, with a total measured flow of 57.94 MGD. A more detailed analysis of peak flow data is presented in the following section.

	Influent Flow (MGD)					
	2015	**2016**	**2017**	**2018**	**2019***	**2015 to 2019**
Average Day	19.60	19.85	19.82	19.23	22.73	**20.07**
Maximum Month (30-day maximum)	25.57	27.36	27.32	25.40	32.22	**32.22**
Maximum Week (7-day maximum)	32.55	34.95	36.65	37.18	43.42	**43.42**
Maximum Day	43.96	46.40	56.08	54.93	57.94	**57.94**

*Note: 2019 data through August

Table 1 Influent Flow Summary

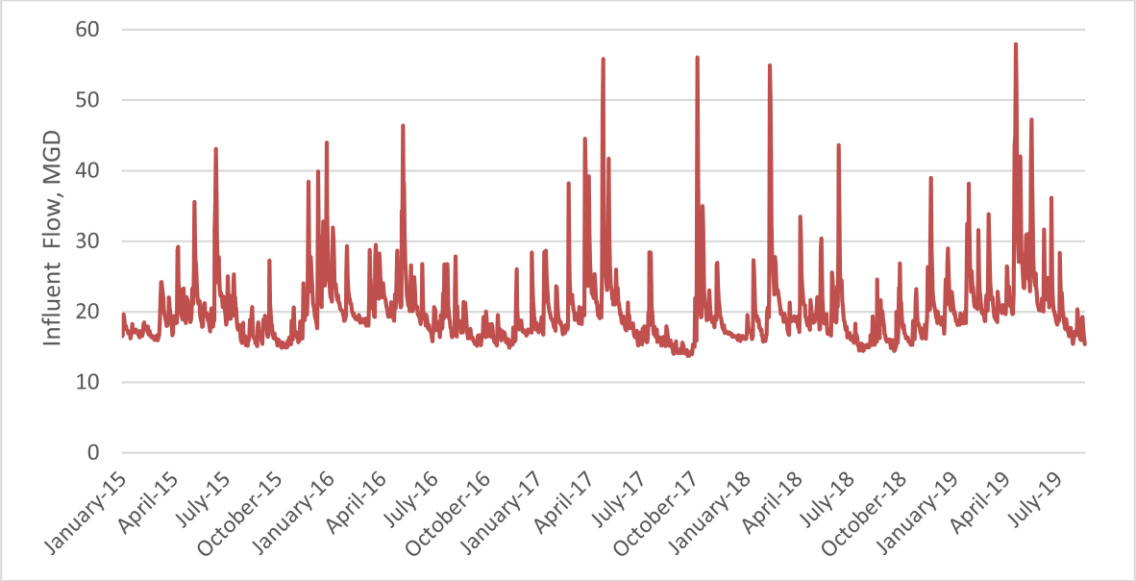

Figure 2 Daily (24-Hour Average) Influent Flow: January 2015 to August 2019

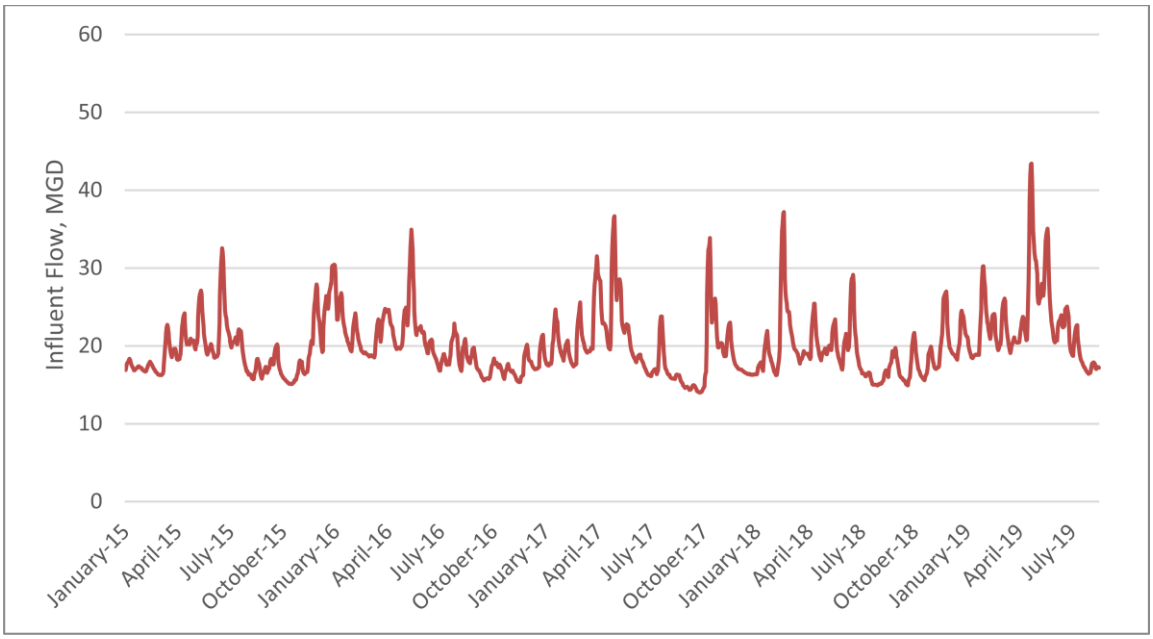

Figure 3 Influent Flow 7-Day Rolling Average: January 2015 to August 2019

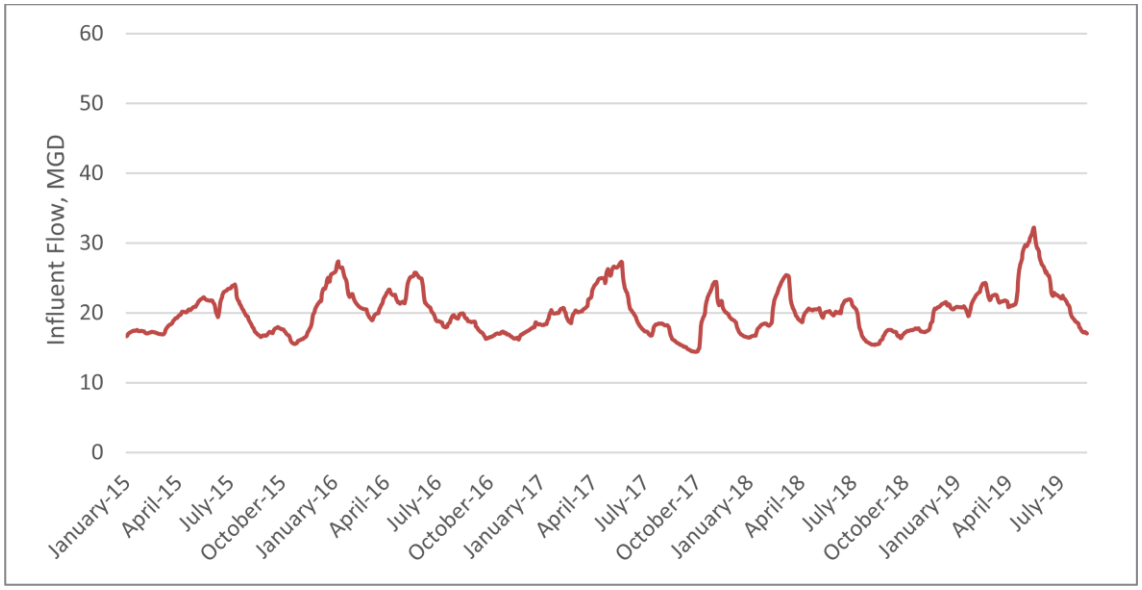

Figure 4 Influent Flow 30-Day Rolling Average: January 2015 to August 2019

B. Peak Wet Weather Event Evaluation

Between January 2015 and August 2019, there were six days with a total recorded influent flow over 50 MGD, as presented in Table 2. These six high flow days include two sets of consecutive days, resulting in a total of four wet weather events that were used in the evaluation of peak influent flows to the SWRC.

Date	Total Daily Flow (MGD)
May 1, 2019	57.94
October 15, 2017	56.08
May 1, 2017	55.83
February 20, 2018	54.93
May 2, 2019	51.06
February 21, 2018	50.58

Table 2 Maximum Flow Days: January 2015 to August 2019

Instantaneous influent flow data (recorded every three minutes in the SWRC supervisory control and data acquisition [SCADA] system) for the four wet weather events, including at least 24 hours before and following the recorded high flow days, was used to determine the highest recorded instantaneous influent flow for each period as well as the maximum 24-hour rolling average influent flow and maximum 60-minute rolling average influent flow. The 60-minute rolling average influent flow is used to determine the peak hour flow that is important for sizing several treatment processes. Because several of these wet weather events spanned several calendar days, the 24-hour rolling average provides a better indication of a maximum day flow than the highest reported calendar day flow. A summary of the four wet weather events, including the peak instantaneous flow recorded at the SWRC and the maximum 24-hour and 60-minute rolling average flows for each event, are presented in Table 3. City staff indicate that the

maximum influent pumping capacity of the SWRC was originally 72 MGD, but the capacity may have been reduced as the result of a change in the upstream hydraulic profile in the recent grit removal project. Furthermore, the existing pump controls will automatically operate a maximum of six of the eight influent pumps: one of the two pumps dedicated to the South Plant and five of the six pumps dedicated to the North Plant. The flow to the South Plant is typically limited to approximately 10 mgd and, therefore, the pump dedicated to the South Plant may not automatically run at full speed during high flows. As seen in Figures 5 through 8, it appears that the recorded influent flow plateaus around 65 MGD, which may indicate that the controlled pumping capacity was reached and instantaneous flows higher than the recorded values have been conveyed to the SWRC and temporarily stored in the collection system. This will be evaluated in more detail later in this section.

Wet Weather Event Period	Total Daily Flow (MGD)	Maximum Day Flow: 24-Hour Rolling Average (MGD)	Peak Hourly Flow: Maximum 60-Minute Rolling Average (MGD)	Peak Instantaneous Flow (MGD)
April 30, 2019 to May 4, 2019	45.03 (April 30, 2019) 57.94 (May 1, 2019) 51.06 (May 2, 2019) 43.67 (May 3, 2019) 33.11 (May 4, 2019)	58.54	62.68	64.34
October 13, 2017 to October 17, 2017	15.89 (October 13, 2017) 44.01 (October 14, 2017) 56.08 (October 15, 2017) 39.63 (October 16, 2017) 30.83 (October 17, 2017)	61.42	65.64	67.43
April 29, 2017 to May 3, 2017	24.44 (April 29, 2017) 48.32 (April 3, 2017) 55.83 (May 1, 2017) 40.38 (May 2, 2017) 31.99 (May 3, 2017)	56.76	64.74	65.77
February 19, 2018 to February 23, 2018	24.47 (February 19, 2018) 54.93 (February 20, 2018) 50.58 (February 21, 2018) 41.00 (February 22, 2018) 32.71 (February 23, 2018)	56.75	62.45	63.70

Table 3 Influent Flow Summary

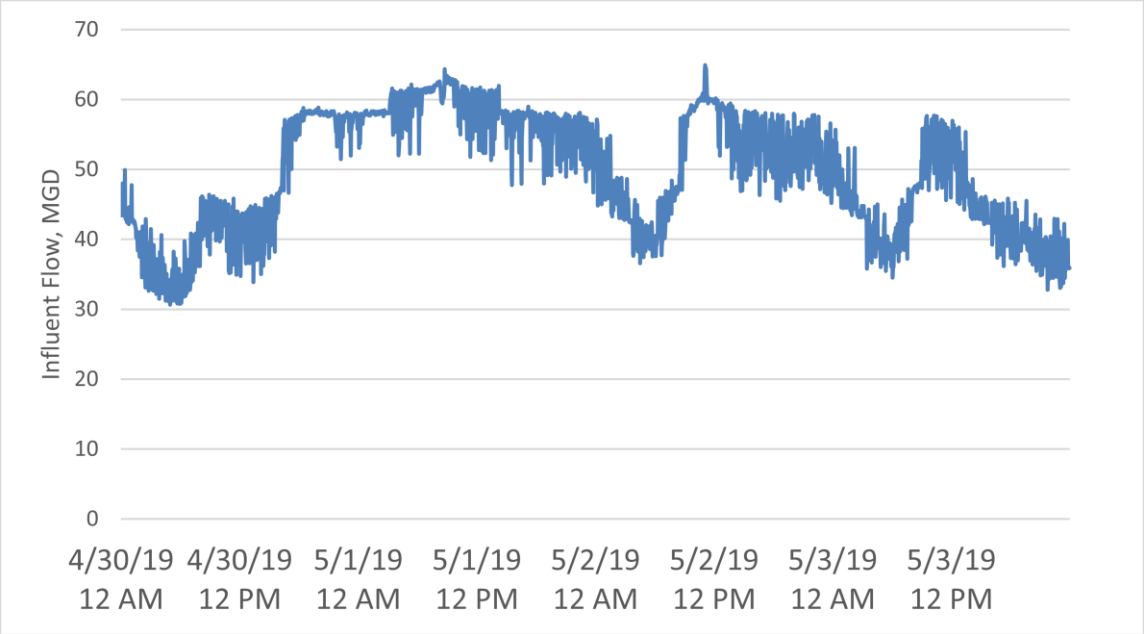

Figure 5 Instantaneous Influent Flow: April 30, 2019 to May 4, 2019

Figure 6 Instantaneous Influent Flow: October 13, 2017 to October 17, 2017

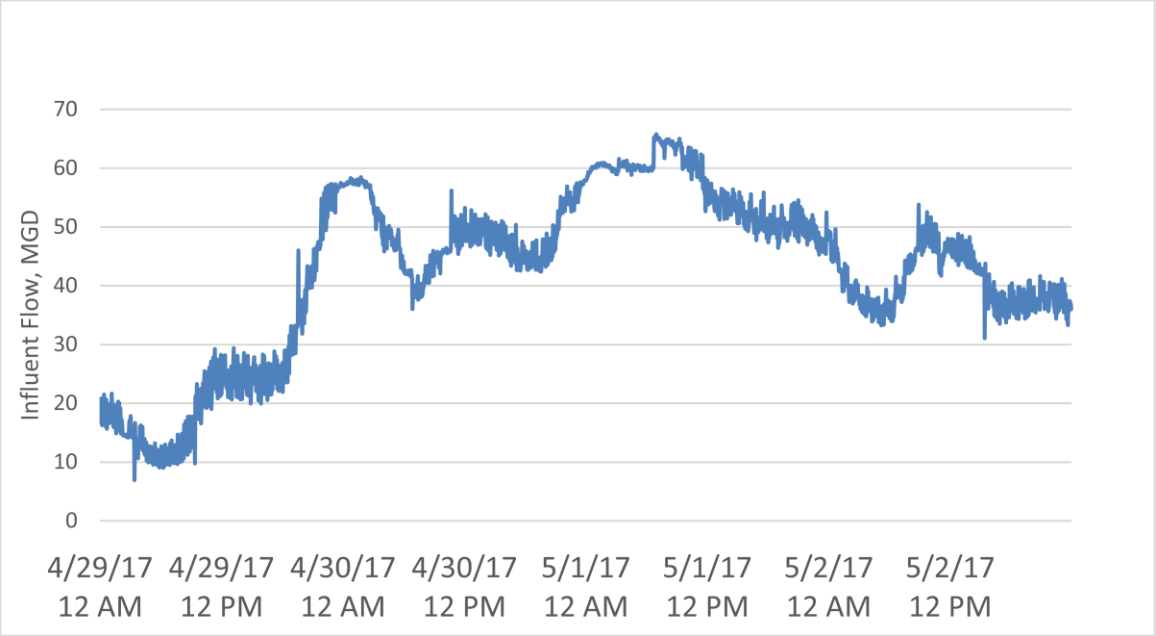

Figure 7 Instantaneous Influent Flow: April 29, 2017 to May 3, 2017

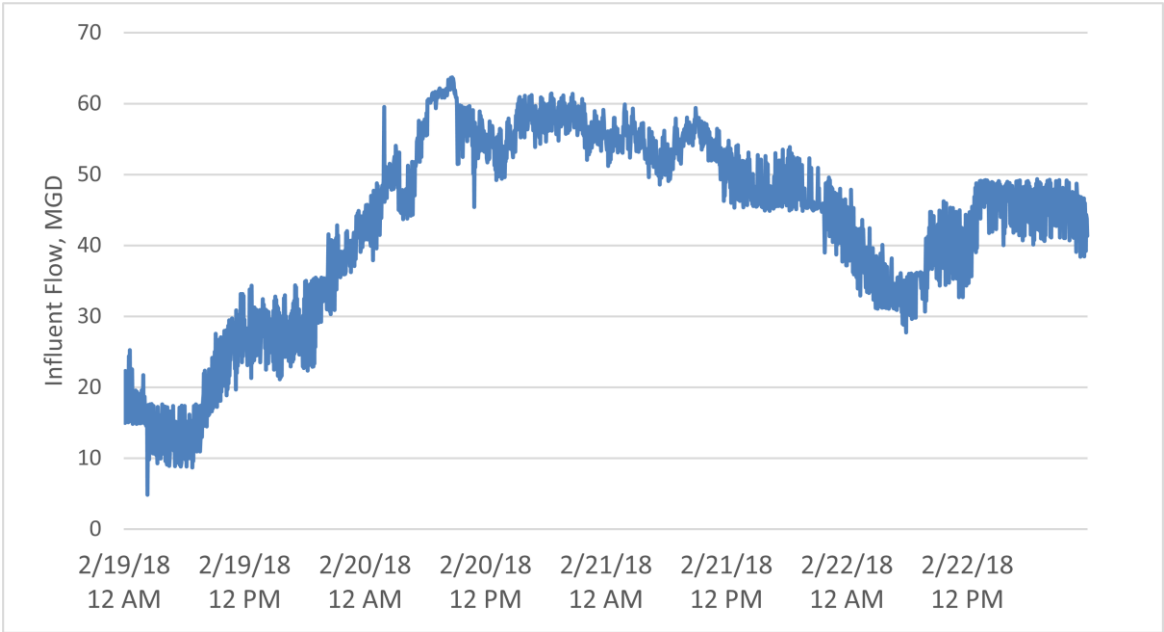

Figure 8 Instantaneous Influent Flow: February 19, 2018 to February 23, 2018

Because influent flow to the SWRC is measured downstream of the influent pumps, there is the potential for the measured influent flow to be limited by the pumping capacity, thereby understating the actual flow to the facility. Measurements of the influent wet well level and influent pump speed were evaluated for these wet weather events to assess the potential for this condition. The highest peak instantaneous

influent flow measurement during the period evaluated in this report occurred on October 14, 2017, with a measured flow of 67.43 MGD. Figure 9 presents the influent flow from October 13, 2017 to October 17, 2017 along with the water depths in the influent wet well and the number of pumps running throughout the period. As shown, the influent wet well level rose significantly just before the sixth influent pump started, indicating that the influent flow was exceeding the pumped flow of approximately 61 MGD during this period. At that time, four pumps were pumping to the North Plant at 100 percent speed and one pump was pumping to the South Plant at 80 percent speed. Once the fifth pump to the North Plant started at a wet well depth of approximately 12.3 feet, the maximum instantaneous flow measurement of 67.43 MGD occurred. With six pumps in operation (five to the North Plant at 100 percent speed and one to the South Plant at 83 percent speed), the influent wet well level continued to drop as pumped flow was maintained in the range of 65 to 67 MGD. There were three brief periods later during this wet weather event in which the wet well levels rose, indicating that the influent flow to the facility exceeded the flow being pumped. However, these events were brief and as the pumping capacity increased to approximately 64 MGD with the higher wet well levels (through reduced head on the influent pumps), the wet well levels subsided. There was a short period (approximately 1.5 hours) before the sixth influent started that the wet well levels increased rapidly during which there was potential for storage in the upstream collection system. However, the rapid decrease in wet well levels once the sixth pump started suggests that the maximum instantaneous flow measurement of 67.43 MGD is a good approximation of the existing peak flows to the SWRC. However, the capacity of the existing influent sewers is likely limiting peak flows to some degree. Collection system modeling and obtaining invert elevations of existing influent sewers would be necessary to better predict future peak flows to the SWRC in relation to the collection system storage lagoon operation.

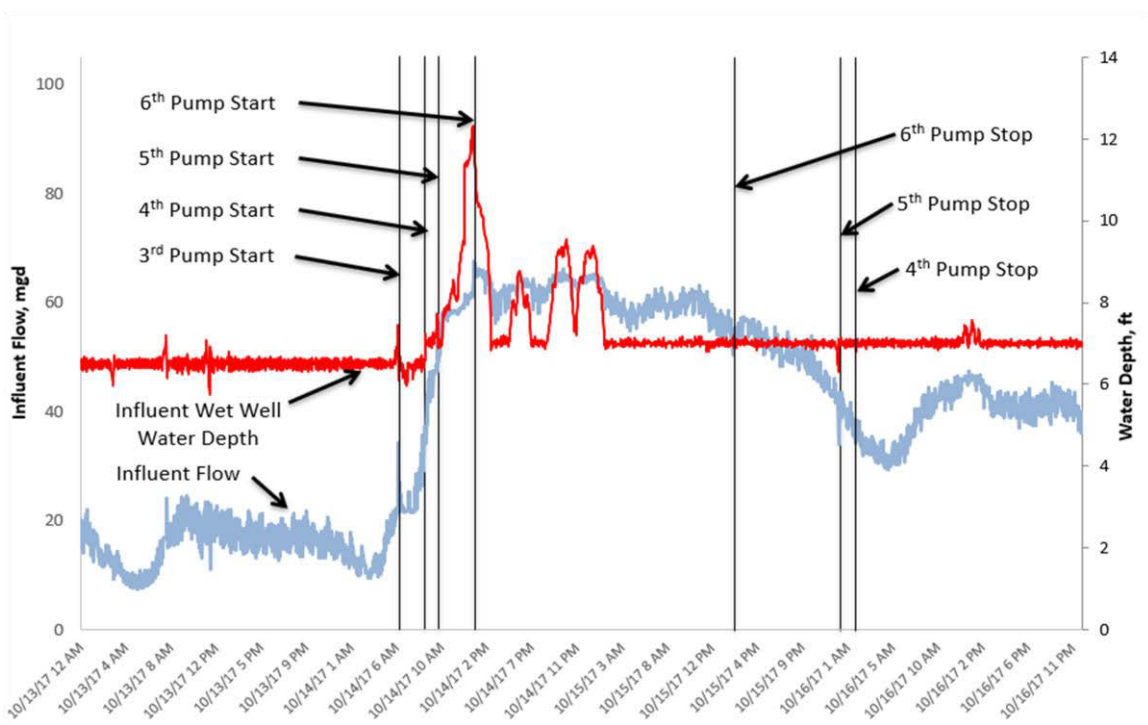

Figure 9 Influent Flow and Wet Well Levels: October 13, 2017 to October 17, 2017

Peaking factors for the maximum month, maximum week, maximum day, peak hour, and peak instantaneous flows were calculated based on the data presented in Tables 1 and 3. Maximum day and peak instantaneous flows used for the determination of peaking factors for 2017 to 2019 are based on the wet weather event data summarized in Table 3. No peak instantaneous flow data was analyzed for 2015 and 2016 because there were no peak flow events in these years that were similar in intensity to those experienced in 2017 through 2019.

	2015	2016	2017	2018	2019*
Maximum Month (30-day maximum)	1.3	1.4	1.4	1.3	1.4
Maximum Week (7-day maximum)	1.7	1.8	1.8	1.9	1.9
Maximum Day (24-hour maximum)	-	-	3.1	3.0	2.6
Peak Hour (60-minute maximum)	-	-	3.3	3.2	2.8
Peak Instantaneous	-	-	3.4	3.3	2.9

*Note: 2019 data through August

Table 4 Influent Flow Peaking Factor Summary

C. Collection System Storage Lagoons

The City owns and operates two wet weather flow storage lagoons in its collection system: a 4.6-million-gallon lagoon at the North Operations Center (NOC) and a 5.5-million-gallon lagoon at the South Operations Center (SOC). These lagoons provide temporary storage for peak flows that exceed the capacity of the existing conveyance system to the SWRC. Typically, the wastewater stored in these lagoons is pumped to the SWRC following a peak flow event. However, City staff have indicated that during extreme wet weather or emergency events, the lagoons could discharge to the DuPage River. The lagoon at the NOC has a flow meter to measure flow into the lagoon. There are currently no flow meters at the SOC lagoon, but lagoon discharges are estimated based on weir length, water level, and event duration. A summary of measured flow into the NOC storage lagoon as well as discharges from the NOC and SOC lagoons to the DuPage River for the wet weather periods analyzed above is presented in Table 5.

Wet Weather Event Period	Total Flow into NOC Lagoon (MGD)	Flow Discharged from NOC Lagoon (MGD)	Flow Discharged from SOC Lagoon (MGD)
April 30, 2019 to May 4, 2019	2.975 (May 1, 2019)		0.27 (May 1, 2019)
October 13, 2017 to October 17, 2017	3.908 (October 14, 2017) 4.728 (October 15, 2017)	2.60 (October 15, 2017)	0.20 (October 14, 2017)
April 29, 2017 to May 3, 2017	0.447 (April 30, 2017) 1.440 (May 1, 2017)		
February 19, 2018 to February 23, 2018	4.802 (February 20, 2018)		5.25 (February 20, 2018)

Table 5 Storage Lagoon Flow and Discharge Summary

City staff have indicated that the existing pumping and conveyance system limit the wet weather flows that can be conveyed to the SWRC, resulting in diversions to the excess flow lagoons. Strand also understands that the City intends on maintaining the use of the excess flow storage lagoons over the anticipated 20-year planning period. If the conveyance system was modified to increase capacity, the peak influent flows to the SWRC could increase significantly. The data presented in Table 5 suggests that the maximum day flow to the SWRC could increase by 5 MGD (if discharges from lagoons are eliminated) to 15 MGD (if lagoons are eliminated) or more if flows that are currently stored in the lagoons were instead conveyed to SWRC.

D. Per Capita Flows

To determine per capita flows for the SWRC service area, industrial and commercial flows were subtracted from the average influent flow, using a total industrial and commercial flow of approximately 1.29 MGD from major industrial and commercial users (based on water usage) as indicated in the City's 2019 Industrial User Inventory Report. According to the 2018 Population Estimates published by the United States Census Bureau, the populations of the City and the City of Warrenville are approximately 148,304 and 13,260, respectively. The City indicates a current service area population of approximately 149,294 for it and 13,316 for the City of Warrenville, for a total population of 162,610. The Memorandum of Understanding (MOU) between the City and the City of Warrenville indicates that approximately 1,410 people within the City of Warrenville are not currently connected to the sewer system. Therefore, an approximate total population of 161,200 served by the SWRC was used to determine average per capita flows as presented in Table 6.

	2015	2016	2017	2018	2019*	2015 to 2019
Average Influent Flow (MGD)	19.60	19.85	19.82	19.23	22.73	**20.07**
Average Industrial Flow (MGD)	1.29	1.29	1.29	1.29	1.29	**1.29**
Average Residential Flow (MGD)	18.31	18.56	18.53	17.94	21.44	**18.78**
Average Per Capita Flow (gcd)	114	115	115	111	133	**117**

*Note: 2019 data through August
gcd = gallons per capita per day

Table 6 Influent Per Capita Flow Summary

EXISTING INFLUENT LOADING EVALUATION

Influent sampling data from January 2015 through August 2019 was used in the evaluation of existing influent loadings to the SWRC. The reported influent measurements include recycle streams (pre-thickening overflow, thickening filtrate, dewatering centrate, and filter backwash) and, therefore, the influent loadings may be overstated. While it is appropriate to include recycle streams when determining design criteria for treatment processes, this will result in a conservative determination of per capita loadings used in the development of future loadings to the facility. The necessity to further evaluate and separate recycle streams is discussed in relation to the determination of per capita loadings later in this report. A summary of the evaluation of influent loadings for typical design parameters is presented in the following sections.

A. Five-Day Biochemical Oxygen Demand (BOD_5)

Influent samples are analyzed for BOD_5 three days per week. Measured influent BOD_5 concentrations and loadings from January 2015 through August 2019 are presented in Figures 10 and 11, respectively. Over this period, the average influent BOD_5 concentration and loading was 151 milligrams per liter (mg/L) and 24,500 lbs/day, indicating a relatively weak wastewater. 7-day and 30-day rolling averages were created to approximately maximum week and maximum month conditions. The 7-day and 30-day rolling averages are presented in Figures 12 and 13, respectively. The maximum month condition over this period occurred from May 1, 2015 through May 30, 2015, with an average influent loading of 30,600 pounds per day (lbs/day). The maximum week condition over this period occurred from May 6, 2015 to May 13, 2015, with an average influent loading of 39,400 lbs/day. The day with the highest influent BOD_5 loading over this period was February 23, 2016, with an influent concentration of 380 mg/L and influent flow of 19.17 MGD for a loading of 60,800 lbs/day.

	Influent BOD_5 Loading (lbs/day)					
	2015	**2016**	**2017**	**2018**	**2019***	**2015 to 2019**
Average Day	24,900	24,700	24,500	24,100	24,200	**24,500**
Maximum Month (30-day maximum)	30,600	29,000	28,000	27,400	26,800	**30,600**
Maximum Week (7-day maximum)	39,400	37,000	35,000	28,900	33,000	**39,400**
Maximum Day	45,400	60,800	54,900	33,500	37,800	**60,800**

*Note: 2019 data through August

Table 7 Influent BOD_5 Loading Summary

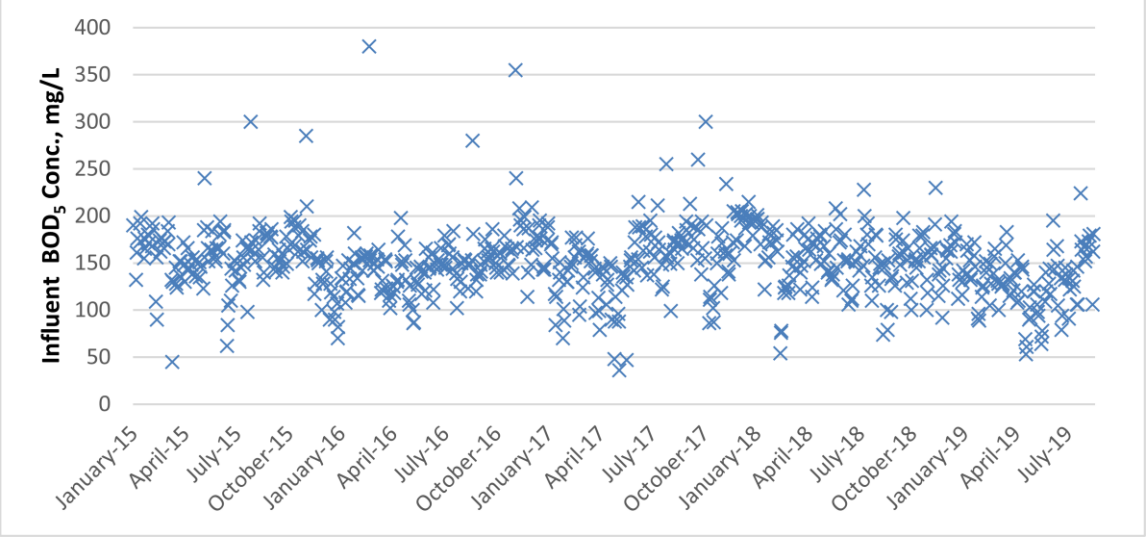

Figure 10 Influent BOD_5 Concentration: January 2015 to August 2019

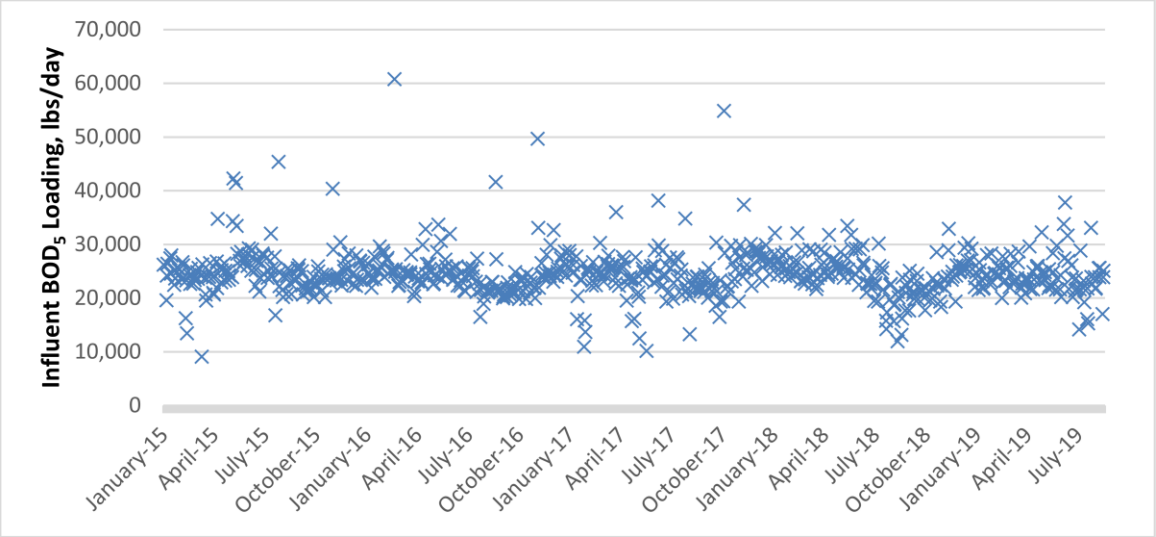

Figure 11 Influent BOD_5 Loading: January 2015 to August 2019

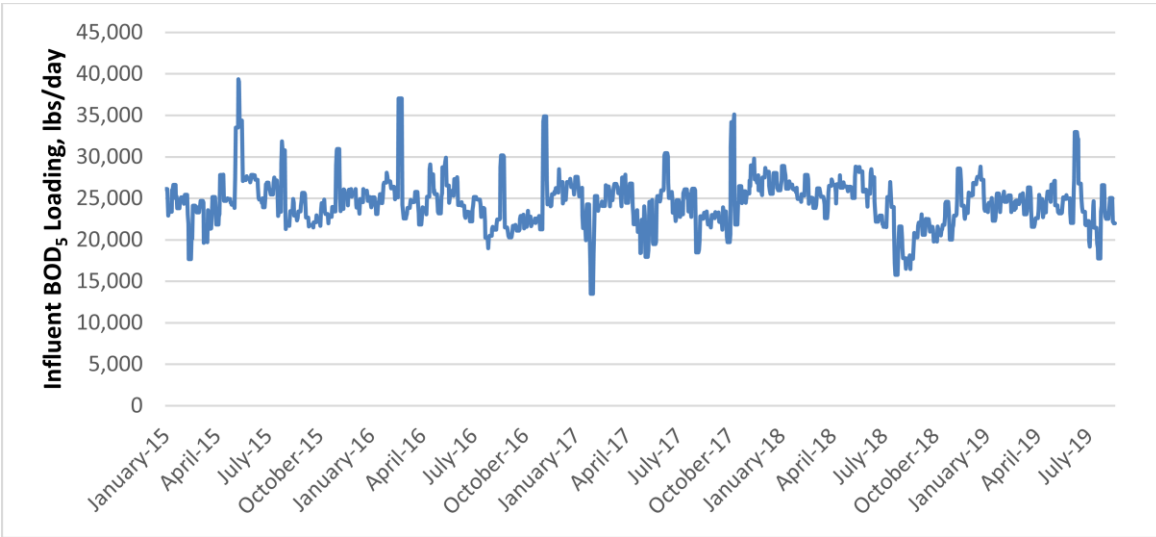

Figure 12 Influent BOD_5 7-Day Rolling Average Loading: January 2015 to August 2019

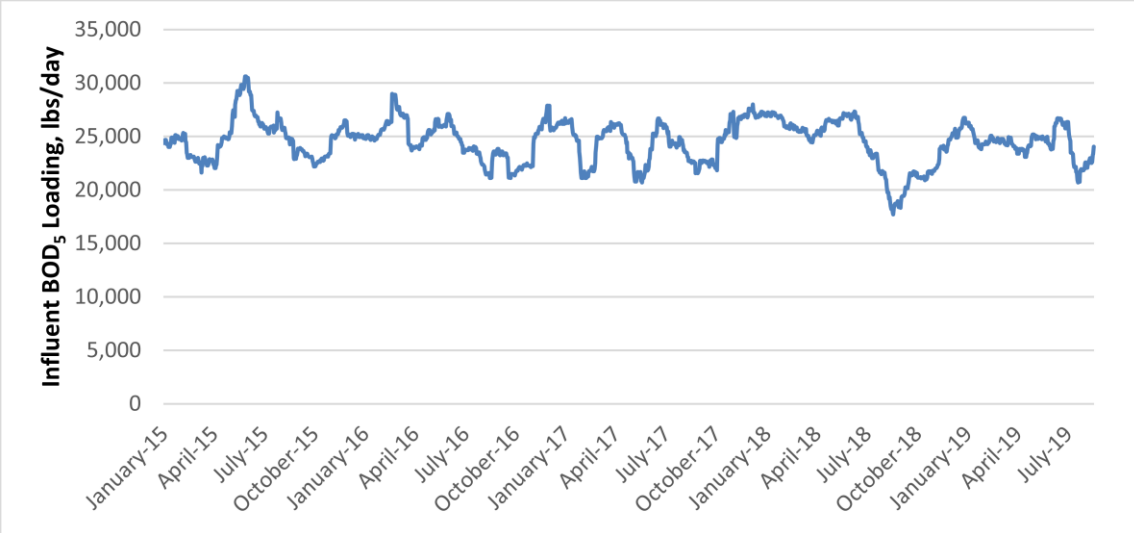

Figure 13 Influent BOD_5 30-Day Rolling Average Loading: January 2015 to August 2019

Peaking factors for the maximum month, maximum week, and maximum day influent BOD_5 loading were calculated based on the data presented in Table 7. A summary of these peaking factors is presented in Table 8.

	2015	2016	2017	2018	2019*
Maximum Month (30-day maximum)	1.2	1.2	1.1	1.1	1.1
Maximum Week (7-day maximum)	1.6	1.5	1.4	1.2	1.4
Maximum Day	1.8	2.5	2.2	1.4	1.6

*Note: 2019 data through August

Table 8 Influent BOD_5 Peaking Factor Summary

While not summarized in this report, the City also analyzed influent samples for carbonaceous five-day biochemical oxygen demand ($cBOD_5$) three days per week. The average $cBOD_5$:BOD_5 ratio from January 2015 to August 2019 was 0.78.

B. Total Suspended Solids (TSS)

Influent samples are analyzed for TSS seven days per week. Measured influent TSS concentrations and loadings from January 2015 through August 2019 are presented in Figures 14 and 15, respectively. Over this period, the average influent TSS concentration and loading was 212 mg/L and 34,500 lbs/day. 7-day and 30-day rolling averages were created to approximately maximum week and maximum month conditions. The 7-day and 30-day rolling averages are presented in Figures 16 and 17, respectively. The maximum month condition over this period occurred from February 7, 2017 through March 8, 2017, with an average influent loading of 43,900 lbs/day. The maximum week condition over this period occurred from February 27, 2017 to March 5, 2017, with an average influent loading of 66,300 lbs/day. The day

with the highest influent TSS loading over this period was January 21, 2017 with an influent concentration of 1,186 mg/L and influent flow of 25.39 MGD for a loading of 251,000 lbs/day. City staff indicate that the influent sampler tubing was partially plugged on this day, which may have resulted in the high influent TSS measurement. Based on this, the January 21, 2017 data was removed from the dataset used in the calculation of existing influent loadings presented in Table 9. City staff also indicate that the second highest loading day during this period, March 3, 2017, may have occurred when an industrial user was bypass its pretreatment system. Because this value was similar to the third highest loading day in which City staff had no known cause for an increased TSS loading, these data points were not removed from the dataset.

	Influent TSS Loading (lbs/day)					
	2015	**2016**	**2017**	**2018**	**2019***	**2015 to 2019**
Average Day	33,800	32,800	35,100	35,000	36,300	**34,500**
Maximum Month (30-day maximum)	41,200	38,800	43,900	41,700	42,100	**43,900**
Maximum Week (7-day maximum)	62,400	57,900	66,300	49,500	49,100	**66,300**
Maximum Day	108,000	152,000	174,000	90,600	94,300	**174,000**

*Note: 2019 data through August

Table 9 Influent TSS Loading Summary

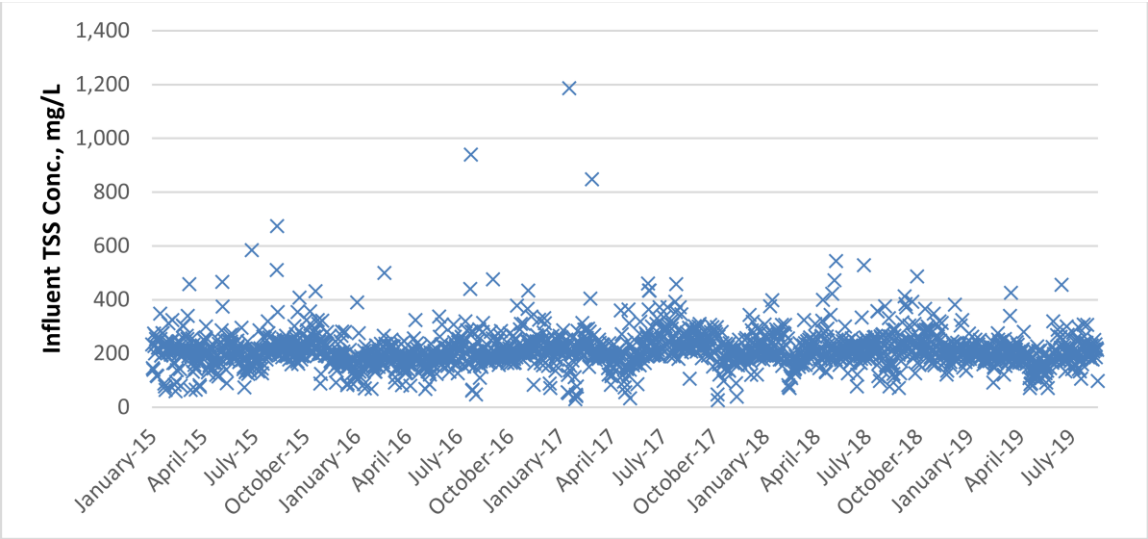

Figure 14 Influent TSS Concentration: January 2015 to August 2019

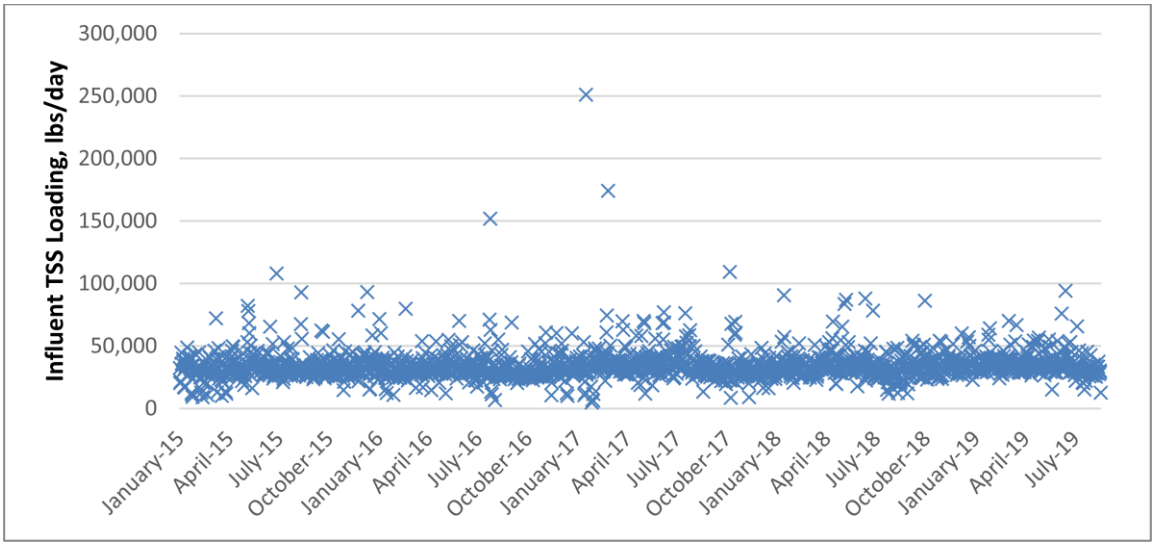

Figure 15 Influent TSS Loading: January 2015 to August 2019

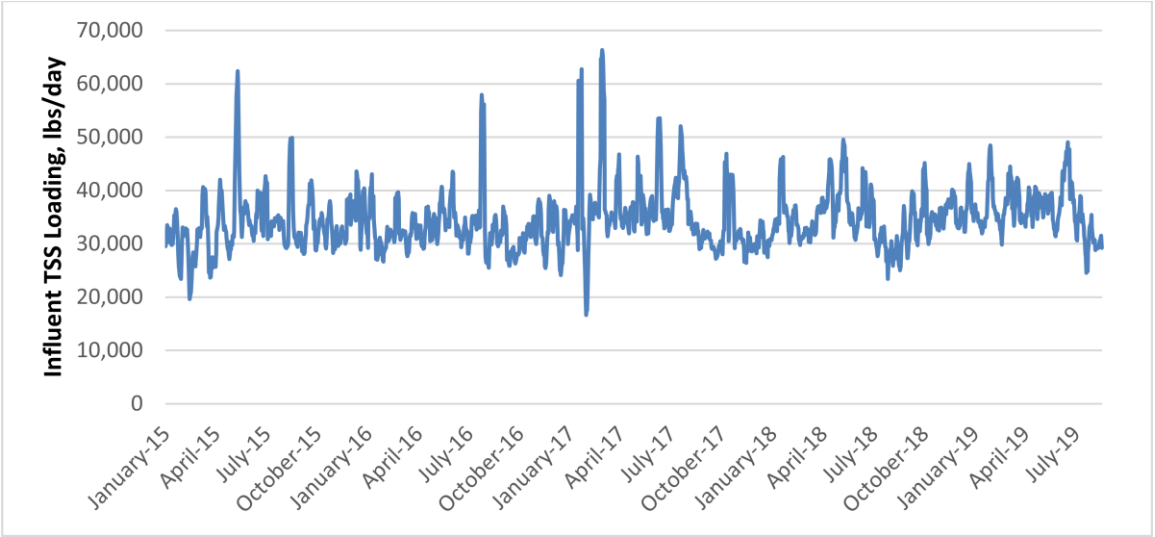

Figure 16 Influent TSS 7-Day Rolling Average Loading: January 2015 to August 2019

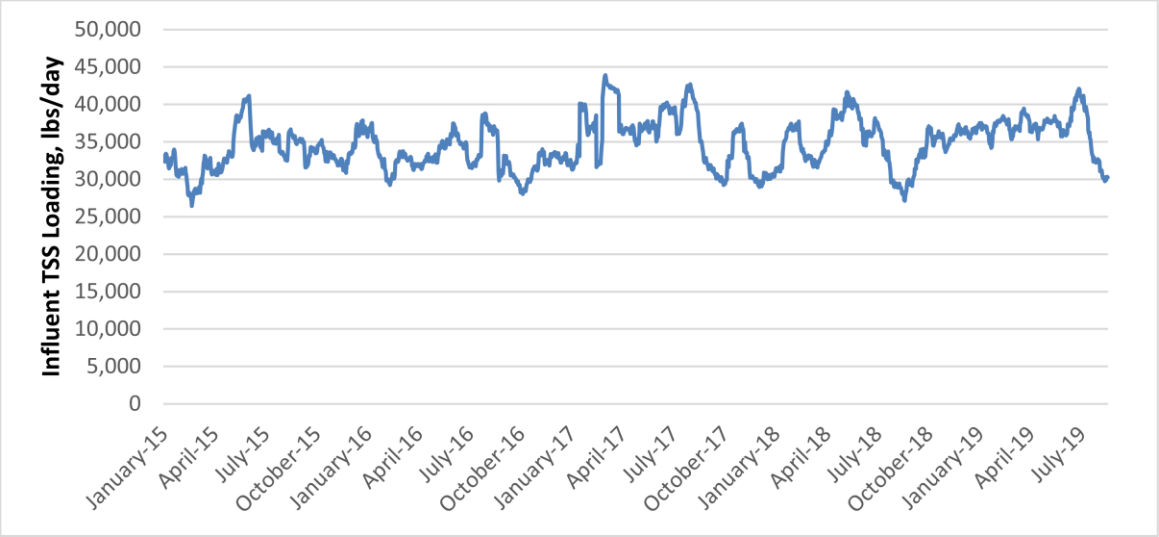

Figure 17 Influent TSS 30-Day Rolling Average Loading: January 2015 to August 2019

Peaking factors for the maximum month, maximum week, and maximum day influent TSS loading were calculated based on the data presented in Table 9. A summary of these peaking factors is presented in Table 10.

	2015	2016	2017	2018	2019*
Maximum Month (30-day maximum)	1.2	1.2	1.2	1.2	1.2
Maximum Week (7-day maximum)	1.8	1.8	1.9	1.4	1.4
Maximum Day	3.2	4.6	4.9	2.6	2.6

*Note: 2019 data through August

Table 10 Influent TSS Peaking Factor Summary

C. Ammonia-Nitrogen (NH_3-N) and Total Kjeldahl Nitrogen (TKN)

Influent samples are analyzed for NH_3-N six days per week. Measured influent NH_3-N concentrations and loadings from January 2015 through August 2019 are presented in Figures 18 and 19, respectively. Over this period, the average influent NH_3-N concentration and loading was 16.7 mg/L and 2,670 lbs/day. 7-day and 30-day rolling averages were created to approximately maximum week and maximum month conditions. The 7-day and 30-day rolling averages are presented in Figures 20 and 21, respectively. The maximum month condition over this period occurred from January 6, 2017 through February 2, 2017, with an average influent loading of 3,276 lbs/day. The maximum week condition over this period occurred from January 16, 2017 through January 22, 2017, with an average influent loading of 3,981 lbs/day. The day with the highest influent NH_3-N loading over this period was January 20, 2017 with an influent concentration of 30.9 mg/L and influent flow of 28.66 MGD for a loading of 7,386 lbs/day. As described earlier, City staff reported partial plugging of the influent sampler tubing on January 21, 2017 that may

have influenced this NH3-N measurement from the day before. Because this value appears to be an outlier, and this high loading day occurred in both the 7-day and 30-day maximum rolling average periods, these values were also calculated with the January 20, 2017 data removed from the dataset. These values are also presented in Table 11 and anticipated to be more representative of the actual existing loading conditions.

	Influent NH_3-N Loading (lbs/day)					
	2015	**2016**	**2017**	**2018**	**2019***	**2015 to 2019**
All Data						
Average Day	2,700	2,690	2,750	2,610	2,580	**2,670**
Maximum Month (30-day maximum)	2,980	2,950	3,280	2,860	2,740	**3,280**
Maximum Week (7-day maximum)	3,070	3,440	3,980	3,050	2,960	**3,980**
Maximum Day	3,670	5,420	7,390	3,380	3,090	**7,390**
January 20, 2017 Data Removed						
Average Day	2,700	2,690	2,740	2,610	2,580	**2,670**
Maximum Month (30-day maximum)	2,980	2,950	3,100	2,860	2,740	**3,100**
Maximum Week (7-day maximum)	3,070	3,440	3,560	3,050	2,960	**3,560**
Maximum Day	3,670	5,420	4,880	3,380	3,090	**5,420**

Note: 2019 data through August

Table 11 Influent NH_3-N Loading Summary

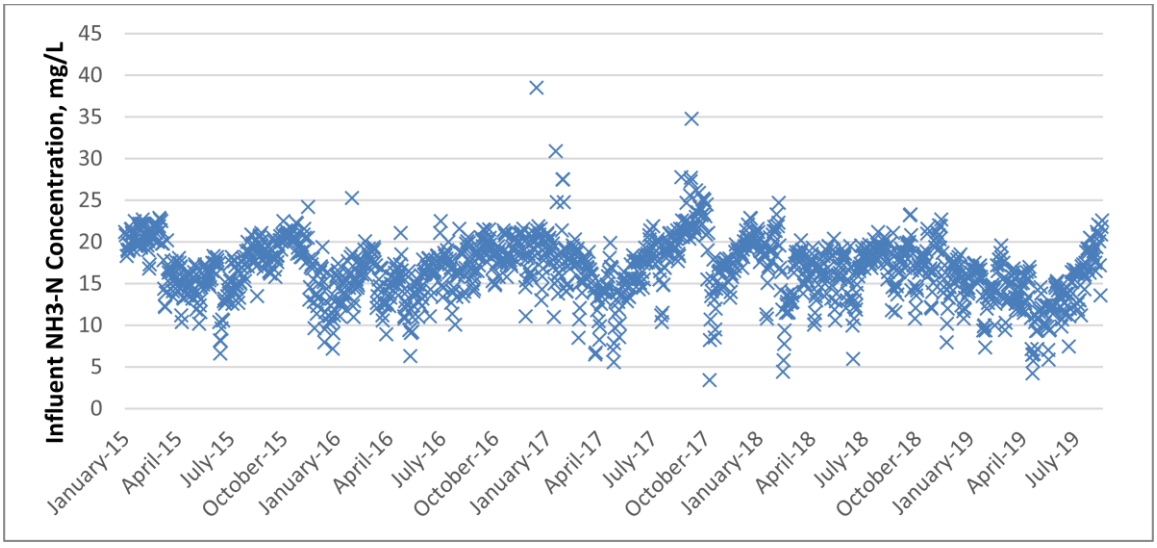

Figure 18 Influent NH_3-N Concentration: January 2015 to August 2019

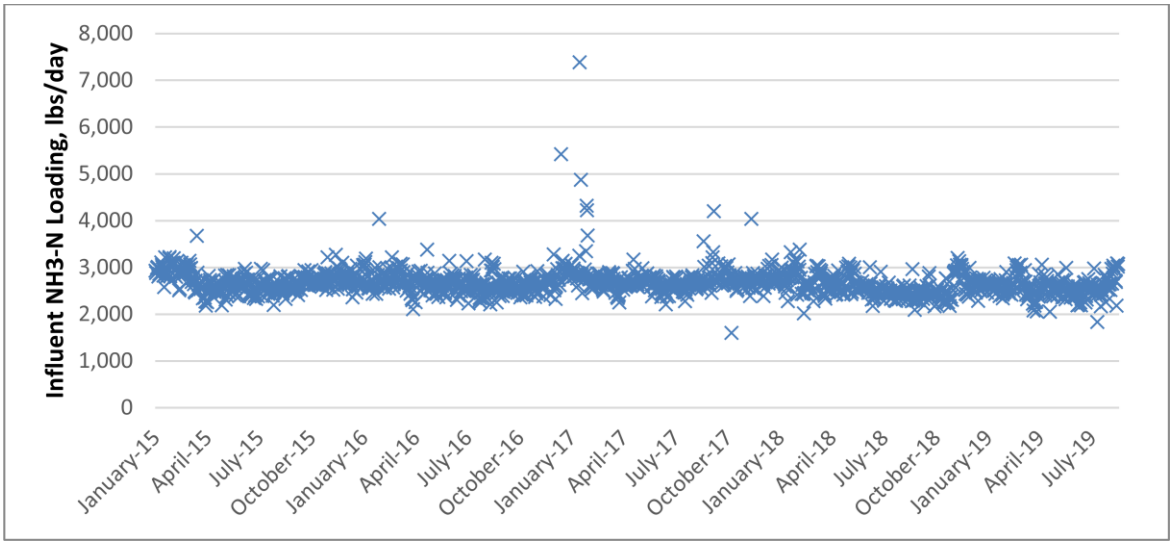

Figure 19 Influent NH_3-N Loading: January 2015 through August 2019

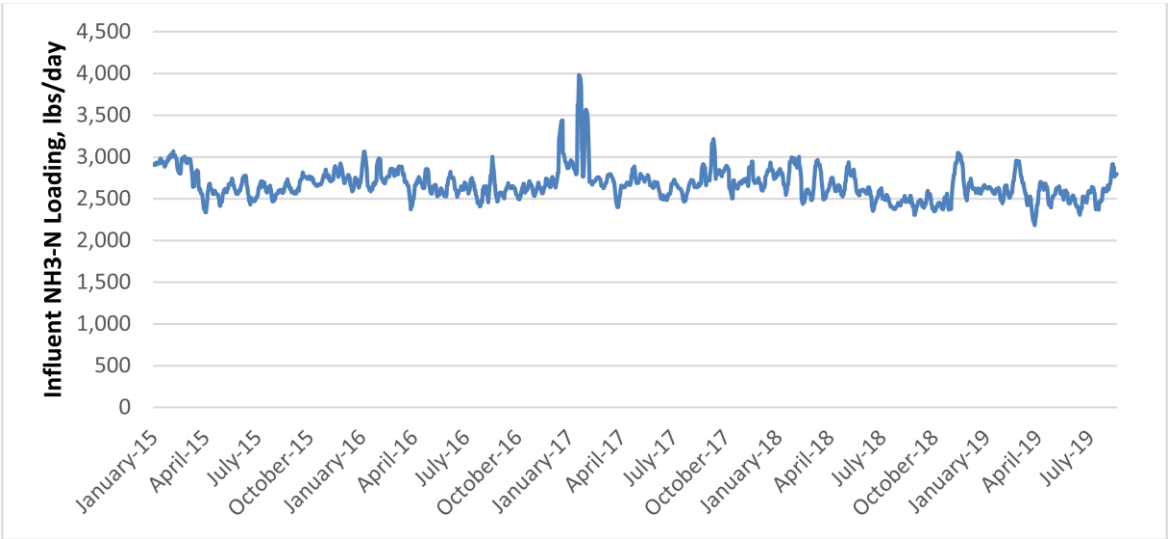

Figure 20 Influent NH_3-N 7-Day Rolling Average Loading: January 2015 to August 2019

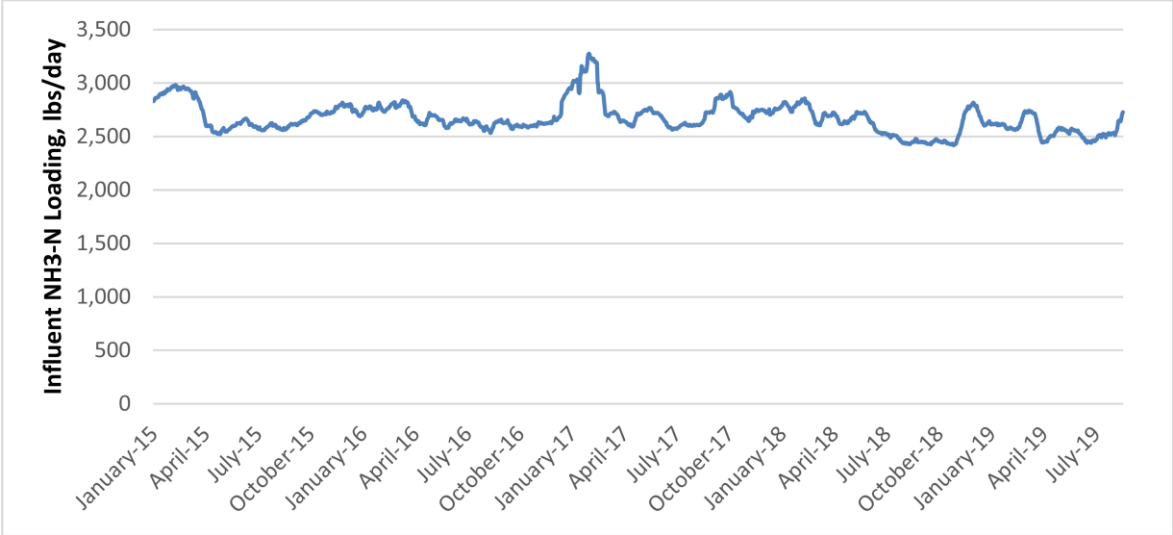

Figure 21 Influent NH_3-N 30-day Rolling Average Loading: January 2015 to August 2019

Peaking factors for the maximum month, maximum week, and maximum day influent NH_3-N loading were calculated based on the data presented in Table 11. A summary of these peaking factors is presented in Table 12.

	2015	2016	2017	2018	2019*
All Data					
Maximum Month (30-day maximum)	1.1	1.1	1.2	1.1	1.1
Maximum Week (7-day maximum)	1.1	1.3	1.4	1.2	1.1
Maximum Day	1.4	2.0	2.7	1.3	1.2
January 20, 2017 Data Removed					
Maximum Month (30-day maximum)	1.1	1.1	1.1	1.1	1.1
Maximum Week (7-day maximum)	1.1	1.3	1.3	1.2	1.1
Maximum Day	1.4	2.0	1.8	1.3	1.2

*Note: 2019 data through August

Table 12 Influent NH_3-N Peaking Factor Summary

The City began regularly analyzing the influent for TKN in January 2017, with measurements taken once per month. Measured influent TKN concentrations and loadings from January 2017 through August 2019 are presented in Figures 22 and 23, respectively. Over this period, the average influent TKN concentration was 28.5 mg/L. The maximum measured TKN loading occurred on May 13, 2019, with an influent concentration of 25 mg/L and influent flow of 26.05 MGD for a loading of 5,430 lbs/day.

	Influent TKN Loading (lbs/day)					
	2015	2016	2017	2018	2019*	2015 to 2019
Average Day	N/A	N/A	4,480	4,570	4,620	**4,550**
Maximum Day	N/A	N/A	5,110	5,150	5,430	**5,430**

*Note: 2019 data through August

Table 13 Influent TKN Loading Summary

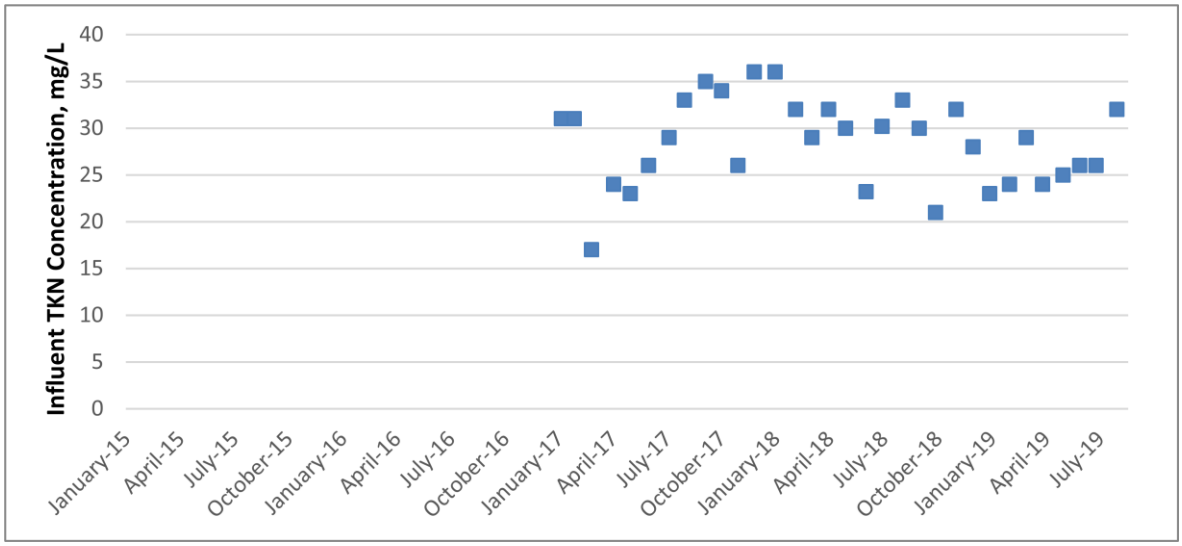

Figure 22 Influent TKN Concentration: January 2015 to August 2019

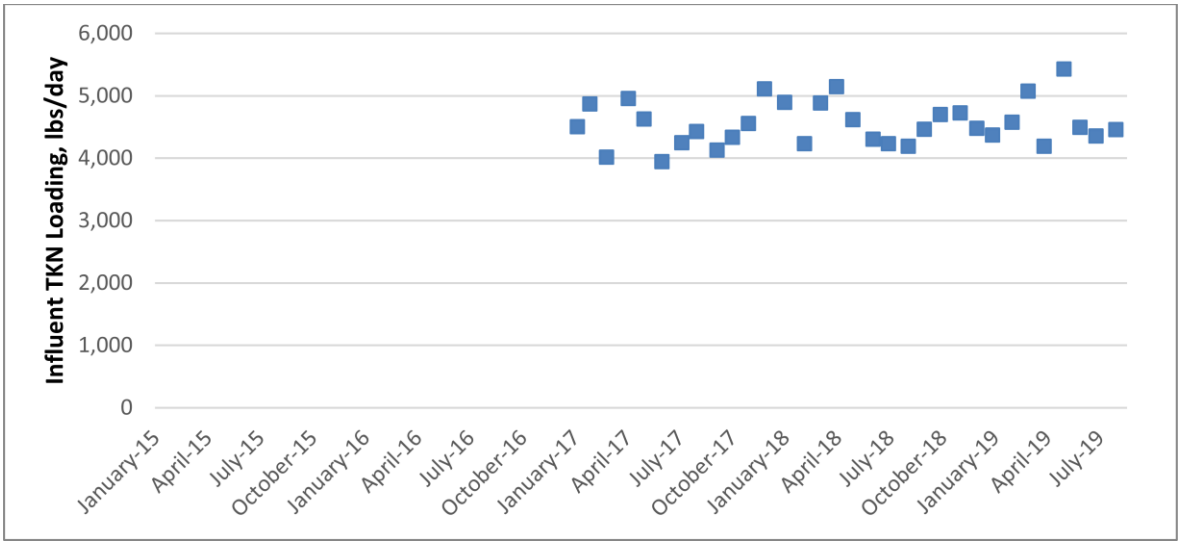

Figure 23 Influent TKN Loading: January 2015 to August 2019

Because the dataset for influent NH_3-N is significantly larger than the influent TKN dataset, an evaluation of the historical ratio of influent TKN to NH_3-N was conducted to approximate influent TKN for days that influent TKN was not measured. Influent NH_3-N data from the days that influent TKN was measured was used to determine an influent TKN to NH_3-N ratio, as presented in Figure 23. From January 2017 to August 2019, the influent TKN:NH_3-N ratio was in the range of 1.10 to 2.10 with an average value of 1.68. Based on the average TKN:NH_3-N ratio of 1.68, the influent NH_3-N loading summary presented in Table 11 was converted to influent TKN and is presented in Table 14.

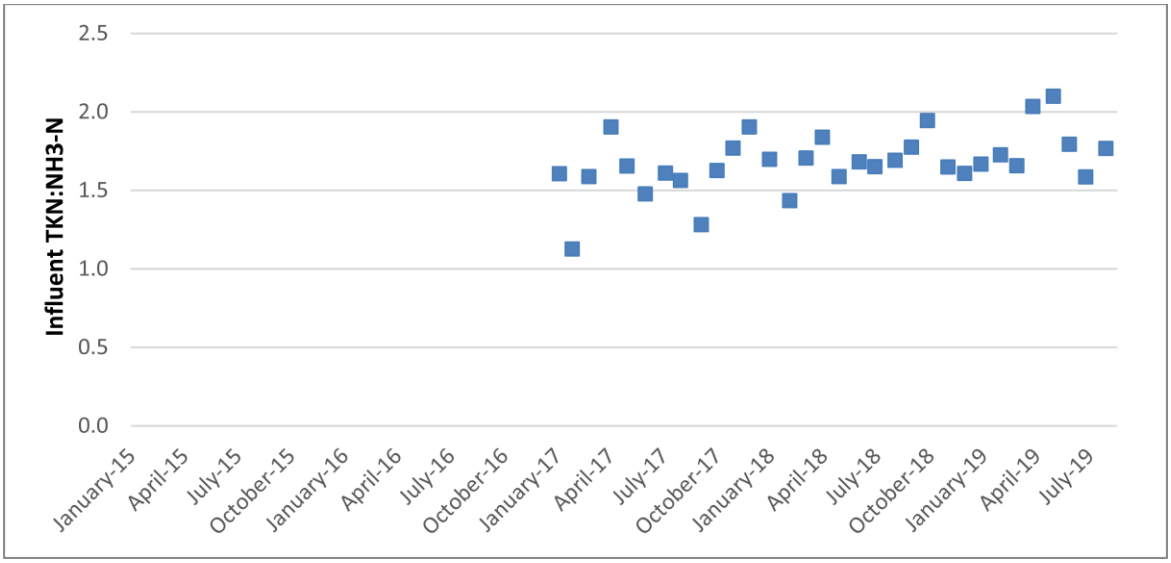

Figure 24 Influent TKN:NH_3-N Ratio: January 2015 to August 2019

	Influent TKN Loading (lbs/day)					
	2015	**2016**	**2017**	**2018**	**2019**	**2015 to 2019**
All Data						
Average Day	4,540	4,510	4,630	4,380	4,330	**4,490**
Maximum Month (30-day maximum)	5,010	4,960	5,500	4,800	4,610	**5,500**
Maximum Week (7-day maximum)	5,150	5,770	6,690	5,120	4,960	**6,690**
Maximum Day	6,170	9,110	12,400	5,680	5,190	**12,400**
January 20, 2017 Data Removed						
Average Day	4,540	4,510	4,600	4,380	4,330	**4,480**
Maximum Month (30-day maximum)	5,010	4,960	5,220	4,800	4,610	**5,220**
Maximum Week (7-day maximum)	5,150	5,770	5,990	5,120	4,960	**5,990**
Maximum Day	6,170	9,110	8,190	5,680	5,190	**9,110**

*Note: 2019 data through August

Table 14 Influent TKN Loading Summary Using Average TKN:NH_3-N Ratio of 1.68

The City began regularly analyzing the influent for total nitrogen (TN) in November 2016, with measurements taken once per month. The influent TN is generally very close to the influent TKN tabulated above, with an average influent TKN:TN ratio of 0.95.

D. Total Phosphorus (TP)

The City began regularly analyzing the influent for TP in November 2016, with measurements taken once per month. Measured influent TP concentrations and loadings from November 2016 through August 2019 are presented in Figures 25 and 26, respectively. Over this period, the average influent TP concentration was 5.2 mg/L. The maximum measured TP loading occurred on February 1, 2017, with an influent concentration of 9.7 mg/L and influent flow of 18.84 MGD for a loading of 1,520 lbs/day. City staff noted an unusually low influent TSS measurement on the day that the higher influent TP was measured, February 1, 2017. This may suggest plugging of the influent sampler tubing influenced the TP measurement on this day. Maximum week, maximum month, and maximum day peaking factors were not determined for the TP data because of the long sampling interval.

	Influent TP Loading (lbs/day)					
	2015	**2016**	**2017**	**2018**	**2019**	**2015 to 2019**
Average Day	N/A	610	780	910	860	**830**
Maximum	N/A	630	1,520	1,190	1,090	**1,520**

*Note: 2019 data through August

Table 15 Influent TP Loading Summary

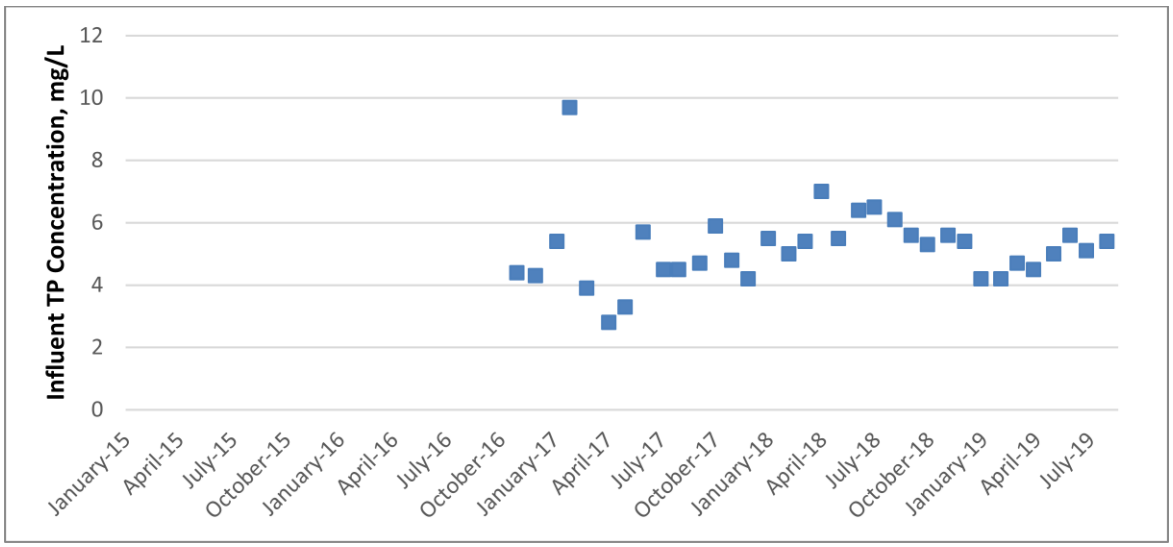

Figure 25 Influent TP Concentration: January 2015 to August 2019

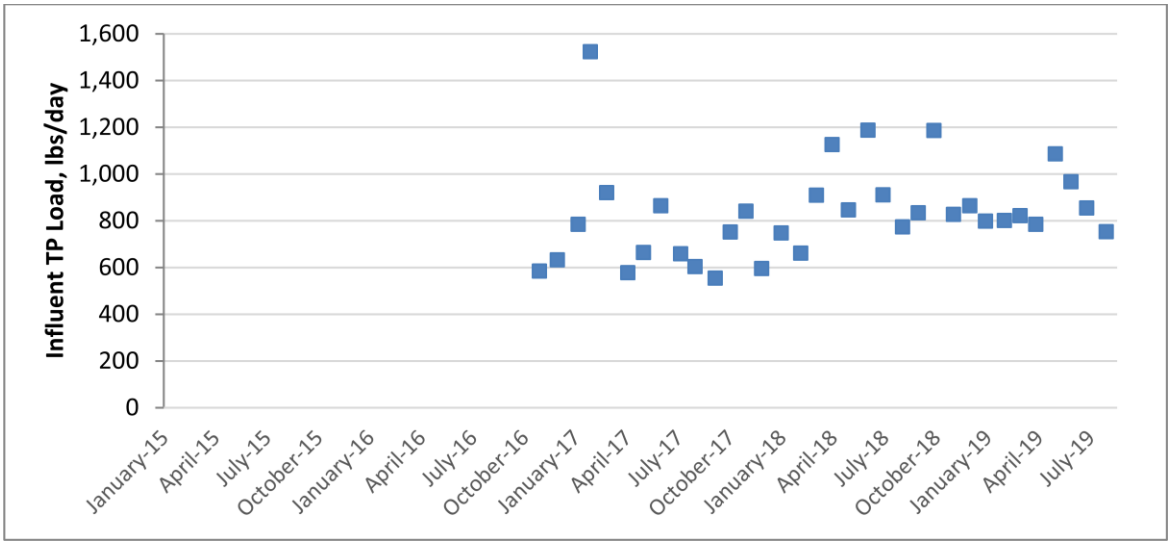

Figure 26 Influent TP Load: January 2015 to August 2019

E. Influent Loading Summary

Table 16 presents a summary of the existing influent loadings for the period from January 2015 to August 2019, with and without the data outliers (January 21, 2017 TSS loading and January 20, 2017 NH_3-N loading) as determined in earlier sections. Based on the long sampling interval (one sample per month), influent TP values for maximum month, maximum week and maximum day conditions are not included in the summary table.

	Influent Loads (lbs/day)				
	BOD_5	TSS	NH_3-N	TKN	TP
Average Day	24,500	34,600	2,670	4,480	830
Maximum Month	30,600	43,900	3,100	5,220	-
Maximum Week	39,400	66,300	3,560	5,990	-
Maximum Day (with outliers)	60,800	251,000	7,390	12,400	-
Maximum Day (without outliers)	60,800	174,000	4,880	9,110	-

Table 16 Existing Influent Loading Summary

F. Industrial Loadings

While the City does not have any major industries that are known to discharge a significant loading to the SWRC, a high-level evaluation was conducted of the wasteload contribution of the four industries that are routinely sampled by the City. Using the average discharge flow reported in the City's 2019 Industrial User Inventory Report and the monthly industrial sampling data from January 2015 to August 2019, average wasteload contributions of these four industrial users were determined as presented in Table 17. As shown, the BOD_5, TSS, and NH_3-N contributions of these four industries account for less than 1 percent of the average influent loading to the SWRC when combined. These contributions are

insignificant and, therefore, the reported influent loadings to the SWRC were not adjusted when determining per capita loads. Likewise, the measured influent phosphorus loading was not adjusted since phosphorus is not currently measured in the discharge from these industries.

Industry	Average Load Discharged to SWRC (lbs/day)		
	BOD_5	**TSS**	**NH_3-N**
Mondelez Global	6.4	14.0	0.2
Nalco Company	55.9	81.3	10.4
British Petroleum Campus	27.0	103.3	4.3
Laser Technology, Inc.	4.4	5.3	0.9
Total	**94**	**204**	**16**
% of Average Influent Load to SWRC	**0.4%**	**0.6%**	**0.6%**

Table 17 Industrial Loading Summary

G. Per Capita Loadings

Average per capita influent loadings were determined for the SWRC using a total service area population of 161,564, as presented earlier. The per capita loadings to the SWRC, along with typical values for domestic wastewater as indicated in the Illinois Administrative Code (IAC) Title 35, Ten States Standards, and *Wastewater Engineering: Treatment and Reuse* (Metcalf and Eddy, 2013), are presented in Table 18. Based on the average influent loadings from January 2015 to August 2019, the per capita loadings are similar to typical values for domestic wastewater in areas where garbage grinders are not used extensively.

Parameter	Per Capita Loadings (pcd)				
	SWRC: January 2015 to August 2019 Average	**IAC Title 35 (without garbage grinders)**	**IAC Title 35 (with garbage grinders)**	**Ten States Standards (without garbage grinders)**	***Wastewater Engineering: Treatment and Reuse* (without garbage grinders)**
BOD_5	0.15	0.17	0.22	0.17	0.18
TSS	0.21	0.20	0.25	0.20	0.20
TKN	0.028			0.036	0.029
TP	0.0052				0.0070

Notes:
**Wastewater Engineering: Treatment and Reuse,* Metcalf and Eddy, 2013
pcd = pounds per capita per day

Table 18 Per Capita Loading Summary

G. Recycle Loadings

As discussed earlier, the influent samples include recycle flows and therefore the influent loadings are likely overstated. A high-level evaluation of influent loadings from recycle streams was conducted using

available sampling and flow data. Additional samples and flow measurements could be taken to refine this analysis, if desired.

A summary of recycle flow rates is presented in Table 19. While the SWRC measures recycle flows from the GBT and filter backwash, the pre-thickener overflow and centrate flowrates were estimated based on sludge flow measurements. While thickening and dewatering operations do not occur every day, the analysis in this section is based on an annual average recycle flow for comparison to average influent loadings. Therefore, the contribution of recycle streams on influent loadings could be higher or lower than the average presented in this section, depending on whether thickening and dewatering are occurring.

Recycle Stream	Flow (MGD)
Pre-thickener Overflow	0.26
GBT Filtrate	0.14*
Centrate	0.09*
Filter Backwash	0.86

*Value presented is annual average, including days not in operation

Table 19 Recycle Stream Flow Estimates

The City does not measure BOD_5 on these recycle streams. While soluble BOD_5 is anticipated to be low in the recycle streams, the volatile solids in the recycle streams would contribute to the influent BOD_5.

The City regularly measures centrate and GBT filtrate TS concentrations, which average approximately 1,600 mg/L and 1,700 mg/L, respectively. This suggests that these recycle streams contribute approximately 3,000 lbs/day to the SWRC influent, or less that 10 percent of the measured influent loading. The City does not regularly measure TSS in filter backwash or pre-thickener overflow. Several pre-thickener overflow TSS measurements from 2013 indicate an average concentration of approximately 10 mg/L. Based on typical SWRC secondary effluent and final effluent TSS concentrations of 12 mg/L and 2 mg/L, respectively, it is anticipated that filter backwash contributes approximately 10 mg/L to the composite influent measurement. This constitutes approximately 5 percent of the measured influent loading to the facility. Therefore, the total contribution of recycle flows to the measured influent TSS loading is anticipated to be greater than 15 percent.

Based on information provided in the 2018 Phosphorus Discharge Optimization Plan, the recycle streams from the thickening and dewatering operations are anticipated to be low in nitrate and ammonia, with concentrations less than 1 mg/L. Pre-thickener overflow and filter backwash are anticipated to have similar ammonia and nitrate concentrations as the secondary effluent, with averages of less than 0.3 mg/L and 12 mg/L, respectively. Therefore, the recycle streams are not anticipated to be a significant contributor of NH_3-N or TKN to the influent measurement.

The 2018 Phosphorus Discharge Optimization Plan indicates that the recycle streams from the thickening and dewatering operations have total phosphorus concentrations in the range of 40 to 90 mg/L, with an average of 63 mg/L. Based on the estimated recycle flow rates presented in Table 19, it is anticipated these sources contribute approximately 120 lbs/day to the influent, or 14 percent of the measured influent loading. Overflow from the WAS pre-thickener and filter backwash are anticipated to have similar soluble phosphorus concentration as the secondary effluent, with an average of less than 2.5 mg/L, and

particulate phosphorus concentration of approximately 0.2 mg/L. (based on an estimated TSS concentration of 10 mg/L and 2 percent particulate TP content). This would result in a phosphorus contribution of the pre-thickener overflow and filter backwash of approximately 25 lbs/day, or 3 percent of the measured influent loading. Therefore, the total contribution of recycle flows to the measured influent TP loading is anticipated to be approximately 17 percent.

As presented in this section, recycle loadings for some parameters are anticipated to be significant components of the measured influent loadings. Because it is necessary to include the impact of recycle streams when designing treatment processes, the loading values included in this report were maintained as measured (as the total of raw wastewater and recycle flow components). Additional sampling and flow measurements could be conducted in the future to better characterize these components, particularly for future process modeling for use in biological nutrient removal (BNR) planning and design.

EXISTING FLOW AND LOADING SUMMARY

Based on the evaluation of existing flow and loading data, a summary of the baseline flow and loading conditions, per capita values, and peaking factors to be used in the determination of future flows and loadings to the SWRC are presented in Tables 20 through 22. Peaking factors used for future growth are based on the maximum year peaking factor identified for each parameter. The peak flows presented in Table 20 are based on historical flows measured at the SWRC and, therefore, assume that the collection system storage lagoons remain in service.

Parameter	Value	Source
Flow (MGD)		
Average Day	20.07	January 2015 to August 2019 Average
Maximum Month	32.22	Maximum 30-day Rolling Average: 2019
Maximum Week	43.42	Maximum 7-day Rolling Average: 2019
Maximum Day	61.42	October 13-17, 2017 Wet Weather Event
Peak Hour	65.64	October 13-17, 2017 Wet Weather Event
Peak Instantaneous	67.43	October 13-17, 2017 Wet Weather Event
BOD_5 (lbs/day)		
Average Day	24,500	January 2015 to August 2019 Average
Maximum Month	30,600	Maximum 30-day Rolling Average: 2015
Maximum Week	39,400	Maximum 7-day Rolling Average: 2015
Maximum Day	60,800	Maximum Day: February 23, 2016
TSS (lbs/day)		
Average Day	34,500	January 2015 to August 2019 Average
Maximum Month	43,900	Maximum 30-day Rolling Average: 2017
Maximum Week	66,300	Maximum 7-day Rolling Average: 2017
Maximum Day	174,000	Maximum Day (excluding outliers): March 3, 2017
TKN (lbs/day)		
Average Day	4,480	January 2015 to August 2019 Average (excluding outliers)
Maximum Month	5,220	Maximum 30-day Rolling Average: 2017
Maximum Week	5,990	Maximum 7-day Rolling Average: 2017
Maximum Day	9,110	Maximum Day (excluding outliers): December 18, 2016
TP (lbs/day)		
Average Day	830	January 2015 to August 2019 Average
Maximum Month	1,000	Average TP Loading and Peaking Factor for BOD_5
Maximum Week	1,330	Average TP Loading and Peaking Factor for BOD_5
Maximum Day	2080	Average TP Loading and Peaking Factor for BOD_5

Table 20 Baseline Flows and Loadings

Parameter	Value	Source
Flow	100 gcd	IAC Title 35
BOD_5	0.17 pcd	IAC Title 35
TSS	0.21 pcd	SWRC: January 2015 to August 2019 Average
TKN	0.028 pcd	SWRC: January 2015 to August 2019 Average
TP	0.0052 pcd	SWRC: January 2015 to August 2019 Average

Table 21 Future Growth Per Capita Flow and Loadings

Parameter	Flow	BOD_5	TSS	TKN	TP[a]
Maximum Month	1.4	1.2	1.2	1.1	1.2
Maximum Week	1.9	1.6	1.9	1.3	1.6
Maximum Day	3.1	2.5	4.9	2.0	2.5
Peak Hour	3.3	-	-	-	-
Peak Instantaneous	3.4	-	-	-	-

[a]BOD_5 peaking factors used for TP based on limited TP sample data

Table 22 Future Growth Peaking Factor Summary

The SWRC is currently designed for an average day flow of 26.25 MGD. The City's NPDES permit also indicates that a future expansion has been previously approved that would increase the design average flow to 30.00 MGD. This expansion would include the addition of an aeration basin, final clarifier, and aerobic digester, among other things. A summary of the existing flows and loadings to the SWRC compared to the current design flow and loadings is presented in Table 23. As shown, the facility is currently operating at approximately 76 percent of its design average flow capacity but is nearing its BOD_5 and TSS loading capacities. Recent peak flow events have also exceeded the permitted design maximum flow of the facility by over 10 percent.

Parameter	Current Design	Future Expansion in Permit	Existing Condition	% of Current Design Capacity
Flows (MGD)				
Average Day	26.25	30.00	20.07	76%
Maximum Day	55.13	63.00	61.42	111%
Loading (lbs/day)				
Average BOD_5	27,400	31,300	24,500	89%
Average TSS	39,400	45,000	34,500	88%
Average TKN	-	-	4,480	-
Average TP	-	-	830	-

Table 23 Existing Facility Design Capacity Summary

FUTURE FLOW AND LOADING PROJECTIONS

Future flow and loadings to the SWRC were projected based on planned development and population growth within the existing SWRC service area. As described earlier, there are areas in the Naperville FPA that are not currently served by the SWRC, many of which are currently developed but unincorporated areas. An evaluation of potential future flows and loadings if the entire Naperville FPA were to be served by the SWRC is also presented.

A. Planned Developments and Vacant Parcels in Existing Service Area

In this section, the projected wastewater contributions from planned developments and vacant parcels within the City are summarized, as well as a discussion regarding the intergovernmental agreement between the City and the City of Warrenville regarding future wastewater service.

1. The City of Naperville

Table 24 presents a summary of the total planned developments that will be served by the SWRC based on information provided by the City. This summary includes a breakdown by land use and a projection of population equivalents (PE) based on IAC Title 35 Part 370: Illinois Recommended Standards for Sewage Works and *Estimating Commercial, Industrial, and Institutional Water Use on the Basis of Heated Building Area* (Miguel Morales, American Water Works Association Journal, June 2011), as noted. The totals presented in this table represent several developments throughout the City, including those that are currently approved and under construction, such as Wagner Farms, as well as those that are currently in the conceptual phase. These totals also include approximately 475 vacant single-family homes or townhome parcels in developments that are currently under construction, mostly in the Ashwood Park area, as identified using geographic information system (GIS) and aerial imagery.

Development Type	Size	Unit	PE per Unit	Total PE
Single-Family Homes or Townhomes	1,387	Homes	3.5[a]	4,855
Multifamily	1,471	Units	3.0[a]	4,413
Medical Office	22,000	sf	0.001562[b]	34
Hotel	110	Beds	1.5[a]	165
Hospital	24	Beds	2.5[a]	60
Restaurant	49,000	sf	0.007417[b]	363
Retail/Other Commercial	343,000	sf	0.000981[b]	336
Mixed-Use Development	17.9	Acres	74[c]	1,326
Total Planned Developments				**11,552**

[a] Source: IAC Title 35
[b] Source: Miguel A. Morales, Estimating Commercial, Industrial, and Institutional Water Use on the Basis of Heated Building Area, AWWA Journal, June 2011
[c] Based on nearby multiuse developments in the City that are planned or under construction

Table 24 Planned Development Population Equivalent Summary

In addition to the planned developments, an evaluation of undeveloped parcels within the City was conducted using information included in the City's GIS database. Parcels whose land use is indicated as vacant or pending development in GIS were cross-referenced with 2019 aerial images to identify vacant parcels as presented in Table 25. The parcel sizes and current zoning, as indicated in the GIS database, were used with typical PE per acre values to estimate PE associated with these vacant parcels. For the property at 3540 248th Street, zoned R1, a PE per acre value of 15 was used, which appears to be similar to adjacent residential developments. An approximate PE per acre value of 150 for the parcel zoned R4 at Gowdey Street and Amersale

Drive was determined using information provided by the City of currently planned multifamily developments in other locations. Wastewater contributions for commercial and industrial developments can vary based on the business type. For example, a retail development is anticipated to contribute less wastewater than a similarly sized restaurant. A typical average value of 15 PE per acre was used in this analysis for all industrial and commercial parcels. However, the actual contribution for each parcel may vary based on the development type. Based on this analysis, a PE of 2,677 will be included in the future flow and loading evaluation for the vacant parcels identified within the City, in addition to those presented in Table 24.

Parcel Address/Location	Size (acres)	Zoning	PE/acre	Total PE
3540 248th Avenue	13.9	R1	15[a]	209
Gowdey Street and Amersale Drive	1.6	R4	150[a]	247
Sunrise Road	20.8	I	15	312
La Salle Avenue	2.4	I	15	36
1720 Quincy Avenue	5.0	I	15	75
1300 Shore Road	2.0	I	15	31
Frontenac Court	11.6	I	15	174
West Diehl Road at Fisher Drive	6.3	I	15	95
Raymond Drive and Ferry Street	1.2	I	15	18
111 Ambassador Drive	5.0	I	15	75
2404 North Aurora Road	19.9	I	15	298
1056 104th Street	1.0	B1	15	15
103rd Street and Hwy 59, SE Corner	22.2	B2	15	333
2939 Audrey Lane	6.2	B2	15	93
Beebe Drive	3.3	B2	15	50
2788 Forgue Drive	2.8	B2	15	41
3136 Anna Marie Lane	0.9	B2	15	14
2968 Reflection Drive	1.6	B2	15	24
2804 Hassert Boulevard	1.4	B2	15	20
1936 Springbrook Square Road	1.4	B2	15	21
Hwy 59 and Gowdey Street	1.3	B2	15	20
Ogden Avenue and River Road	4.0	B2	15	60
West Diehl Road at Fisher Drive	9.8	B3	15	147
Ogden Avenue and Raymond Drive	1.4	B3	15	20
East Warrenville Road	10.9	ORI	15	164
103 Shuman Boulevard	1.6	ORI	15	24
Freedom Drive and Diehl Street	2.6	ORI	15	39
West Diehl Road at Fisher Drive	1.5	ORI	15	22
Total Population Equivalents				**2,677**

[a] Based on similarly zoned developments within the City.

Table 25 Vacant Incorporated Parcel Summary

2. The City of Warrenville

The City provides sanitary sewer service to the City of Warrenville according to intergovernmental agreements that dictate the average daily flow received from the City of Warrenville (quantified as PE at 100 gcd as well as maximum day and maximum hour flows that are pumped into the City's conveyance system. These maximum day and maximum hour flows are limited to 250 percent and 400 percent of the three-month low flow from the previous 12 months, respectively. According to a 2018 MOU between the City and the City of Warrenville, the City of Warrenville has purchased 25,048 PE of average daily flow capacity from the City of Naperville with the right to purchase up to a total of 27,400 PE. This MOU also summarizes a full buildout analysis conducted by the City of Warrenville to determine the anticipated future PE required. In this analysis, the City of Warrenville indicates a projected full buildout residential population of 17,252, along with additional flows and loadings from the Cantera Development. A summary of this analysis is presented in Table 26. The City of Warrenville's analysis concluded that the projected average daily flow PE for the City of Warrenville at total buildout (including the Cantera Development) would be approximately 26,100 and would not exceed the maximum permitted PE of 27,400 as indicated in the intergovernmental agreements with the City. While the City of Warrenville's analysis projected that the maximum permitted PE of 27,400 would not be reached, the projected totals are close to the maximum permitted values and, therefore, the maximum permitted values are used to project the City of Warrenville's potential contribution of future flows and loadings to the SWRC. Using the data presented in the MOU, this results in a potential increase in the City of Warrenville's contribution to flows and loadings to the SWRC by approximately 9,600 PE and a potential increase in maximum day and peak hour flows of 1.77 MGD and 2.85 MGD, respectively. The MOU includes the requirement for the City of Warrenville to construct flow equalization facilities as necessary to maintain the permitted peak flows.

Design Condition	Total Permitted Flow Under MOU (MGD)	Total Buildout Flow (MGD)	Current Flow[a] (MGD)	Available Permitted Flow Capacity (MGD)
Annual Average	2.74	2.61	1.78	0.96
Average Dry Weather Flow (three-month low flow)	2.12	2.02	1.41	0.71
Maximum Day (250% of three-month low flow)	5.30	5.04	3.53	1.77
Peak Hour (400% of three-month low flow)	8.49	8.07	5.64	2.85

[a]Based on metering data from 2015 (Cantera) and 2016 to 2017 (Warrenville) as presented in the 2018 MOU.

Table 26 City of Warrenville Buildout Flow Summary from 2018 MOU

3. Flow and Loading Summary: Planned Developments and Vacant Parcels

Future flows and loadings to the SWRC were developed based on a total additional PE of 14,229 for the City (as presented in Tables 24 and 25) and 9,600 for the City of Warrenville

(as presented in Table 26), for a total addition PE of 23,829. Future flow and loading projections using this additional PE based on existing flows and loadings, per capita values, and peaking factors presented earlier are summarized in Tables 27 and 28. The peak flows presented in Table 27 are based on historical flows measured at the SWRC and, therefore, assume that the collection system storage lagoons remain in service and that the increase in peak flows indicated is not limited by the conveyance system. The peak hourly flow peaking factor based on historical data at SWRC of 3.3 is higher than the peaking factor indicated in IAC Title 35 (2.8) when considering the entire additional PE of 14,229. For the purposes of this report, the current SWRC peaking factor of 3.3 is used for a conservative projection of future peak flows from growth.

Design Condition	Current Flow (MGD)	Additional Flow from Growth (MGD)		Total Flow (MGD)
		Naperville (PE = 14,229)	Warrenville (PE = 9,600)	
Annual Average	20.07	1.42[a]	0.96[a]	22.45
Maximum Month	32.22	1.99[b]	1.34[b]	35.56
Maximum Week	43.42	2.70[c]	1.77[d]	47.89
Maximum Day	61.42	4.41[e]	1.77	67.60
Peak Hour	65.64	4.70[f]	2.85	73.19
Peak Instantaneous	67.43	4.84[g]	2.85[h]	75.12

[a] Growth at 100 gallons per PE per day
[b] Peaking factor = 1.4
[c] Peaking factor = 1.9
[d] Maximum week flow from the City of Warrenville assumed to be limited to permitted maximum day flow
[e] Peaking factor = 3.1
[f] Peaking factor = 3.3
[g] Peaking factor = 3.4
[h] Peak instantaneous flow from the City of Warrenville assumed to be limited to permitted peak hourly flow

Table 27 Projected Flows with Planned Developments and Vacant Parcels

Design Condition	Current Loading (lbs/day)	Additional Loading from Growth (lbs/day)		Total Loading (lbs/day)
		Naperville (PE = 14,229)	Warrenville (PE = 9,600)	
Annual Average				
BOD_5	24,500	2,400	1,600	28,500
TSS	34,600	3,000	2,000	39,600
TKN	4,480	400	270	5,150
TP	830	70	50	950
Maximum Month				
BOD_5	30,600	2,880	1,920	35,400
TSS	43,900	3,600	2,400	49,900
TKN	5,220	440	300	5,960
TP	1,000	80	60	1,140
Maximum Week				
BOD_5	39,400	3,840	2,560	45,800
TSS	66,300	5,700	3,800	75,800
TKN	5,990	520	350	6,860
TP	1,330	110	80	1,520
Maximum Day				
BOD_5	60,800	6,000	4,000	70,800
TSS	174,000	14,700	9,800	198,500
TKN	9,110	800	540	10,450
TP	2,080	180	130	2,390

Notes: Peaking factors used are presented in Table 22

Table 28 Projected Loadings with Planned Developments and Vacant Parcels

Based on this analysis, the projected future average flow of 22.45 MGD when considering planned developments and vacant incorporated parcels is less than the current design average flow of 26.25 MGD. If the existing design average flow is maintained, this results in a reserve capacity of approximately 3.80 MGD. However, the projected peak flows and average BOD_5 and TSS loadings (without additional reserve) are greater than the current design loading of the facility as a result of higher influent concentrations than were used in the development of the existing design criteria. A more detailed evaluation of future loadings, reserve capacity, and future design criteria are presented later in this report.

B. Facility Planning Area Evaluation

An evaluation was also conducted for the entire Naperville FPA to compare the projected future flows using planned developments and vacant parcels presented earlier to those using population projections within the entire Naperville FPA. While there may not currently be plans for the City to provide sewer service to many of these parcels, this evaluation will project the ability of the SWRC to serve additional areas while maintain the existing design average flow, as well as assist in the consideration of desired peak flow and loading reserve capacity for unforeseen future conditions.

The Chicago Metropolitan Agency for Planning (CMAP) has developed population projections for the City and the City of Warrenville through the year 2050, as presented in Table 29. Unincorporated areas within the Naperville FPA were also evaluated using CMAP's local allocation zones (zones for which individual population projections are made) and were adjusted for zones that crossed the Naperville FPA boundary.

	2020[b]	2030[b]	2040[b]	2050[b]
City of Naperville	149,783	159,587	165,961	168,206
City of Warrenville	13,909	14,934	15,621	16,127
Unincorporated Areas in Naperville FPA[a]	10,654	11,319	11,335	11,653
Total	**174,346**	**185,840**	**192,917**	**195,986**

[a] Using percentage of area within the FPA for allocation zones that cross the FPA boundary.
[b] Population Projections from CMAP ON TO 2050 planning document.

Table 29 CMAP Population Projections

These projections estimate a 30-year growth of approximately 12 percent. The CMAP 2050 population projection for the City is approximately 12,800 persons higher than that determined using the residential PEs in planned and vacant land within the City and accounting for developments in zones that are not included in CMAP's City population projections (such as Wagner Farms or the Polo Club). This may be a result of CMAP projections not taking into account City zoning requirements, such as considering open land and parks as buildable sites, or assuming higher density developments in areas of the City to accommodate growth. The City of Warrenville 2050 CMAP population projection is slightly lower than that included in the City of Warrenville MOU. Based on the 2050 CMAP population values, there are projected to be approximately 11,653 people residing in unincorporated areas within the Naperville FPA. When adjusting this value to account for areas already included in planned developments (CMAP includes Wagner Farms in unincorporated areas) or the City of Warrenville analysis, the CMAP-projected 2050 unsewered population within the FPA is approximately 11,200. Using the CMAP projections, if the City were to consider additional growth within the City and service to currently developed but unincorporated areas within the FPA, this would result in approximately 24,000 PE (11,200 in unincorporated areas and 12,800 in the City) in addition to those presented in Table 27. At 100 gcd, this would result in an increase in average day flow of approximately 2.4 MGD.

FUTURE FLOW AND LOADING SUMMARY

Table 30 presents a summary of the existing design criteria of the SWRC compared to several potential design scenarios. Scenario A includes the permitted flow from the City of Warrenville and planned developments and vacant land within the existing City limits. Scenario B includes the items in Scenario A but also adds service to currently unincorporated parcels within the FPA, most of which are currently developed (additional PE is 11,200). Scenario C includes the items in Scenario B but also adds the additional population growth within the City as projected by CMAP (additional PE is 12,800). As presented, each of these scenarios results in a projected average day flow less than the current design average flow but results in maximum day flows and design loadings that exceed the current design conditions. Note that the values presented for Scenarios A, B, and C do not include any reserve capacity for unforeseen residential, commercial, or industrial growth or

redevelopment. In Scenario D, the existing facility design average flow of 26.25 MGD is maintained and it is assumed that the design average flow capacity in excess of that projected for growth would be held as reserve capacity. This design average flow reserve capacity is then used to determine various loading reserve capacities, assuming 100 gcd per PE and the per capita loadings indicated. This results in a reserve capacity in the range of 6 to 17 percent when compared to the three scenarios presented.

	Current Design and Future Expansion in Permit	Scenario A: Existing Service Area with Planned Developments and Vacant Incorporated Parcels	Scenario B: Planned Developments, Vacant Incorporated Parcels and Service to Unincorporated Areas in FPA[a]	Scenario C: Planned Developments, Service to Unincorporated Areas in FPA, and CMAP Projection for Growth in City[b]	Scenario D: Maintain Existing DAF with Reserve Loading Capacity at 100 gcd
Flows (MGD)					
Average Day	26.25 and 30.00	22.45	23.57	24.85	26.25
Maximum Day[c]	55.13 and 63.00	67.60	71.08	75.04	79.37
Loading (lbs/day)					
Average BOD_5	27,400 and 31,300	28,500	30,400[d]	32,600[d]	35,000[d]
Average TSS	39,400 and 45,000	39,600	42,000[e]	44,700[e]	47,600[e]
Average TKN	-	5,150	5,500[f]	5,900[f]	6,300[f]
Average TP	-	950	1,000[g]	1,100[g]	1,200[g]

[a]CMAP 2050 population for unincorporated areas that are not already included in planned developments (11,200).
[b] CMAP projected growth within City limits less growth already included in planned developments (12,800).
[c] Peaking factor = 3.1 for growth in the City
[d] Growth at 0.17 pcd
[e] Growth at 0.21 pcd
[f] Growth at 0.028 pcd
[g] Growth at 0.0052 pcd

Table 30 Future Flows and Loading Summary Under Various Scenarios

CONCLUSIONS

Several potential future flow and loading scenarios were developed in this report based on existing SWRC data, planned developments, vacant parcels, IGAs with the City of Warrenville, and future population projections. In each scenario developed, the average flow is not projected to exceed the current design average flow. However, peak flow and average loadings are projected to exceed the current design values. While an extensive capacity evaluation of the existing unit processes is beyond the scope of this report, it is anticipated that converting to BNR along with an increase in design maximum flow, peak flow, and BOD_5 and TSS loadings will require an increase in capacity of several unit processes, including biological treatment, clarification, filtration, and disinfection. An increase in influent pumping and preliminary treatment capacity may also be warranted. Additional peak flow reserve capacity may also

be beneficial should the current operation of the storage lagoons change through regulatory pressure, such as requiring flow that has historically been discharged from the lagoons to be conveyed to the SWRC. As the City moves forward with facility planning, the flows and loadings presented herein can be used to evaluate existing unit processes and determine appropriate design criteria with the desired level of reserve capacity. This includes the potential for phasing improvements to cost-effectively meet the City's near and long-term needs.