

DULUTH PUBLIC UTILITIES COMMISSION

Tuesday, February 16, 2016

City Council Chambers

AGENDA

1. Roll call
2. Approval of previous meeting minutes
3. Old business:
 - 3.1 16PUC-002 - RESOLUTION OF THE DULUTH PUBLIC UTILITIES COMMISSION RECOMMENDING THAT THE CITY OF DULUTH AMEND SECTION 48-27 OF THE CITY CODE AUTHORIZNG AUGMENTED CHARGES FOR UNAUTHORIZED TURNING ON OF WATER OR GAS SERVICE. (revised)
 - 16-0Valve O - AN ORDINANCE AUTHORIZING A PENALTY FOR UNAUTHORIZED TURNING ON OF WATER OR GAS SERVICE AMENDING SECTION 48-27 OF THE DULUTH CITY CODE, 1959, AS AMENDED. (revised)
 - 3.2 Water utility discussion
4. New business:
 - 4.1 16PUC-003 - RESOLUTION SEEKING TO PROVIDE A SUSTAINABLE ALTERNATIVE TO STORMWATER MANAGEMENT AND THEREBY REDUCE IMPERVIOUS SURFACE DEVELOPMENT IN SENSITIVE AREAS ALONG DULUTH'S TROUT STREAMS SO AS TO IMPROVE WATER QUALITY AND REDUCE NEGATIVE IMPACTS OF FLOODING. (Sellner)
5. Updates from staff
6. Upcoming Council actions
7. Commissioner questions or comments
8. Preview of upcoming business

DULUTH PUBLIC UTILITIES COMMISSION
Meeting Minutes
January 19, 2016

Members Present: Councilor Zack Filipovich, Rob Prusak, Jim Ramnes, Linda Sellner, Councilor Joel Sipress, Jason Thorsell

Members Absent: none

Staff Present: Bob Asleson, Jim Benning, Liz Bieter, Leanna Gilbert, Howard Jacobson, Eric Shaffer, Glenn Strid

Call to Order: The meeting was called to order at 5:18 p.m. by President Prusak.

Approval of previous meeting minutes

The agenda was amended at the request of Councilor Sipress to move the election of officers ahead of the water utility discussion.

Old business:

Utility appeal procedures:

General

The proposed amendments were tabled at the previous meeting so that staff could ask the City Clerk if they needed record of utility appeals. They do not need these records. Commissioner Filipovich motioned to approve the proposed changes and the motion was approved unanimously.

Cold weather

At the previous meeting, commissioners requested alternatives for implementing the cold weather rule in our City Code. Bob Asleson submitted the following two options. There is an inconsistency between our City Code and state statute regarding restoration of service during the appeal process, and this inconsistency is addressed in both options.

16-0cold O - AN ORDINANCE ADOPTING SPECIAL PROCEDURES PERTAINING TO TERMINATION OF NATURAL GAS SERVICE DURING THE COLD WEATHER RULE PERIOD, AMENDING ARTICLE XV OF CHAPTER 48 OF THE DULUTH CITY CODE, 1959, AS AMENDED TO ADD A NEW SECTION 48-239.1. (Option #1)

This first option adopts the state statute by reference.

16-0cold-1 O - AN ORDINANCE ADOPTING SPECIAL PROCEDURES PERTAINING TO TERMINATION OF NATURAL GAS SERVICE DURING THE COLD WEATHER RULE PERIOD, AMENDING ARTICLE XV OF CHAPTER 48 OF THE DULUTH CITY CODE, 1959, AS AMENDED TO ADD A NEW SECTION 48-239.1. (Option #2)

This second option includes the text of the state statute in the City code.

After some discussion and clarification that notifications are sent out annually about the cold weather rule and information is available on the website, Vice President Ramnes motioned to adopt 16-0cold O (option #1) and that option was approved unanimously.

16PUC-001 - RESOLUTION OF THE DULUTH PUBLIC UTILITIES COMMISSION RECOMMENDING THAT THE CITY OF DULUTH ADOPT SECTION 48-239.1 OF THE CITY CODE CLARIFYING THE APPLICATION OF THE STATE'S COLD WEATHER RULE.

Commissioner Sipress motioned to approve 16PUC-001 and the resolution was unanimously approved.

16PUC-002 - RESOLUTION OF THE DULUTH PUBLIC UTILITIES COMMISSION RECOMMENDING THAT THE CITY OF DULUTH AMEND SECTION 48-27 OF THE CITY CODE AUTHORIZNG AUGMENTED CHARGES FOR UNAUTHORIZED TURNING ON OF WATER OR GAS SERVICE.

After the discussion at the previous meeting, Bob Asleson drafted a suggested ordinance authorizing charges for the unauthorized turning on of services. The drafted ordinance authorizes charges of three times the normal volume rate for actual or estimated product stolen in addition to a penalty per occurrence.

16-0Valve O - AN ORDINANCE AUTHORIZING A PENALTY FOR UNAUTHORIZED TURNING ON OF WATER OR GAS SERVICE AMENDING SECTION 48-27 OF THE DULUTH CITY CODE, 1959, AS AMENDED.

After some discussion, Commissioner Filipovich motioned to amend the proposed ordinance to strike out "three times" in part (b) of Section 1 and the amendment was unanimously approved.

Commissioners also agreed that part (c) of Section 1 should be clarified regarding the legality of progressive penalties.

New business:

Election of officers

Commissioner Sipress nominated Commissioner Prusak for President. Commissioner Ramnes nominated Commissioner Thorsell for Vice President. These nominations were then unanimously approved.

Water utility discussion

Eric Shaffer stated that the water utility is below where we would like it to be per the estimated cash balances that were shown in the budget and it will get worse by the end of 2016. Also, water main replacements have to follow street projects. Superior Street construction is planned to begin in 2017 instead of 2018, resulting in higher expenditures in 2017 than originally anticipated. In addition to that, contract negotiations will likely include a wage increase for AFSCME employees. Staff has not put together any numbers yet but will likely recommend a 3-6% rate increase in the near future in addition to cutting or moving back capital projects. The adopted budget, estimated cash balances, and a 3-6% rate increase would not include the replacement of the 42" main as discussed in previous meetings. Staff will look at the water model once the program is up and running and research other options besides replacement this summer. Staff will find the information regarding the last water rate increase and class changes as requested by Commissioner Sellner and put together some numbers.

Updates from staff

Eric Shaffer reported that Lift Station 8 is the only project still going. They ran the new pumps today to test them. It should be operational this week or next. Engineering staff are designing things for next summer. Jim Benning stated that the first batch of letters for the bleeder list was sent out. This is a preventive measure against frozen services. There have only been a couple of frozen services so far this winter. A second set of letters will be sent once the frost gets a little deeper. If the frost goes really deep, then a third set will be sent out.

Upcoming Council actions

There is a resolution appointing Em Westerlund to the Duluth Public Utilities Commission. There are two resolutions for water treatment chemicals, aluminum sulfate and sodium hydroxide. Jim Benning will be sending out a memo to City Council with information about these chemicals. Commissioner Sellner asked if there had been any repercussions regarding the sale of aluminum sulfate at exorbitant prices. Jim Benning answered that we are part of a class action lawsuit that is ongoing.

Commissioner questions or comments

Commissioner Sellner referenced a press release from a few months ago regarding the wrap up of the 4th Street water main project and the lining of a small section of main. Eric Shaffer stated that one section of 24" pipe was lined and two sections were open cut. Commissioner Sellner inquired about plans for further water main replacement on 4th Street. Eric Shaffer answered that from 16th Avenue East to Wallace there is a 6" main that will be pipe burst to an 8" main. Portions that have rock will not be pipe burst. From 12th Avenue East to 6th Avenue East there is a 6" main that will be replaced with a 24" main. This will all be open cut.

Commissioner Sellner mentioned that she has been unable to meet with Planning about tax forfeit properties so far. She plans to talk to them soon in part because of the flood recovery grant that the City has applied for. She will bring a resolution to the Commission soon regarding cost-free ways to get tax forfeit properties along streams put into conservation. This resolution would be a recommendation for City Council, as they are an entity that has legal rights to get tax forfeit properties.

Commissioner Filipovich announced that Em Westerlund will be replacing Jen Julsrud on the Commission. She is also the Public Works and Utilities Committee chair this year.

President Prusak inquired about the water model that Eric Shaffer had mentioned earlier. Eric Shaffer stated that the model had been discussed a few months ago and would help us decide whether the size of the 42" main was appropriate. The water model will be done by the same company that did the gas model. The model should be ready to use in August, and then staff can determine what size the main needs to be to get water into the city.

Preview of upcoming business

The next regular meeting is scheduled for Tuesday, February 16, 2016, at 5:15 p.m. in City Council Chambers. More information will be presented regarding the water utility. Commissioner Sellner may have some information to discuss in February or March.

Adjournment: The meeting was adjourned at 6:36 p.m.

RESOLUTION NO. 16PUC-002

**RESOLUTION OF THE DULUTH PUBLIC UTILITIES
COMMISSION RECOMMENDING THAT THE CITY OF DULUTH
AMEND SECTION 48-27 OF THE CITY CODE AUTHORIZING
AUGMENTED CHARGES FOR UNAUTHORIZED TURNING ON
OF WATER OR GAS SERVICE.**

RESOLVED, that the Duluth Public Utilities Commission hereby recommends that the City of Duluth adopt the attached section 48-27 to the City code authorizing augmenting utility charges to be imposed for using water and gas by unauthorized turning on of water or gas service to a property.

Approved by the DPUC: _____
(date)

Submitted to City Council: _____
(where appropriate) (date)

ATTEST:

Director
Public Works and Utilities
City of Duluth

STATEMENT OF PURPOSE

The purpose of this resolution is to authorize the city to charge for use of water or gas where persons other than authorized city personnel turn on service to a property and the product is consumed without the City's consent.

Section 48-27 currently prohibits non-city personnel from turning on service after the department has turned it off but, if a property owner does so, there is no specific authorization for charging the customer on an estimated basis or for charging the customer at a rate which reflects the department's costs of enforcement and which would also encourage the customer to come into compliance with the code and department policies and so be entitled to apply for and receive service.

This ordinance amendment would allow the city to charge for the product taken at a rate equal to the normal rate and to estimate the volume taken if the exact amount cannot be determined. In addition, the department can impose a penalty for each illegal reconnect.

16-0Valve O

..Title

AN ORDINANCE AUTHORIZING A PENALTY FOR UNAUTHORIZED TURNING ON OF WATER OR GAS SERVICE AMENDING SECTION 48-27 OF THE DULUTH CITY CODE, 1959, AS AMENDED..

..Body

CITY PROPOSAL:

The city of Duluth does ordain:

Section 1. That section 48-27 of the Duluth City Code, 1959, as amended, is hereby amended to read as follows:

Sec. 48-27. Turning on gas meter stop or water curb stop after same shut off by department.

(a) No person whatsoever, other than an authorized employee of the city, shall turn on the supply of gas or water after such gas or water has been shut off by the department.

(b) In the event that someone other than an authorized employee of the city shall turn on the supply of gas or water to any property, the department may impose a charge equal to volume of gas or water supplied to such property times a rate equal to the rate normally charged for such commodity during the term of its consumption. In the event that the volume of gas or water consumed cannot be determined by objective measurement, the department may estimate the volume of gas or water so consumed based on the best available evidence and charge the applicant based on the foregoing rate. An applicant disputing the volume of gas or water as determined by the department shall have the burden of proving the volume of gas or water actually consumed.

(c) In addition to the volume charges authorized pursuant to subsection (b) above, the department may impose a penalty for each unauthorized turning on of water or gas service to any property in an amount established by commission by resolution, which amount may increase over the amount charged for a prior violation on the subject property for each subsequent violation.

(d) The charges arising under this section shall be payable in the same manner and time as normal charges for consumption of gas or water on the served property.

Section 2. That this ordinance shall take effect 30 days after its passage and publication.

..Statement of Purpose

STATEMENT OF PURPOSE: The purpose of this ordinance is authorize the department to impose a surcharge on water and gas when the department has turned

off a service and someone other than the city has turned the service back on and is taking product without authority.

It would authorize the city to charge the served property at a rate equal to the normal rate for the product and, if the volume of product cannot be determined by an objective such as the product meter, to estimate volume based on best available evidence and charge on that basis. A party charged would have the ability to contest the estimate of volume but would have the burden of going forward.

In addition the department can impose a penalty for each illegal re-connect.

Water Main Breaks per Year by Decade

Decade	Breaks per Year
1930's	4
1940's	6
1950's	11
1960's	30
1970's	50
1980's	55
1990's	55
2000's	141
2010's	124

Water Main Breaks by Year

Year Miles of Water Main Number of Breaks

1938	259	5
1939	262	3

Average Number of Breaks per year by decade - 4

Year Miles of Water Main Number of Breaks

1940	267	6
1941	269	2
1942	270	2
1943	270	5
1944	270	8
1945	270	3
1946	271	13

Average Number of Breaks per year by decade - 6

Year Miles of Water Main Number of Breaks

1953	296	8
1954	299	6
1955	301	15
1956	303	11
1957	311	16
1958	315	10

Average Number of Breaks per year by decade - 11

Year Miles of Water Main Number of Breaks

1963	332	21
1964	333	18
1965	334	25
1966	334	22
1967	335	29
1968	341	53
1969	343	45

Average Number of Breaks per year by decade - 30

Year Miles of Water Main Number of Breaks

1970	344	66
1971	345	51
1972	349	59
1973	354	39
1974	355	24
1975	356	33
1976	357	43
1977	360	87
1978	364	
1979	366	

Average Number of Breaks per year by decade - 50

Year	Miles of Water Main	Number of Breaks	
1980	367		
1981	368		
1982	369		
1983	370		
1984	370		
1985	370		
1986	370		
1987	370		
1988	373		
1989	375	55	
Average Number of Breaks per year by decade -			55

Year	Miles of Water Main	Number of Breaks	
1990	378	45	
1991	378	40	
1992	380	39	
1993	384	62	
1994	386	55	
1995	388	51	
1996	390	124	
1997	392	114	
1998	394	94	
1999	395	82	
Average Number of Breaks per year by decade -			71

Year	Miles of Water Main	Number of Breaks	
2000	397	122	
2001	398	125	
2002	398	195	
2003	403	97	
2004	406	187	
2005	408	139	
2006	408	130	
2007	424	163	
2008		146	
2009		104	
Average Number of Breaks per year by decade -			141

2010		98	
2011		103	124
2012		112	
2013		139	
2014		147	
2015		142	

2016 Water Utility Rate Increase Example

Effects by Household Size for Residential Customers: Rate R-1

1/27/2016

No Change to Fixed Rate
+ 3% (\$.10 per ccf) Variable Rate

Duluth City Persons per Household Estimate = 2.22 persons

2014 estimates of city and township population, households and persons per household

Minnesota State Demographic Center and the Metropolitan Council

2015 Average for all Residential rate classes = 6.1 ccf per month

Duluth Public Works and Utilities; Water Utility Data

Average Household

Estimated 2016 Average per Month

	<u>CCF/Month</u>	<u>Rate</u>	<u>Total</u>
fixed			\$6.27
variable	6	\$3.31	<u>\$19.86</u>
			\$26.13 per month

↓

4,488 gallons/month
150 gallons/day
68 gallons per person (based on 2.22 persons)

Monthly Average with 3% Increase

	<u>CCF/Month</u>	<u>Rate</u>	<u>Total</u>
			\$6.27
	6	\$3.41	<u>\$20.46</u>
			\$26.73 per month

Rate Increase = **\$0.60 per month**
x 12
\$7.20 per year

Single Senior Household

Estimated 2016 Average per Month

	<u>CCF/Month</u>	<u>Rate</u>	<u>Total</u>
fixed			\$6.27
variable	2	\$3.31	<u>\$6.62</u>
			\$12.89 per month

↓

1,496 gallons/month
50 gallons/day

Monthly Average with 3% Increase

	<u>CCF/Month</u>	<u>Rate</u>	<u>Total</u>
			\$6.27
	2	\$3.41	<u>\$6.82</u>
			\$13.09 per month

Rate Increase = **\$0.20 per month**
x 12
\$2.40 per year

2016 Water Utility Rate Increase Example

Effects by Household Size for Residential Customers: Rate R-1

1/27/2016

No Change to Fixed Rate
+ 6% (\$.20 per ccf) Variable Rate

Duluth City Persons per Household Estimate = 2.22 persons

2014 estimates of city and township population, households and persons per household

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Duluth Public Works and Utilities; Water Utility Data

Average Household

Estimated 2016 Average per Month

	<u>CCF/Month</u>	<u>Rate</u>	<u>Total</u>
fixed			\$6.27
variable	6	\$3.31	<u>\$19.86</u>
			\$26.13 per month

↓

4,488 gallons/month
150 gallons/day
68 gallons per person (based on 2.22 persons)

Monthly Average with 6% Increase

	<u>CCF/Month</u>	<u>Rate</u>	<u>Total</u>
			\$6.27
	6	\$3.51	<u>\$21.06</u>
			\$27.33 per month

Rate Increase = \$1.20 per month
x 12
\$14.40 per year

Single Senior Household

Estimated 2016 Average per Month

	<u>CCF/Month</u>	<u>Rate</u>	<u>Total</u>
fixed			\$6.27
variable	2	\$3.31	<u>\$6.62</u>
			\$12.89 per month

↓

1,496 gallons/month
50 gallons/day

Monthly Average with 6% Increase

	<u>CCF/Month</u>	<u>Rate</u>	<u>Total</u>
			\$6.27
	2	\$3.51	<u>\$7.02</u>
			\$13.29 per month

Rate Increase = \$0.40 per month
x 12
\$4.80 per year

RESOLUTION NO. 16PUC-003

RESOLUTION SEEKING TO PROVIDE A SUSTAINABLE ALTERNATIVE TO STORMWATER MANAGEMENT AND THEREBY REDUCE IMPERVIOUS SURFACE DEVELOPMENT IN SENSITIVE AREAS ALONG DULUTH'S TROUT STREAMS SO AS TO IMPROVE WATER QUALITY AND REDUCE NEGATIVE IMPACTS OF FLOODING.

RESOLVED, that the Duluth Public Utilities Commission (the "Commission") hereby makes the following Findings of Fact:

- 1.) In 1998, pursuant to Article XI of Chapter 43 of the Duluth City Code, 1959, as amended (the "Code"), the City of Duluth established the City's "Stormwater Utility" to operate, maintain and improve the City's "Stormwater Drainage System" as said terms are defined in Section 43-65 of the Code with the stated purpose of providing a fair and organized method of maintaining a stormwater drainage system that will meet the future needs of the citizens of Duluth through the establishment of a reasonable and practical methodology for making stormwater utility charges;
- 2.) The Stormwater system includes constructed and natural stormwater drainage to creek channels of the City and is operated by the Stormwater Utility to, among other things, control discharges necessitated by rainfall events, incorporate methods to collect, convey, store, absorb, inhibit, treat, use and reuse water to prevent or reduce flooding, over-drainage, environmental degradation and water pollution or otherwise affect the quality and quantity of discharge from the City;
- 3.) Pursuant to Section 50-18.1 E. 1.(a)(i) of the Code, the City is required to include in its Municipal Separate Storm Sewer System ("MS4") Permit a goal of non-degradation of receiving water body water quality;
- 4.) Pursuant to the City's MS4 SWPPP Application for Reauthorization effective August 1, 2013, the City acknowledged having established a partnership with the Regional Stormwater Protection Team ("RSPT") whose mission is stormwater pollution prevention and whose stated purpose is to reduce stormwater peak flows and pollutant loads within the Western Lake Superior Watershed;
- 5.) St. Louis County, in its Comprehensive Water Management Plan 2010-2020,-has identified Priority Concern #,1 which includes recognition of shoreland vegetation as a buffer to help prevent erosion and clean water through natural processes and- Priority Concern #3 Ground and Surface Waters, which recognizes that minimizing impervious area along Shoreline Areas allows for natural absorption and slows the direct flow to the water body; the St. Louis County Board has jurisdiction over the disposition of tax-forfeit land parcels;
- 6.) Pursuant to said Plan, St. Louis County has established a goal of supporting and assisting local governments with stormwater management;
- 7.) Pursuant to Statute, the St. Louis County Board has the authority to recommend to the State Commissioner of Revenue the conveyance of property forfeited to the State for non-payment of real estate tax to local jurisdictions for public

purposes;

- 8.) That Duluth's unique geographic location and topography includes 42 streams that bisect the City, including 16 DNR-designated trout streams that should provide habitat for aquatic biota including brown and brook trout;
- 9.) That the Commission is charged with providing long-term guidance to Stormwater Utility operations and, in doing so, must recognize the likelihood of increased frequency of severe precipitation events (like the flood of 2012) to negatively affect water quality and overwhelm the conveyance system; and

RESOLVED FURTHER, that based on and because of the facts found above, the Commission does hereby recommend that the City of Duluth pursue acquisition of undeveloped greenspace bordering its 16 trout streams which is currently forfeited to the state of Minnesota for non-payment of real estate taxes for the public benefit of improving water quality and flood control under DNR management.

FURTHER RESOLVED, that the City request the assistance and cooperation of the St. Louis County Board in acquiring such property in furtherance of their established goal of supporting and assisting local governments with stormwater management.

Approved by the DPUC: _____
(date)

Submitted to City Council: _____
(where appropriate) (date)

ATTEST:

Director
Public Works and Utilities
City of Duluth

STATEMENT OF PURPOSE

This resolution seeks to provide direction and to increase options within municipal stormwater management to include sustainable practices that meet stated goals and regulations and to affirm current trends toward recognizing natural vegetation buffers as conducive to improving water quality. Providing natural expandable area for stream channel size constitutes a form of flood control.

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WATER: OGDEN REBUILDS THE
BACKBONE OF ITS SYSTEM

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EDUCATION TO IMPROVE YOUR UTILITY

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TAKING CONTROL OF OVERFLOWS

Duluth tackles serious inflow and overflow
problems and completes consent decree
requirements ahead of schedule

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Todd Carlson,
Duluth Utility Operations Division,
Duluth, Minnesota


wwett

Water & Wastewater Equipment,
Treatment & Transport Show

February 17-20, 2016
Indiana Convention Center
Indianapolis, Indiana

WWETT SHOW
EDUCATIONAL

CLASSES

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Duluth Public Works and Utilities operator Chris Anderson watches the gauges on a Vactor 2100 while cleaning a sewer main. (Photography by Matthew Moses)

TAKING CONTROL OF OVERFLOWS

Duluth tackles serious inflow and overflow problems and completes consent decree requirements ahead of schedule

By Jim Force

“Without them, nothing would have happened.”

That’s Todd Carlson, program coordinator in the engineering office of the Duluth, Minnesota, Department of Public Works and Utilities, talking about his city’s successful program to eliminate wet weather overflows and meet the terms of a consent decree a year ahead of the deadline.

By “them,” he’s not referring to consultants, contractors, regulators or city officials. He means the public.

“The public was a critical part of this project,” Carlson says. “Sixty percent of our sewer system is on private property. Without the cooperation of our property owners in our city, we’d still be fighting the problem.”

“We needed to eliminate wet weather overflows at the source. Every gallon we removed was one less gallon to overflow or overwhelm the treatment plant. In that first year, we got some really good things done.”

– Todd Carlson

Wet weather issues

Age and topography have had a lot to do with wet weather overflows in Duluth. The infrastructure is old, with many sewers consisting of 8-inch clay lines dating to the late 1800s. Plus, homes and businesses are situated on a steep ridge that drops about 800 feet to the shore of Lake Superior.

In a previous *Municipal Sewer & Water* article on the utility, John Center, project coordinator for sanitary sewer overflows, described how flows come straight downhill at 40 mph to T-connec-

tions at the interceptors. “We’ve had data loggers in manholes simply washed away,” he reported.

Through the interceptors, Duluth contributes an average daily flow of about 10 mgd to the regional Western Lake Superior Sanitary District Plant.

Even more problematic are the foundation drains, common to homes and buildings constructed before 1970. These drains come to a center manhole in the basement, connected to a 6-inch iron pipe. “Eighty percent of our build-

(continued)



PROFILE:

Utility Operations Division,
Department of Public Works
and Utilities, Duluth,
Minnesota

ESTABLISHED:

1999 through merger of water and gas departments; city utility dates to the 1898 purchase of Duluth Water and Gas Company

POPULATION SERVED:

86,000

AREA:

87 square miles

INFRASTRUCTURE:

400 miles of sewer mains,
52 lift stations, 400 miles of storm
sewers, 100 miles of storm ditches

STAFF:

45

ANNUAL BUDGET:

\$4.2 million

WEBSITE:

www.duluthmn.gov



Clockwise from left: **Erick Fronden** removes a manhole lid to investigate a potential I&I issue as **Todd Carlson** looks on; **Chris Anderson** checks the controls of the Vactor 2100 while cleaning a sewer line with **Erick Fronden** and **Brice Aikin**; a look down the manhole with the jetter hose inside the sewer line.

ings had that,” Carlson explains. The design caused frequent hydraulic overflows and basement backups, contributing both to wet weather overflows and citizen complaints.

Leaky sewer laterals, averaging about 60 feet

“Our I&I reduction project really started in the early 1990s,” Carlson says. “Our city staff recognized the need to separate the foundation drains and install sump pumps in the basements.”

“Sixty percent of our sewer system is on private property. Without the cooperation of our property owners in our city, we’d still be fighting the problem.”

– **Todd Carlson**

from home to street, contributed even more to storm flows in the system. Carlson estimates that between 1995 and 2004, Duluth averaged 30 overflows per year, amounting to 47 million gallons all told. Many were in the downtown business and hotel district.

Fixing the problems

Duluth’s program to eliminate the overflows is not new, although the consent decree, signed in 2009, gave the effort a big boost.

In 1994, largely through the efforts of Steve Lipinski, manager of utility operations, Duluth was able to get the state Legislature to pass legislation that allowed public money to be used on private property. That move paved the way for the city to help property owners disconnect their foundation drains and install sump pumps, as well as improve landscaping and steer downspouts away from foundations.

“We needed to eliminate wet weather overflows at the source,” Carlson says. “Every gallon
(continued)”



A crew from the Duluth Utility Operations Division recontours a ditch for stormwater conveyance.

“By mail, we invited homeowners to public meetings where we could show the videos. We used the videos to teach and to convince property owners they had a problem. TV has been a great tool for us.”

– Todd Carlson

we removed was one less gallon to overflow or overwhelm the treatment plant. In that first year, we got some really good things done.”

Still, the city experienced occasional overflows, with every incident resulting in a violation. Then in 2003, excessive rain and snow produced an abnormally wet year, with numerous releases coupled with power outages. That, according to Carlson, brought a cease and desist order from state and federal agencies in 2004 and galvanized public awareness. “We knew we needed to get this fixed,” Carlson recalls.

As negotiations leading to the consent decree commenced in 2004, Duluth redoubled efforts to eliminate overflows, focusing on leaky laterals and the basement foundation drains. “We continued to push,” Carlson says. “That carrot at the end of the stick (consent decree) really helped.

“The key was to work upstream in the basins with the most inflow and infiltration,” Carlson says. “It was critical to know what was coming into the system.”

Divide and conquer

Based on seven designated consent decree overflow points around the system, Duluth had divided the city into 30 sub-basins, with one additional basin added later on. Extensive flow monitoring was conducted in each basin, using Teledyne Isco 4150 Series flow loggers and 2100 Series flow modules, which have a temperature reading feature that enables the team to measure runoff from the spring snowmelt because of the temperature change of the water.

The goal was to search out 250 homes and identify at least 175 candidates a year for lateral

replacement. Crews used an Explorer mainline pan-and-tilt camera from UEMSI to inspect block-to-block during wet weather. In addition, manholes were opened during rain events to visually monitor flow. “We worked in those basins where we saw the most water,” Carlson says. “We used city crews for the work, rather than an outside contractor.”

Lateral connections were televised from the city mains. When the inspections revealed problems, the videos were shown to homeowners. “By mail, we invited homeowners to public meetings where we could show the videos,” Carlson explains. “We used the videos to teach and to convince property owners they had a problem. TV has been a great tool for us.”

Duluth also initiated a demonstration program showing how laterals could be lined with CIPP technology instead of open cuts.

The city sweetened the deal by providing grants to fund a large portion of the sump pump and lateral replacement programs. Up to \$2,150 was available as a grant for disconnection of the footing drain, removal of the house trap, and the

CAPTURING OVERFLOW

Duluth has spent a lot of time and money on the private side of its sewer system in an effort to eliminate wet weather sewer overflows. Overflow storage tanks were another important part of the city's remediation effort.

Seven overflow storage tanks, with a combined capacity of about 16.5 million gallons, have been built along the city's lakeshore. The tanks are designed to harmonize with their surroundings, built belowground with

landscaping on top.

The city needed the tanks because of the deadlines it faced, says John Center, project coordinator for sanitary sewer overflows. Now that compliance with the consent decree has been reached, the tanks are serving as a safety net and will also allow the city to control the flow it delivers to the regional treatment plant.

installation of a sump pump to reroute the water outside. Plus, the city paid 80 percent of the first \$5,000 required to replace or rehabilitate (CIPP lining) a failing lateral.

Carlson says the lateral reimbursement funds come from a clean-water fee on the utility bill implemented in 2009. Funds to install sump pumps came from a rate increase of 10 to 15 percent enacted during the mid-1990s. "That was the biggest bang for the buck — installing the sumps and getting the storm flows outside the house and away from the foundation," Carlson says.

The clean-water surcharge fee is used to fund the lateral grant program and capital improvement costs related to the wastewater storage tanks; this funding will sunset in 2018.

Once a property owner agreed to remediate the issue, the city continued to engage and support. "We gave the property owners the control," Carlson says. "It was not us as city employees making the decisions. We allowed them to pick the contractor. We could send the grant money directly to the contractor, or to the homeowner who could then pay the contractor when the work was completed to their satisfaction. We held their hand through the whole process."

The extra efforts to create a partnership with customers have paid off handsomely. Not only has the consent decree deadline been met with time to spare, Carlson estimates the overflow prevention program is removing an average of 29 million gallons per rain event. "Except for severe flooding in 2012, we haven't had an overflow since 2010," he says.

"With the help of the public, we've taken control of the system, rather than the system controlling us." ♦

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