

# Willowbrook

835 Midway Drive  
Willowbrook, IL 60527-5549

Phone: (630) 323-8215 Fax: (630) 323-0787 [www.willowbrookil.org](http://www.willowbrookil.org)

Mayor

Frank A. Trilla

Village Clerk

Leroy R. Hansen

Village Trustees

Sue Berglund

Umberto Davi

Terrence Kelly

Michael Mistele

Gayle Neal

Paul Oggerino

Village Administrator

Tim Halik

Chief of Police

Mark Shelton

Director of Finance

Carrie Dittman

## AGENDA

REGULAR MEETING OF THE MUNICIPAL SERVICES COMMITTEE TO BE HELD ON MONDAY, NOVEMBER 13, 2017, AT 5:30 P.M. AT THE VILLAGE HALL, 835 MIDWAY DRIVE, IN THE VILLAGE OF WILLOWBROOK, DUPAGE COUNTY, ILLINOIS.

1. CALL TO ORDER
2. ROLL CALL
3. APPROVAL OF MINUTES:
  - a) September 11, 2017 Regular Meeting of the Municipal Services Committee
4. REPORT – 75<sup>th</sup> Street Water Main Lining Project:  
Status Update
5. REPORT – Kingery & 63<sup>rd</sup> Street STP Lighting Project:  
Status Update
6. REPORTS – Municipal Services Department:
  - a) September & October 2017 Monthly Permit Activity Reports
  - b) August & September 2017 Water System Pumpage Reports
  - c) September 2017 Scavenger Reports
  - d) September 2017 Mosquito Abatement Program Report
7. VISITOR'S BUSINESS  
(Public comment is limited to three minutes per person)
8. COMMUNICATIONS
  - a) "The Water Drain" - Chicago Tribune
9. ADJOURNMENT



Proud Member of the  
Illinois Route 66 Scenic Byway

MINUTES OF THE REGULAR MEETING OF THE MUNICIPAL SERVICES  
COMMITTEE OF THE VILLAGE OF WILLOWBROOK HELD ON MONDAY,  
SEPTEMBER 11, 2017 AT THE VILLAGE HALL, 835 MIDWAY DRIVE, IN  
THE VILLAGE OF WILLOWBROOK, DUPAGE COUNTY, ILLINOIS

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1. CALL TO ORDER

Chairman Michael Mistele called the meeting to order at 5:35 PM.

2. ROLL CALL

Those present at roll call were Chairman Michael Mistele, Trustee Paul Oggerino, and Village Administrator Tim Halik. Absent: None.

3. APPROVAL OF MINUTES

- a) After review of the draft minutes from the August 14, 2017 regular meeting of the Municipal Services Committee, Chairman Michael Mistele made a motion to approve the minutes as presented. Trustee Paul Oggerino seconded the motion. Motion Carried

4. DISCUSSION – Willowbrook Parks – Corporate Naming, Advertising, and Sponsorship Policy

Administrator Halik reminded the Committee that at the August 14, 2017 regular meeting of the Parks & Recreation Commission, the issue of park naming rights, corporate advertising, and sponsorship was discussed. To recap, Halik advised that a local retailer has offered to donate a sum of money to the Village parks department in return for the ability to sponsor a park amenity, in this case, the new water splash pad currently under construction at Willow Pond Park, in their business name. The Municipal Services Committee considered this matter at their last meeting, but expressed some concerns about the scope of such a program and whether it was appropriate to allow park amenities to be sponsored by local businesses, primarily if such amenities would then be named after those businesses, such as the ACME splash pad. After some discussion, the Committee ultimately authorized staff to draft a policy for further consideration. Halik advised that staff drafted the attached policy using language particularly from two model policies already in place in Oak Park, IL, the Park District of Oak Park, and the Montgomery County Department of Parks, Maryland. Halik shared that those two jurisdictions have implemented similar policies that contained desirable language. As discussed at the last Committee meeting, the draft policy contains the following components:

- Public input derived from Park Commission meetings
- Naming rights open to local businesses
- Specific terms to be set
- The donation to parks should be substantial
- No resulting entitlement
- Includes park amenities or park events only (Not entire parks)

In part, the policy includes the ability for defined entities to name a park asset in return for providing substantial financial or material in-kind support for parks. Park naming must ultimately be approved by the Village Board after receiving a recommendation from the

Park Commission. In addition, written agreements may be made to allow corporate advertising, sponsorship and naming rights for park events, or sponsorship and advertising of park assets in return for providing substantial financial or material in-kind support for parks. These would be approved by the Village Administrator after consultation with the Mayor. Halik advised the Committee that the policy was sent to Attorney Bastian, but he has not yet reviewed it. Chairman Mistle inquired about Park Commission input. Halik responded that the intent would be that the discussions that occur with the park commissioners would be at a public meeting and included on that meeting's posted agenda. Therefore, anyone could attend and speak on that topic. Trustee Oggerino offered that if large park signage is a concern, a centrally located plaque could be installed in the park to recognize, perhaps, gold, silver, and platinum level donors. Each level could correspond to a donation amount. Chairman Mistle thought that was a good idea if we decide to pursue this concept, stating that he would be concerned that such a policy will open Pandora's box, so to speak. In conclusion, the Committee agreed that once the Village Attorney completes his review of the policy, it should be brought to the Village Board to obtain their feedback.

5. REPORT – Municipal Services Department

- a. Administrator Halik reviewed the monthly permit activity report for the month of August 2017. Halik advised that the Village received about \$65,000 in permit revenue for the month. Halik advised that for the first four months of the 2017/18 fiscal year, the department has brought in a total of 79% of the budgeted revenue.
- b. Administrator Halik shared the water system pumpage report for July 2017. The report indicates that the Village pumped 34,333,000 gallons of water in the month. The total amount of water pumped so far in the 2017/18 fiscal year is about 3.8% below the amount of water pumped in the same time period of the previous year. However, we are still on track to meet the 350,000,000 pumpage projection for the year.
- c. Administrator Halik shared the August 2017 scavenger report, and advised that the report was for informational purposes only.
- d. Administrator Halik shared the August 2017 Clarke Mosquito Abatement Program Report, and advised that the report was for informational purposes only.

6. VISITOR'S BUSINESS

(None)

7. COMMUNICATIONS

Administrator Halik advised that the fall brush collection program is tentatively scheduled to occur October 9<sup>th</sup> through the 13<sup>th</sup> and that the same contractor has submitted the lowest proposal, so far.

8. ADJOURNMENT

Motion to adjourn was made by Trustee Oggerino and seconded by Chairman Mistle. The meeting was adjourned at 6:10 PM.

(Minutes transcribed by: Tim Halik, 10/26/17)

**MUNICIPAL SERVICES COMMITTEE MEETING**  
**AGENDA ITEM SUMMARY SHEET**

<b>AGENDA ITEM DESCRIPTION</b>  <b>REPORT – 75<sup>th</sup> Street Water Main Lining Project</b> <b>Status Update</b>	<b>COMMITTEE REVIEW</b> <input type="checkbox"/> Finance/Administration <input checked="" type="checkbox"/> Municipal Services <input type="checkbox"/> Public Safety  <b>Meeting Date:</b> November 13, 2017
<p><input checked="" type="checkbox"/> Discussion Only      <input type="checkbox"/> Approval of Staff Recommendation (for consideration by Village Board at a later date)</p> <p><input type="checkbox"/> Seeking Feedback      <input type="checkbox"/> Approval of Staff Recommendation (for <u>immediate</u> consideration by Village Board)</p> <p><input type="checkbox"/> Regular Report      <input type="checkbox"/> Report/documents requested by Committee</p>	
<b>BACKGROUND</b>  Attached is information received from the contractor, Fer Pal Infrastructure, relating to the Cured-In-Place-Pipe (CIPP) project underway to structurally rehabilitate the Village's 12" diameter underground water main along 75 <sup>th</sup> Street.	
<p>Documents attached:</p> <ul style="list-style-type: none"><li>▪ Certificates</li><li>▪ Manufacturer's Installation Procedure</li><li>▪ Articles / Case Studies</li><li>▪ Technical Data</li><li>▪ Tapping Procedure / SOP</li><li>▪ Shoring System</li></ul>	
<b>REQUEST FOR FEEDBACK (if any)</b>	
<b>STAFF RECOMMENDATION</b>	

2017 – Willowbrook, IL

## Structural Water Main Rehabilitation



*Leaders in Water Main Rehabilitation*

[www.ferpalinfrastructure.com](http://www.ferpalinfrastructure.com)



# Certificates



August 8<sup>th</sup>, 2011

To whom it may concern

**SUBJECT: Confirmation of Fer-Pal Construction status as Licensed Installer for Aqua-Pipe**

The present letter is to confirm that Fer-Pal Construction is a trained and licensed installer of Aqua-Pipe as per our standard licensee contract.

Should you require any further information, please don't hesitate to contact the undersigned.

Your truly,

A handwritten signature in black ink that reads "Sylvain Boissonneault".

Sylvain Boissonneault  
General Manager Aqua-Pipe  
Sanexen Environmental Services Inc

1471 Lionel-Boulet Boulevard, Suite 32  
Varennes (Québec) Canada J3X 1P7

Telephone: (450) 652-9390  
Fax: (450) 652-2290  
E-mail: [info@sanexen.com](mailto:info@sanexen.com)  
<http://www.sanexen.com>

May 28, 2015

Shaun McKaigue  
C.E.O.  
Fer-Pal Construction USA LLC  
26187 Northline Road  
Taylor, MI 48180

**SUBJECT: AQUA-PIPE® Certifications**

Mr. McKaigue,

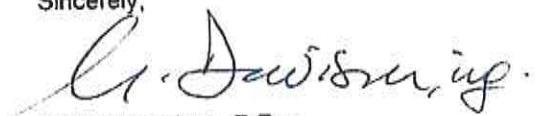
The present letter is in response to your request for certifications to the following criteria for use by Fer-Pal Construction USA LLC, an AQUA-PIPE® licensed installer.

- AQUA-PIPE® is specifically designed for the use in the rehabilitation of water mains, is certified by NSF to NSF/ANSI Standard 61 and can be used for pressures up to 150 psi.
- AQUA-PIPE® has been successfully installed and currently in use in over 3 million feet of pipe in North America.
- AQUA-PIPE® is a compliant AWWA M28 Class IV lining which is fully structural and structurally independent of the host pipe capable of sustaining internal pressures and external loads.
- AQUA-PIPE®, when installed according to the Standard Operating Procedures, will bond to the host pipe as demonstrated in the test report named, "Experimental Evaluation of Select Limit States" in April of 2012.

For more than 14 years, the AQUA-PIPE® product has demonstrated its efficiency and longevity and is why we continue to have confidence in its durability.

Please, do not hesitate to contact the undersigned for any further information.

Sincerely,



Michael Davison, P.Eng.

Product Director – AQUA-PIPE®

9935 Catania Avenue - Entrance 1, Suite 200  
Brossard (Quebec) J4Z 3V4 Canada

Telephone: 450 466-2123  
Fax: 450 466-2240  
E-mail: [info@sanexen.com](mailto:info@sanexen.com)  
<http://www.sanexen.com>

April 29th, 2015

Mr. Gerry Ramsay  
Fer-Pal Construction USA LLC  
26187 Northline Road  
Taylor, MI 48180

Subject: Aqua-Pipe adhesion to host pipe

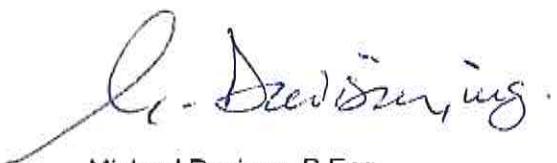
Mr. Ramsay,

This letter is to confirm that the Aqua-Pipe structural liner for drinking water mains is formulated and designed to adhere to a cast iron or ductile iron host pipe when the product is prepared and installed according to Sanexen's Standard Operating Procedures.

Furthermore, the adhesion of the Aqua-Pipe liner was measured to be 2,962 lbs per foot for a 6 in diameter cast iron host pipe. This force was measured under controlled laboratory conditions by the Trenchless Technology Center at Louisiana Tech University.

Should you require any additional information, please don't hesitate to call me.

Best regards,



Michael Davison, P.Eng.  
Product Director, Aqua-Pipe

9935 Catania Avenue - Entrance 1, Suite 200  
Brossard (Quebec) J4Z 3V4 Canada

Telephone: 450 466-2123  
Fax: 450 466-2240  
E-mail: [info@sanexen.com](mailto:info@sanexen.com)  
<http://www.sanexen.com>

# NSF International

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SANEXEN ENVIRONMENTAL SERVICES INC.  
Facility: MONTRÉAL, QUEBEC, CANADA

AS COMPLYING WITH NSF/ANSI 61.  
PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE  
AUTHORIZED TO BEAR THE NSF MARK.



This certificate is the property of NSF International and must be returned upon request. For the most current and complete information, please access NSF's website ([www.nsf.org](http://www.nsf.org)).

David Purkiss, General Manager  
Water Distribution Systems

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April 13, 2005  
Certificate# 0L192 - 01



# Manufacturers Installation Procedure



**SANEXEN**  
ENVIRONMENTAL SERVICES INC.

aquapipe  
Licence R.Q.Q. 2945 6936 50

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**STRUCTURAL REHABILITATION  
OF  
WATER MAINS**

**Sanexen Environmental Services Inc.**

**JULY 2012**

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## 1. INTRODUCTION

The importance of safe drinking water to public health is undisputed. However, as we enter the 21<sup>st</sup> Century, water utilities are faced with aging buried infrastructures. Underground pipes delivering safe drinking water have exceeded their design life. The various pipes installed during different periods in history have different life expectancies, and thousands of miles of potable water pipes that were buried 50 or more years ago will need to be replaced within the next 30 years. In the last 30 years, CIPP (Cured-in-Place-Pipe) technologies have become a standard in rebuilding buried gravity pipeline systems.

Municipalities and Water Districts are turning to innovative technologies provided by the trenchless rehabilitation industry to help solve the economic burden related to the renewal of drinking water infrastructure.

For the last decade, AQUA-PIPE® has been the leading option for the rehabilitation of water mains. The million dollar savings for tax payers/water utility users as well as the capacity for AQUA-PIPE® to reinstate service connections from within the pipeline are what distinguish AQUA-PIPE®'s unique technology from other conventional methods.

Water utility managers can also appreciate the following benefits from the use of AQUA-PIPE®:

- No specialty fittings or specialty training
- No specialty repair equipment needed
- Rapid installation;
- Minimal excavation;
- Minimal impact on traffic;
- Regained structural capacity;
- Capable of lining through bends;
- Improvement in water pressure/flow;
- Corrosion resistance;
- Increase in life span of infrastructures;
- Reduction of Greenhouse Gas Emissions (GHG).



## 2. TYPICAL PROJECT STEPS

Most AQUA-PIPE® installation projects generally include the following steps:

1. Locating the pipe;
2. Installation of temporary water supply;
3. Excavation of access pits;
4. Cleaning of existing pipe;
5. Insertion and curing of liner;
6. Opening of service connections and inspection.

This document is meant to briefly describe the various steps of water main rehabilitation using AQUA-PIPE®.

### 2.1 Locating the Pipe

Unlike sewer mains, water mains are not visible from the surface via manholes. Locating the pipe to precisely determine the position of hydrants and intersections (T connections), service connections as well as elbows and services (occasionally not identified in the plans and often unknown to the water utility).

It is also important to be aware of any other utilities (gas, telecom, etc.) that may be found in the path of the water main to prevent damaging such utilities or infrastructures during the excavation of the access pits.

The location of the water main will dictate each actual location of the access pit on the job site.



Figure 1: Locating the pipe

## 2.2 Temporary Water Supply

The temporary water supply (bypass) is installed on the surface and ensures uninterrupted water service to the residents during the project..

The houses are connected to the bypass system using a hose connected to the outdoor spigot. If required, plumbing may have to be modified to allow feeding the house with drinking water from the garden spigot.

As the host pipe must be isolated from the surrounding houses, cut-off valves from the house are shut and the main stop is turned closed. If required, the main stops will have to be repaired or replaced in order to close them.

The temporary water supply work may be installed by the utility owner and not be included in the scope of work.

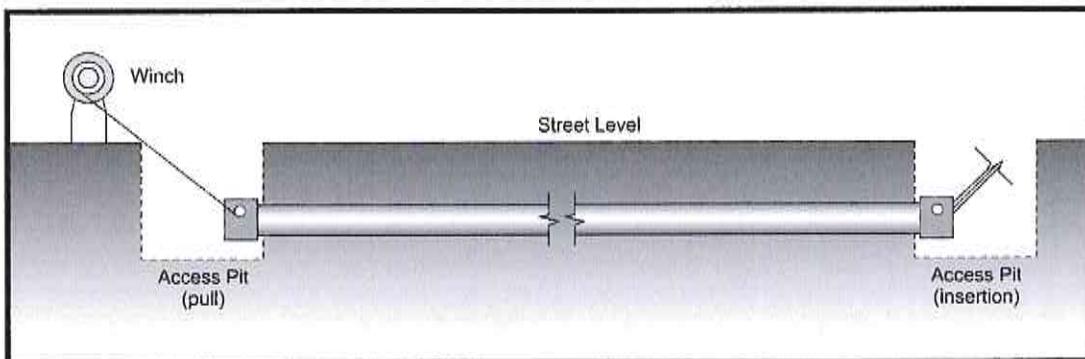


**Figure 2: Temporary Water Supply**

### 2.3 Access Pit Excavations

The water mains are accessed through standard excavated and shored access pits.

Access pits are used as entry and exit points for the liner during insertion as indicated in Figure 3. The liner is pulled inside the existing pipe with the use of a winch located above the exit pit.

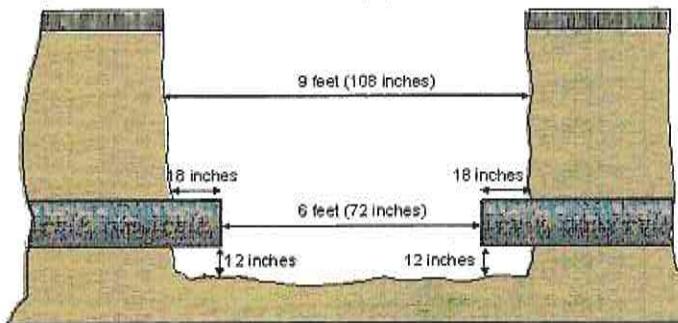


**Figure 3: Access Pits**

The location of access pits will be selected to minimize excavation. Typically, the pits will be placed at water main intersections (tees, crosses, hydrants, etc.) or the pits will be spaced to maximize the length of the sections to be rehabilitated, up to 500 ft, whichever occurs first.

The pits are fitted with a trench box to ensure a safe work environment and proper signage is required for optimal traffic control. As this is a trenchless technique, streets are kept opened to traffic during the project.

As can be seen in the following figures, a typical access pit requires an excavation of 9 ft x 6 ft and a depth of 12 inches below the pipe.



**Figure 4: Access Pit – Side View**

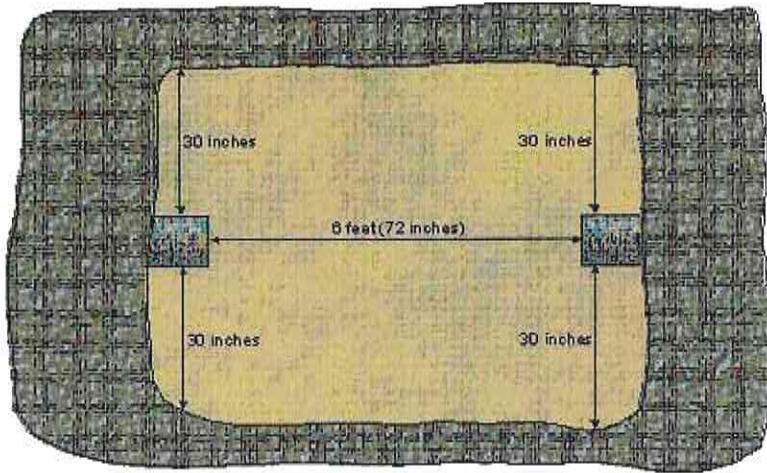


Figure 5: Access Pit – Top View



Figure 6: Trench Box and Fencing



Figure 7: Little or No Impact on Traffic

#### 2.4 Pipe Cleaning

The cleaning of the pipe is a critical step in the rehabilitation of a water main with AQUA-PIPE®. This rust and scale is removed to allow the new composite liner to adhere to the host pipe and restore the flow capacity of the pipe.

After cleaning, the pipe is inspected with a closed circuit television camera (CCTV) to verify that the rust and deposits have been adequately removed.

Cleaning is accomplished using a variety of cleaning tools. Existing stainless steel water main repair clamps do not affect the rehabilitation process since all work is carried out from inside the existing pipe.

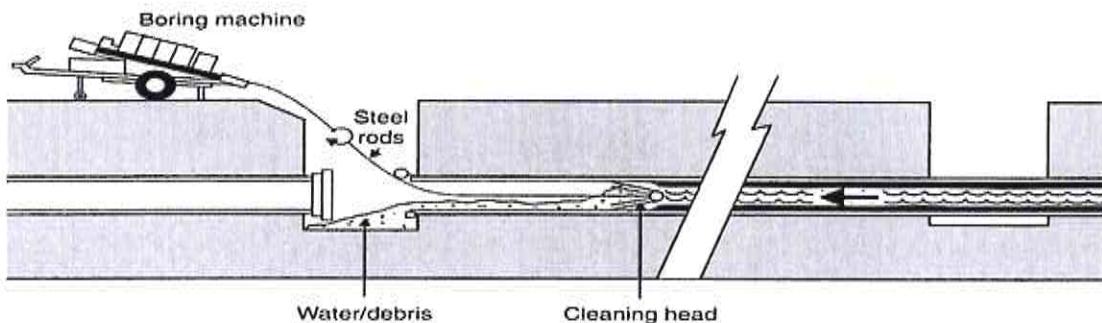


Figure 8: Pipe Cleaning



Figure 9: Water Main Before Cleaning

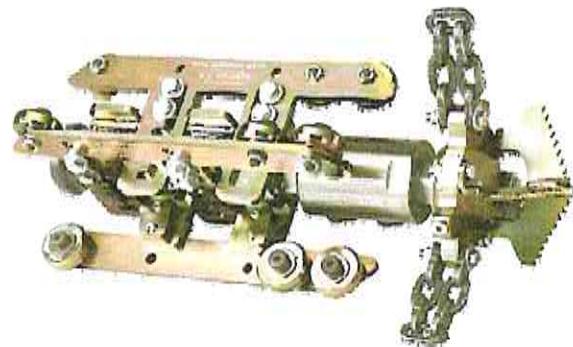


Figure 10: Cleaning Head

## 2.5 Inspection and Plugging

Rehabilitation of a water main with AQUA-PIPE® starts with the camera inspection and the insertion of plugs inside the service connections.

The plugs are inserted in the service connections to prevent the migration of epoxy resin into the service line and potentially fowling the corporation stop.

As the service connections are plugged, a video inspection of the line is carried out. Each service connection is located and compiled in a log to be used at the end of the rehabilitation process when these same service connections have to be opened (see Section 2.8).

Finally, the video inspection allows the technicians to check for any leaking service connection and provide the client with a preconstruction video.



Figure 11: Control Panel for CCTV Inspection



Figure 12: Plugging Service Connections

## 2.6 Impregnation, Insertion and Curing

Lining involves three main activities: impregnation of the liner; insertion in the host pipe and curing the liner inside the host pipe.

AQUA-PIPE® is made of 2 circular woven (seamless) polyester jackets with a watertight polymeric membrane fused to the inner jacket.

The idea is to have an absorbent fibrous matrix (polyester) that will allow the epoxy to penetrate the material and harden in place. The combined effect of polyester with a hardened epoxy makes the composite liner. The mechanical properties of the resulting composite liner will exceed the requirements of ASTM F1216.

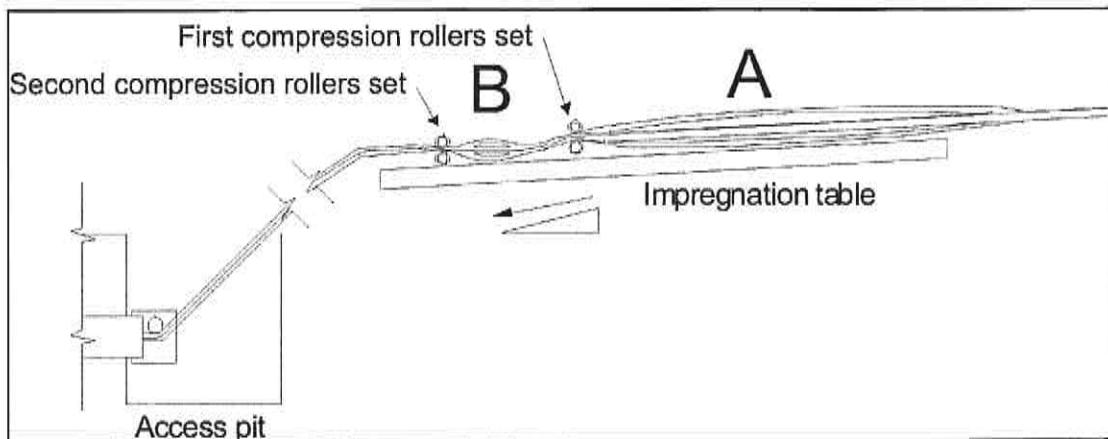


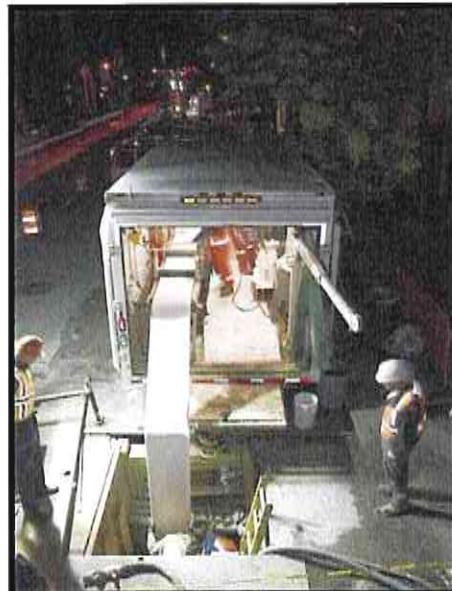
Figure 13: Arrangement of Impregnation Table

The impregnation of the material (or wet out) is achieved on-site in a refrigerated environment. The low temperature delays the reaction of the two parts that ensure the adhesion. The AQUA-PIPE® liner is impregnated with a two part epoxy system. Figure 14 shows the table arrangement for the impregnation process.



**Figure 14: Impregnation of the jacket**

The AQUA-PIPE® liner is pulled inside the host pipe with the help of a winch at the receiving access pit. Pulling can be performed in small spaces. The impregnation and pulling actions are carried out simultaneously (see Figures 15 and 16).



**Figure 15: Insertion of the liner**



Figure 16: Insertion of the liner

Once pulled in place, the liner rests flat inside the host pipe and needs to be formed or inflated (see Figure 17). The liner is pushed against the inside walls of the host pipe with the help of a swab (pig) and water pressure.

In the process, any trapped air located between the liner and the pipe is evacuated and all voids and cracks are filled with epoxy. These actions allow the liner to fit tightly against the inside walls of the existing pipe and provide a watertight environment after the liner has cured.

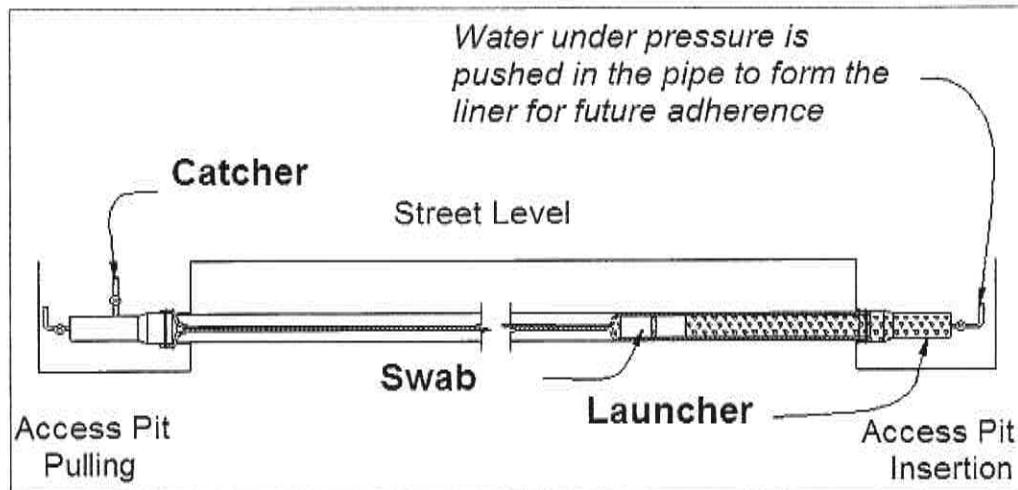


Figure 17: Pulling and forming process

Curing involves heating the impregnated liner to initiate a reaction between the components of the polymeric resin. The reaction will cause the polymeric resin to reticulate and harden to confer mechanical rigidity to the liner. Heat is supplied and transported by water.

At the end of these three steps (total time of approximately 16 hours), the liner has become a solid structural pipe, inside the host pipe.



Figure 18: Curing with hot water

## 2.7 Hydrostatic Pressure Test

If required by the owner, the water main will be subjected to a hydrostatic pressure test before the reinstatement of the service connections. The pressure test and the allowable leakage will be carried out as indicated in the contract specification.

## 2.8 Opening of the Service Connections

The AQUA-PIPE® trenchless technology allows for the services to be robotically reinstated from the inside of the renewed pipe. A remote controlled robot is used to open the service connections.

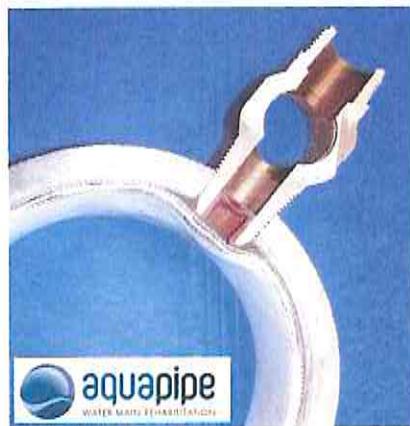
The remote controlled robot is water tolerant and small enough to fit in a 6 inch diameter pipe and still allow for the freedom of movement necessary to reach and penetrate the service connection. (see Figure 20).

Equipment to reinstate service connections is combined with video viewing and recording equipment for final inspection of the re-lined water main.



**Figure 20: Opening of the service connections**

The reinstatement of the service connections does not affect water tightness. In fact, water tightness is maintained by the epoxy which fills all voids around the threads of the service connection (see Figure 21).



**Figure 21: Water Tightness at the Service Connection**

## 2.9 Fitting Installation and Civil Works

Following the reinstatement of all service connections, the required fittings and accessories are installed in the access pits and the rehabilitated pipe is rinsed, disinfected and returned to service. Figure 22 shows a typical re-connection in an access pit. Regular pipe and fittings readily available in the market place and as specified by the utility are used for these connections to the rehabilitated pipe.



**Figure 22: Typical Reconnection in an Insertion Pit**

Most utility owners will take advantage of the rehabilitation work and replace the old valves and hydrants. In addition, valves and hydrants may be installed or abandoned because of changes in the codes and regulations. The replacement and addition of new valves and hydrants are carried out through local excavations which, when possible, are used as access pits.

Furthermore, restoration of the roadway infrastructure is done after the rehabilitation in order to leave the environment as it was before the work began. Restoration involves pavement, curbs, sidewalks and any other infrastructure that was removed to access the water main.

## **2.10 Future Maintenance, Tapping and Connections**

The new lining will not require maintenance once it has been installed into the old pipe. The corrosion free lining will not allow deposits to attach or form on the inside wall of the pipe.

The new lining can be dry or pressure tapped. The only precaution would be to make sure that the utility workers use a saddle or tapping sleeve and a sharp shell cutter, and make sure that they have cut through the walls of both the existing pipe and the liner.

If a cut has to be performed on a section of rehabilitated pipe, the same procedure as regular pipe can be used. The pipe should be cut with a circular saw equipped with a sharp diamond blade, removed and replaced with a new section of pipe and fittings along with a coupling. No special end seals are required at the pipe extremities. Written procedures are available for these operations and are submitted as part of the work report for an AQUA-PIPE® project.



**Figure 23: Typical Pressure Tap**



**Figure 24: Typical Pipe Cut**



# Certificates

# NSF International

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VARENNE, QUEBEC, CANADA

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David Purkiss, General Manager  
Water Distribution Systems

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April 13, 2005  
Certificate# 0L190 - 01

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A handwritten signature in black ink that reads "David Purkiss".

April 13, 2005  
Certificate# 0L192 - 01

David Purkiss, General Manager  
Water Distribution Systems



# Articles / Case Studies



**Paper E-3-01**

## **TRENCHLESS RENEWAL OF WATER MAINS BENEFICIAL TO BOTH THE EXISTING WATER MAIN AND THE ASPHALT PAVEMENT**

Anna Polito, Eng.<sup>1</sup>, and Joseph Loiacono, Eng.<sup>2</sup>

<sup>1</sup> Urban Planning and Engineering Department, City of Dollard-des-Ormeaux, Quebec, Canada

<sup>2</sup> Sanexen Environmental Services Inc., Varennes, Quebec, Canada

### **ABSTRACT**

How many times have we witnessed a newly installed street pavement be prematurely excavated to repair an unforeseen water main break? Why do road crews wait over a year before installing the final asphalt layer on the roadway after a new water main installation? Should trenchless technologies be preferred over open cut replacement to increase life expectancy of the new pavement? Is public perception and political responsibility important to the utility manager? These issues and questions are often used in the decision process to choose the best method to either replace or renew a deteriorated water main while at the same time considering the life cycle of the roadway.

Like many North American cities, the city of Dollard des Ormeaux has completed and put in place an Asset Management Program for its water, sewer and roads infrastructures. This Program allows the Engineering Department to target the water mains that need to be renewed and the streets that need repaving. For the latter case, the ensuing inspection of the water and sewer infrastructures under these streets has led to the structural renewal of the water mains under them.

Today, many water utilities work closely with city road departments to efficiently schedule their construction work and to achieve the best design possible for both the water main and the new pavement. For the past ten years, the City of Dollard des Ormeaux has been using structural cured in place liners to renew their water mains and has constantly saved money therefore optimizing each dollar spent on infrastructure renewal. This paper will present, with the help of examples, the decision criteria used by the City of Dollard des Ormeaux to choose and prioritize the renewal of their water mains and also discuss how sidewalk and street paving considerations often impact their water main renewal priorities.

### **1. INTRODUCTION**

The City of Dollard-des-Ormeaux is a west island suburb located on the island of Montreal, Quebec, Canada. The city, founded in 1960, and with a population of approximately 50,000 residents, owns and manages approximately 122 miles each of water, sanitary and storm mains as well as approximately 115 miles of road infrastructure. The majority of the water mains that have been installed were made of unlined cast and ductile iron pipes ranging in diameters from 4 to 24 inches. In the mid nineties, like many other cities in North America, the city's water system was slowly deteriorating. An analysis of the city's database revealed that 91 % of the water main breaks in the last

10 years occurred on water mains installed between 1959 and 1972. As a result, city managers had to deal with many water main breaks and leaks along with red water and water flow complaints.

## 2. METHODOLOGY

Until 2004, work on the water distribution network was carried out to resolve the system's hot spots. For example, from 1996 to 1999, water mains with chronic red water problems were rehabilitated using non structural epoxy lining.

As of the year 2000, the city started lining its water mains with structural cured in place pipe (CIPP). At the time, water mains were prioritized to be rehabilitated by using the break history criteria. Since 1996, the City has rehabilitated or renewed over 31% or 39 miles of its water mains of which 23 miles were rehabilitated with structural CIPP, 11 miles with non structural cement mortar and epoxy linings and 5 miles were replaced (Figure 1).

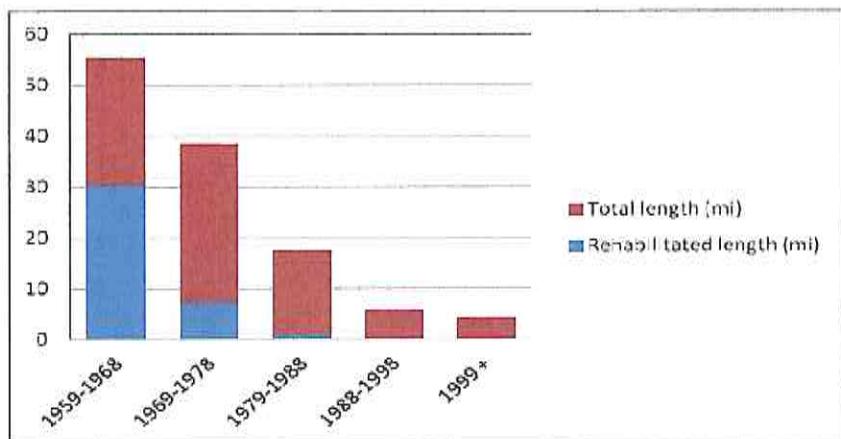
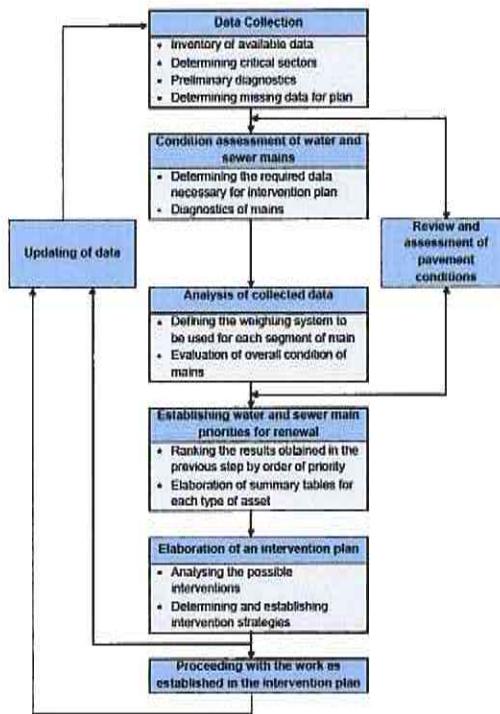


Figure 1: Total length installed versus total rehabilitated length

In 2004, the City started its integrated asset management program allowing it to put together a master plan which indicated the short and long term work priorities for the city's water mains, sanitary and storm sewer mains as well as its road infrastructure. This plan was created based on the *Quebec Ministry of Municipal Affairs, Regions and Land Occupancy's* guide for elaborating a master plan for the renewal of water and sewer mains (Figure 2).

The weighted average of several criteria was used to establish the order of its interventions. For example, for each segment of water main the following information was gathered and weighted to establish the priority of interventions: the number of water main breaks (last 5 years); water quality (colored water); static and dynamic water pressures; condition assessment results (internal and external corrosion); resident complaints and street classification (boulevard, collector or local street). A similar exercise was used to establish the priorities for sanitary and storm sewers and for establishing street reconstruction priorities. Based on the priorities, the subsurface utilities are either rehabilitated or replaced. It should be noted that only after the subsurface utilities have been renewed or show no signs of significant degradation does the city proceed with road reconstruction, if warranted.

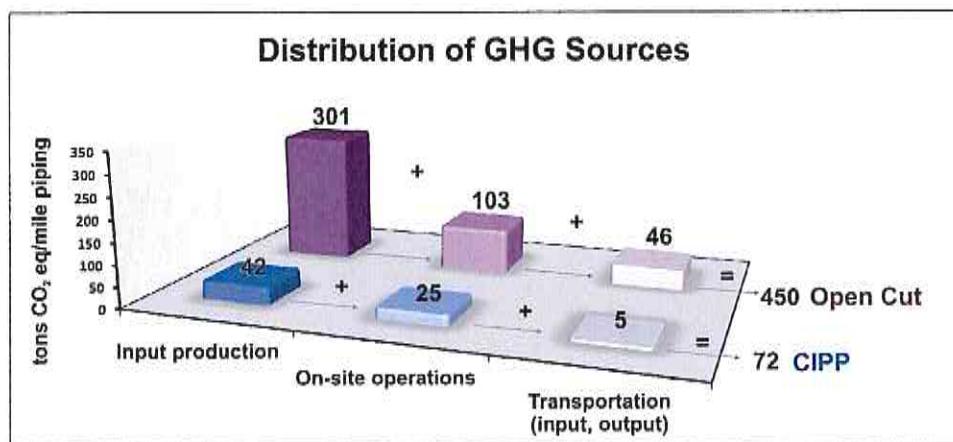


**Figure 2 : Methodology used to create intervention plan**

### 3. REPLACEMENT OR REHABILITATION OF WATER MAINS

The choice to structurally rehabilitate, replace or cathodically protect a water main is determined by the condition of the pipe and the pavement. If the water main assessment indicates that the main is at an advanced stage of deterioration, it is the city's policy to recommend rehabilitation using a structural cured-in-place pipe (CIPP) over the conventional open cut method. CIPP provides many advantages to the city including: short construction time; reduced construction costs; minimal excavations; minimal pavement settlement at pit locations; reduced disruptions to residents and traffic.

Furthermore, structural rehabilitation of water mains produces 84% less green house gases (GHG) than the conventional open cut method. Figure 3 shows, for a specific CIPP manufacturer, the quantity of GHG emissions for the renewal of small diameter pipes (6-12 in.) for both CIPP and the conventional open cut method. A rigorous quantification protocol was used to calculate emissions from the following GHG Sources: material production, on-site operations and transportation.



**Figure 3: Distribution of GHG Sources**

The GHG emission reductions for a water main rehabilitated using CIPP would be even greater if the indirect reductions associated with traffic detours were quantified.

The recommendation to proceed with a pipe replacement is only considered if the size of the water main needs to be increased to improve its hydraulic properties, other utilities also need to be replaced or the main needs to be relocated.

Due to our geographic location, climate constraints also influence the choice of the rehabilitation method. In winter, climatic conditions in Quebec are particularly harsh and depending on the region, the ground freezes to a depth varying from 4 to 10 ft for a period of more than four months. Combined with the temperature fluctuations and humidity levels, this has a considerable impact on pavement performance. Therefore, for the period from November 15<sup>th</sup> to March 15<sup>th</sup>, only local repairs are carried out due to high construction costs attributed to winter conditions. From mid-March to mid-May, the annual spring thaw period also limits the amount of construction work that can be carried out. During this period, the road composition is weakened by water accumulation; therefore to protect the road network, provincial legislation limits vehicle loading to take into account the weaker load bearing capacity of the roads. Consequently, most of the planned construction work is carried out in the five month window from mid-May to late October.



**Figure 4: Paving after CIPP rehabilitation**

Also, studies have shown that utility cuts on road pavements can reduce the life span of the pavement between 30 and 50 %. In order to minimize pavement settlement and cracking, cities typically wait one full year before applying the final asphalt coat. So using the low dig or trenchless technologies to renew the subsurface utilities allows for much less disruption to the road infrastructure and provides the city with the option of paving the streets during the same year. Figure 4 shows a road repair subsequent to a CIPP access pit excavation. The access pit was backfilled with non shrink concrete and as a result this method produced almost no settlement. Consequently, the asphalt repair remains in good condition for years thus prolonging the life of the street pavement.

#### 4. RESULTS AFTER A 10 YEAR REHABILITATION PROGRAM

After 10 years of water main renewal with structural CIPP liners, the City of Dollard-des-Ormeaux has reduced its annual break rate by 65%. In 2000, the city experienced 65 breaks per 100 miles of pipe while in 2010, this figure decreased to 22 breaks per 100 miles. In addition, the city has not experienced any breaks on rehabilitated water mains. This has also had a significant impact in resolving colored water and reduced pressure problems. Figure 5 shows the annual water main breaks registered for the entire water distribution network since the year 2000.

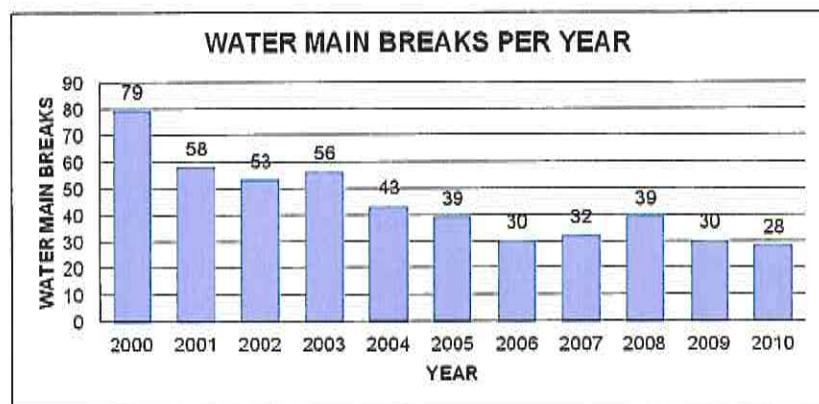
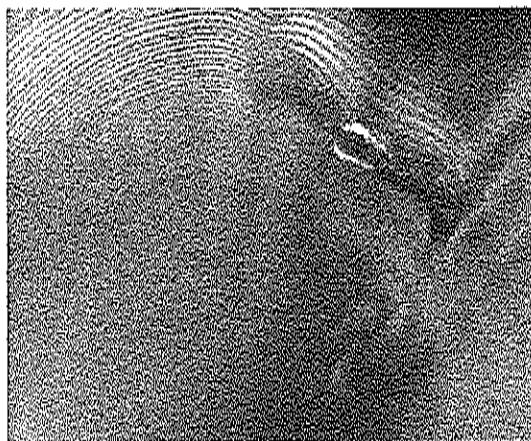


Figure 5: Water main breaks per year for entire network

In 2011, the City agreed to participate in a pilot project with the *Center for Expertise and Research for Infrastructures in Urban Areas* (CERIU) to monitor the performance of the first mains, in the Province of Quebec, that had been renewed using trenchless technologies. A condition assessment was carried out on a water main that had been structurally rehabilitated in 2001. This assessment was carried out using the Investigator™ technology, by Wachs Water Systems, which operates in a pressurized water main and provides high quality CCTV visuals, precise acoustic leak detection and advanced tracking/mapping capabilities. The results of the water main condition assessment at this test site revealed that the liner is still in excellent condition, shows no signs of failure and no leaks were detected on the water main nor on the service connections (Figure 6). More random verifications will be done to continue monitoring the performance of rehabilitated water mains.



**Figure 6: Pipe condition (rehabilitated in 2001)**

## 5. CONCLUSION

For the past ten years, the Municipal Council of the City of Dollard-des-Ormeaux adopted a proactive approach regarding the annual investment for the renewal of its underground utilities. The City has been using structural cured in place liners to renew its water mains and has constantly saved money therefore optimizing each dollar spent on infrastructure renewal. On average, the City saves 40% in direct costs by using CIPP compared to the full replacement of the main. Furthermore, using cured in place pipe (CIPP) to renew its water and sewer mains not only improves the stability and quality of the networks but also promotes sustainable development by the reduction of green house gases produced during construction by more than 84% in comparison to using the traditional open cut replacement option. Finally, by rehabilitating the mains by using the CIPP method, this shortens the work time, considerably reduces the risks of damaging other underground utilities, no street closures are required and the citizens are not inconvenienced as much as they would be if the traditional open cut method were used.

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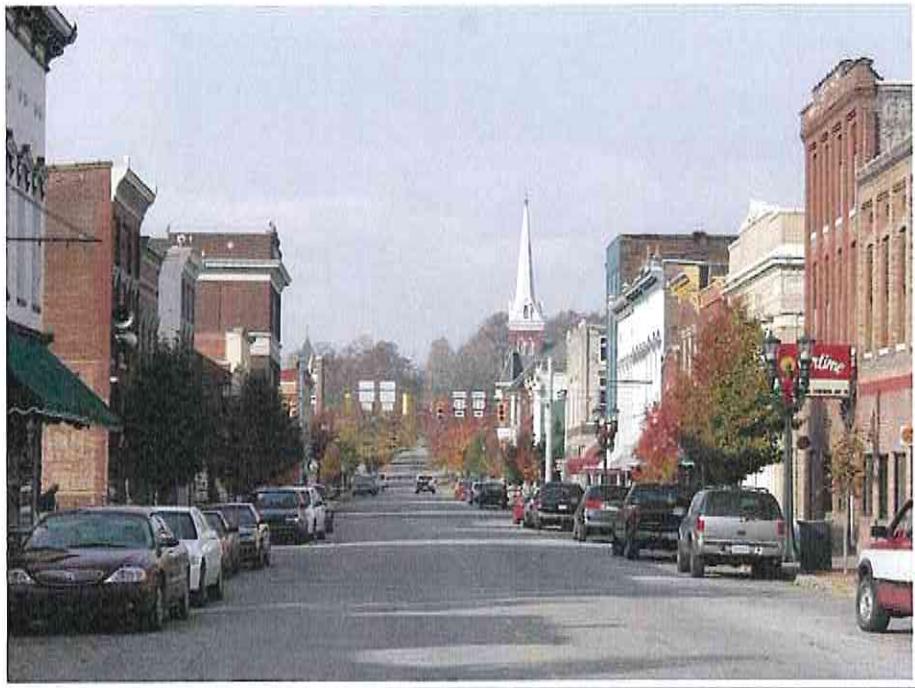
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## Huntingburg, Ind. Tackles Water Issues in Downtown District

BY MIKE KEZDI ON MARCH 2, 2017

APPLICATIONS, FEATURES, PIPE RELINING, REHABILITATION, UNITED STATES



### Stellar City Tries Trenchless

When the downtown district of Huntingburg, Indiana - the city you lead - is known for its unique shops and restaurants and looks like it could be a Hollywood movie set for Midwestville, USA, planning an open-cut construction project for water main work just won't do.

That's what the leadership of **Huntingburg, Indiana** - a city of approximately 6,000 residents in the southwestern corner of the state - faced when it came time to rehab the more than 120-year-old cast iron water main along East 4th Street. The project, long on the City's wish list, came to the forefront when Huntingburg received Stellar Community status in 2014 from the Indiana Lieutenant Governor's office.

The Indiana Sellar Communities Program is a multi-year, more than \$58 million (investments to date) initiative that develops strategic community investment plans, promotes partnerships and implements comprehensive solutions to address local challenges in Indiana's smaller communities involving community economic development, housing, transportation and overall quality of life.

"This designation provides the investment and technical assistance to fast-track nine individual projects over a four-year construction window. The projects total over \$42 million and are funded through the state grants and strategic private partnerships," says Jon Craig, client administrator, **Midwestern Engineers Inc.** "This level of investment is transformational in a community of 6,042 residents and creates a platform for increased private investments in the city."

Huntingburg received its designation in 2014 and with the funding city leaders plan to enhance the downtown area via a streetscape. Knowing full well that the water main below the street needed work the time for repairs was now.

"The streetscape project gave us, for lack of a better term, the political will to move forward and say we have to do this now. Once we got the Sellar Community designation, we knew we couldn't throw good money after bad," says Mayor Denny Spinner. "We did not want to put new streetscape on top of a water line that was prone to failure. We wanted to make sure we had secure infrastructure underground before the streetscape commenced."

The superintendent of the City's water department was aware of trenchless rehabilitation techniques and city leadership tasked him with conducting all of the research to find out the pros and cons of this new (to the city) method for pipe repair. Spinner says when they were presented with the options, it was clear that trenchless was the way to go.

Reasons for going trenchless include moving the project along at a faster pace, not having a complete interruption of service and not impeding foot and vehicle traffic downtown.

"We wanted to maintain the integrity of what we have downtown because that is why people come to Huntingburg, so doing it with minimal disruptions was the goal," Spinner says.

## Condition Assessment

City leaders knew for years that the section of water main was a problem. There had been frequent breaks requiring patchwork repairs and there were pressure concerns not only to the businesses but for firefighting, as well.

According to Craig, for a 120-year-old water line, the structural integrity of the iron pipe was actually good. Much of the City's problems were with the corporation stops blowing out of the pipe on a regular basis. The pressure concerns were a direct result of tuberculation, greatly reducing the capacity of the system in the project area.



*The Huntingburg, Indiana pipe relining project was in the heart of its historic downtown.*



*Tuberculation in the existing water pipe led to decreased water pressure along 4th street.*

## Scope of Work

After making the determination that trenchless was the way to go, the City worked with Midwestern Engineers to design and manage the project, vet contractors and also work with them on the public information end. Based in Indiana, Midwestern Engineers is a 58-year-old firm that is no stranger to water and wastewater construction projects. It is also familiar with trenchless rehabilitation on the wastewater side, but the Huntingburg project marked its first foray into trenchless relining for a water distribution system.

"While lining projects are standard practice for sewer systems throughout Indiana, this was the first use of CIPP technology in a water distribution system (that was not a transmission main) in Southern Indiana," Craig says. "As the project moved forward numerous utilities, state agencies and industry professionals closely observed the project due to its uniqueness for the region."

Midwestern Engineers determined that a structural cured-in-place pipe (CIPP) liner would be best suited for the project along East 4th Street. The City was confident enough in the process that it added Jackson Street, an adjacent residential thoroughfare, to the project.

Fer-Pal Construction USA, of Taylor, Mich., an AquaPipe licensee, was contracted to reline more than 1,580 ft of 8-in. and more than 940 ft of 6-in. cast iron mains.

"AquaPipe demonstrated that their product would perform and work for the City," says Richard A. Burch, P.E., director of engineering at Midwestern Engineers. "Similar projects were reviewed and a site visit was made in Northern Illinois to evaluate the product and the installation of the liner."

Not only did Fer-Pal install the AquaPipe liner, the contractor handled bypassing for the project to ensure limited disturbance to 27 residential connections on Jackson Street and 80 commercial connections on East 4th Street. Fer-Pal also tied the line into the distribution system, which required the installation of 23 inserting valves and 31 gate valves ranging in size from 4 to 12 in. Crews also replaced hydrant legs with new tees and sleeves to connect to the existing mains.

"Each project is unique in its own way. Temporary water service required multiple lines, one on each side of the street. Lining of a wastewater main would require only one line for bypass pumping of sewage," Burch says. "Excavation of multiple access points, approximately every 400 ft, was required for the installation of the water pipe lining."

The City stipulated that the project start after the Garden Gate Festival held at the end of April and be complete before the Huntingburg Christmas Stroll, which kicks off the holiday shopping season in November. "The time factor was a critical point of consideration because we did not want to interrupt either event," Spinner says.

The project - from beginning to end - took approximately three months and was complete by June 28, 2016. According to the Mayor, traditional methods the City reviewed were estimated at four to six months barring any unforeseen circumstances below ground. One such circumstance did crop up when crews discovered an unmarked storm sewer on the first day of construction, but it was quickly handled and did not delay the process.



A Fer-Pal USA worker installs the AquaPipe liner in Huntingburg, Indiana.

## Communicating with Residents, Businesses

In addition to the tight timelines, the City made it clear to Midwestern Engineers and Fer-Pal that the project required a thorough communications plan. These included meetings before construction began and 48-hours notice of any closures, so businesses could properly notify customers. News releases with graphics were routinely distributed with project info and traffic pattern changes. Regional print and television media provided coverage of the project.

On the City's end, it worked with the Chamber of Commerce and the Huntingburg Merchants Association on a promotion that encouraged shoppers to continue to visit the retail corridor during construction. This was possible because of the location of the main is solely under one lane of the east-west street. This allowed traffic to be maintained in one direction for the majority of the work.

Spinner says that when people asked why the City was doing the work, he gladly showed them photos of the 120-year-old pipe and they quickly understood.

"From the City's side of things, it was trying something new that had never been done in our area and we took a roll of the dice in doing that, but with our engineer and all of our investigation prior to it, we felt very confident going into it," Spinner says. "With a minor snag or two along the way, the project went as well as we could have hoped. It also proved this is a technology that we will continue to explore. It's not the right technology for every replacement project, but there will certainly be areas in our community where it will be the right approach. We are happy to have it in our portfolio."

It did not take long for Huntingburg to jump back into the fray as city leaders and Midwestern Engineers have a request for proposals out to reline the same vintage pipe along a two-block section of U.S. Route 231 the main north-south route through the heart of the City.



*The bypass system for the Huntingburg, Indiana relining project.*

Mike Kezdi is associate editor of *Trenchless Technology*.

## 2016 Water Main Rehabilitation

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### 2016 Water Main Rehabilitation Short Elliott Hendrickson Inc.

Client: City of Wauwatosa Water Utility Category: Special Projects

Location: Wauwatosa, WI

Municipalities are always trying to innovate and the city of Wauwatosa is no exception. The final product of a multi-year and multi-million dollar renovation of the downtown is anticipated to draw in more visitors and businesses than ever before. But while those plans wonderful, there is a lot of infrastructure work that needs to take place first. This is where the city ran into trouble - a water main 1897. This main had to be rehabilitated before any future plans moved forward.

Short Elliott Hendrickson (SEH) stepped up with an innovative use of trenchless technology that kept disruption to a minimum. The technology is designed to review underground assets without the need to dig a trench to get at the pipes. These trenches are disruptive and expensive; in Wauwatosa's case, the water main ran underneath a bike path, a railroad and multiple businesses and restaurants. To compound the issue, there were no as-built drawings on record because of the age of the pipe.

SEH was able to work closely with Wauwatosa Water Utility staff to perform a live water main and leak assessment using a camera sent in through a fire hydrant. Using data gathered from the camera, SEH designed a pipe liner that will last for another 70 years, meaning that this water main could be a part of Wauwatosa's infrastructure from 1897-2087.

As awards judge Angela Hanz, PE explains: "This project was unique in that a vintage 1897 water main could be rehabilitated using trenchless technology rather than being replaced with a new pipe. This resulted in minimal disruptions to downtown businesses in Wauwatosa's busiest area of the community and a quick project completion."

Through careful cooperation and foresight, SEH's team was able to deliver an optimal solution as part of a major municipal effort. Wauwatosans were able to directly benefit from the lack of disruption and quick project completion and will be able to benefit from a rehabbed 19th century pipe and a 21st century downtown.



#### Location

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# Trenchless TECHNOLOGY™

## Addressing Aging Water Infrastructure

Pilot Project in Cleveland Evaluates Structural CIPP for Water Mains

By Jim Rush

**A**bout once a minute somewhere in the United States, there is a water main break. That means by the time you finish reading this article, thousands of gallons of our most precious resource will be lost through aging pipe networks. In severe cases, water main breaks can cause major damage and impact safety, while in more routine instances customers are left without service.

According to the U.S. Environmental Protection Agency (EPA), there are 240,000 water main breaks per year, and the break rates increase substantially as a system nears the end of its useful life. And as our buried pipelines continue to age, we can expect to see this number increase unless additional efforts are made for their renewal.

With this in mind, EPA's Office of Research and Development initiated an Aging Water Infrastructure Research Program, which includes field demonstrations of emerging technology in collaboration with water and wastewater utilities. The purpose of the program is to gather reliable performance and cost data to enhance the use of existing or emerging technologies that may be beneficial yet under-used. Cost-effective and high-performing technologies allow utilities to make the best use of their resources and thus help stave off the effects of aging water infrastructure.

One component of the research program is a study on "Rehabilitation of Wastewater Collection and Water

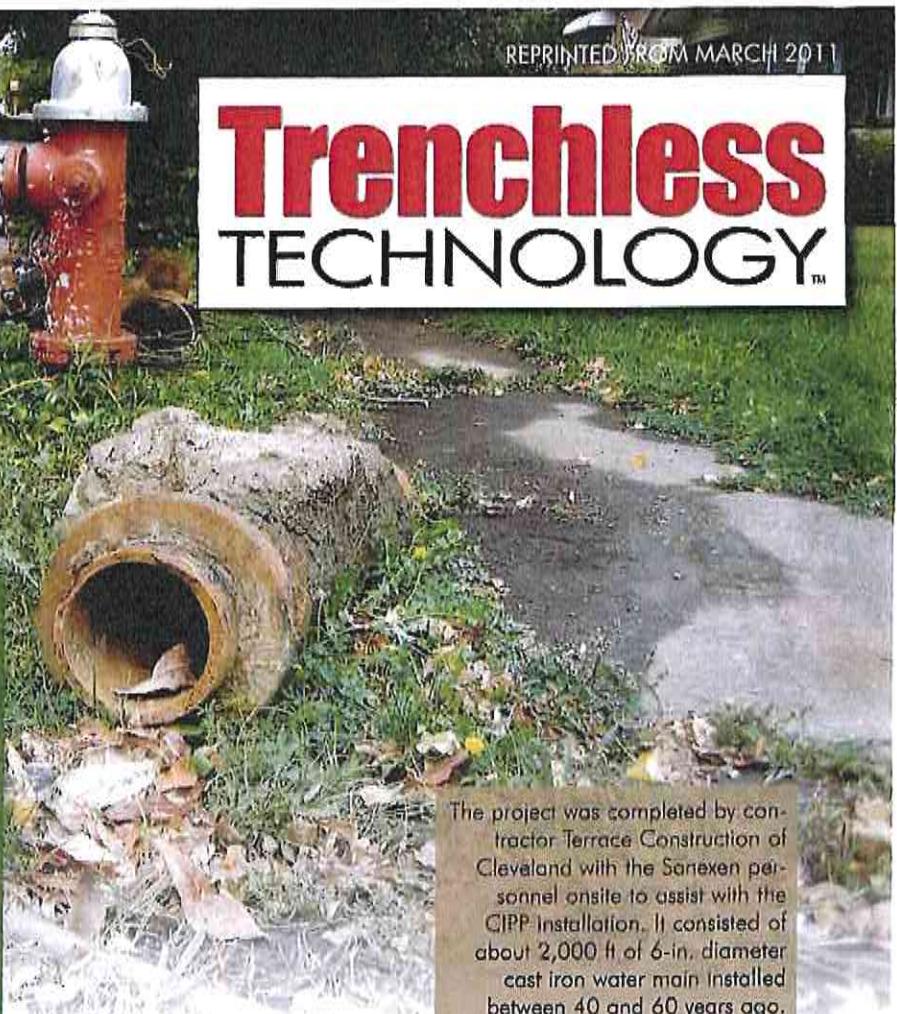
Distribution Systems." Independent research and development firm Battelle was commissioned to write the report with input from the Trenchless Technology Center at Louisiana Tech University, Jason Consultants and ALSA Tech.

As part of the project, EPA and the City of Cleveland, Ohio, collaborated on a pilot project that examined the use of CIPP for water mains. "What we wanted to do is demonstrate the cost and effectiveness of existing and emerging rehabilitation technologies," said Dr. Ariamalar Selvakumar, environmental engineer and EPA Task Order Manager for the field demonstration project. "We concentrated on drinking water rehabilitation because there are not as many technologies being used in that area."

EPA surveyed existing technologies and worked with interested vendors in selecting the processes to be used for field demonstration. For the Cleveland field demonstration project, the Aqua-Pipe product from Sanexen Environmental Services Inc. was selected.

### About Aqua-Pipe

Aqua-Pipe is a structural cured-in-place pipe (CIPP) liner developed for the drinking water industry by Sanexen Environmental Services, based in Montreal. The product was designed to meet ASTM F1216 and F1743 guidelines for the rehabilitation of water mains and certified to NSF/ANSI Standard 61.



The project was completed by contractor Terrace Construction of Cleveland with the Sanexen personnel onsite to assist with the CIPP installation. It consisted of about 2,000 ft of 6-in. diameter cast iron water main installed between 40 and 60 years ago.

The product was developed in the 1990s and has been used to line more than 1 million ft of pipe in the United States and Canada. The liner is composed of a two-jacket, polyester-woven jacket that is winched into place. The inner jacket contains a polymeric inner membrane to keep it watertight.

To install the liner, a temporary bypass system must be set up to keep water service in operation during the lining process. Access pits are then installed and the existing pipe cleaned and prepped for liner installation.

Before the installation, the pipe is inspected by CCTV cameras and service connections are plugged using robotic equipment to prevent resin from setting within the connection. Once this work is complete, the resin-impregnated liner is ready to be pulled into position and cured with hot water. The water activates the thermo-setting resins, which form a structural liner within the pipe.

After curing, the liner is undergoes hydrostatic pressure testing before service connections are reinstated robotically. The line is then disinfected and re-connected to the water system.

The product is used for water mains in diameters ranging from 6 to 12 in., and in lengths up to 500 ft.

### Field Demonstration

The City of Cleveland Division of Water has historically approached water main renewal in two ways. Most common for areas with high break rates, thus needing a structural solution, dig-and-replace is most common. In areas where the pipe is structurally sound on the outside but suffering from tuberculation on the side, cleaning and cement mortar lining is common.

For the Cleveland field demonstration, a section of pipe was chosen along Ferncliffe Ave., a residential area near Cleveland Hopkins Airport. "For our pilot project we were looking for an area that had a high break rate that needed a structural solution, but we also wanted a street that wasn't industrial or commercial," said Alex Margevicius, assistant commissioner of the Division of Water. "We were already doing other work in the area, so Ferncliffe Avenue emerged as a good candidate to pilot this technology."

The project was completed by contractor Terrace Construction of Cleveland, with the Sanexen personnel onsite to assist with the CIPP installation. It consisted of about 2,000 ft of 6-in. diameter cast iron water main installed between 40 and 60 years ago. The project area ran from W. 190th Street in the west to Rocky River Drive in the east.

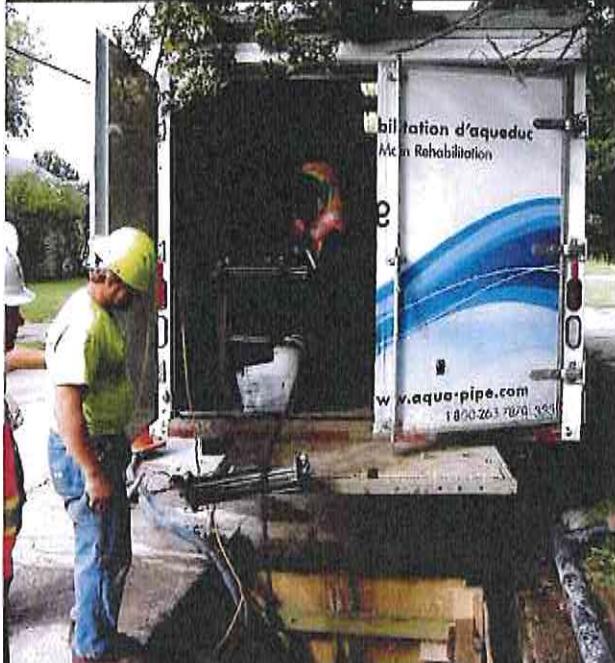
Margevicius said that the Division of Water had been looking for less disruptive alternatives to dig-and-replace. "Open trench is extremely painful to residents, to customers, to the commuting traffic out there," he said. "With dig-and-replace, you've got a 6-ft wide trench. You've got dirt everywhere. It's messy. It's inconvenient. We wanted to find something else."

After talking with Sanexen representatives and reviewing the product, the Division decided to proceed with the pilot project, which was completed in August and September 2010.

### Looking Ahead

The rehabilitation market for drinking water pipe has lagged behind sewer pipe, so a great demand exists in the market. Sanexen general manager Sylvain Boissonneault says that he sees more activity emerging in the drinking water sector. "Because we are dealing with potable water, it took longer to

EPA and the City of Cleveland, Ohio, collaborated on a pilot project that examined the use of CIPP for water mains using the Aqua-Pipe product from Sanexen Environmental Services Inc.



develop a suitable product," he said. But now we are catching up. We see the water market growing really fast."

Margevicius said that while testing needs to be completed, he is pleased with the initial results and that the Division of Water would be open to using CIPP for water mains in the future. He said that a large factor in the decision to use CIPP vs. dig-and-replace would likely be cost. "We have hope that in the future as the CIPP technology for drinking water pipes becomes more used and contractors become more familiar and comfortable with it, that the price will come down and become more cost-competitive with replacement," he said.

For Selvakumar, the hope is that more and more cities will be amenable to using new technologies in addressing their infrastructure renewal as more information becomes available. "By doing these projects and making the reports available, other cities can see the cost and effectiveness of these processes," she said. "Many times, municipalities will not try something unless they see it done somewhere else."

The "Rehabilitation of Wastewater Collection and Water Distribution Systems" report is in progress and is expected to be available this summer.

Jim Rush is editor of *Trenchless Technology*.



**Toll free:** 1800-263-7870

a technology developed by: **SANEXEN**  
ENVIRONMENTAL SERVICES INC.

# Bright Lights

of Madison Avenue  
Shine on Trenchless  
Rehab Project

By Benoit Cote

The Madison Avenue relining project was completed at night to minimize disruption to businesses and residents.

**Y**es, it's *that* Madison Avenue — and the new trenchless technology worked better than claimed and did everything promised, plus a whole lot more.

This Mad Ave story is about a pilot project on, or more specifically, beneath, the famed thoroughfare in New York City and spotlights a successful pilot project to rehabilitate a decaying drinking water pipeline. Interestingly, part of the rehabilitation utilized a structural trenchless technology exclusively for drinking water distribution systems. The technology was developed by the Aqua-Pipe division of Sanexen Environmental Services. More than 1.2 million ft of Aqua-Pipe has been installed throughout North America.

The successful outcome from this project now has officials at the NYC Department of Design and Construction (DDC) impressed enough to try it again, this time on a full-scale basis.

The saga began many years ago when officials at DDC put out a request for bids to repair deteriorating water mains along Madison Avenue. The original 48-in. cast iron pipe, some 9,000 ft, was installed back in the late 1800s. The project was awarded to Haleyon Construction Corp., Pleasantville, N.Y., which had the lowest bid. The firm is a multi-million dollar corporation that specializes in solutions for the water, sewer, pipeline,

## Trenchless TECHNOLOGY™



communications and power line construction industries.

According to Purnima Dharia, director of Design Section 3 for the Infrastructure Division at DDC, three solutions were to be completed by the contractor and were part of the original contract documents with plans, specifications and design by DDC. Two of the three solutions have been implemented. The first was lining the larger 48-in. cast iron pipe with HDPE; the second, a significantly shorter and 12-in. diameter section, utilized an Aqua-Pipe structural liner as a pilot project to test the potential of this new technology. The third approach — pipe bursting — has not yet been undertaken.

"The technologies were pre-approved by the New York Department of Environmental Protection (DEP), but had never been tried here in New York," Dharia said.

While the contractor inserted the HDPE lining into the larger 48-in. diameter pipe sections along the avenue, crews also inserted and formed an Aqua-Pipe structural liner as a test, covering a one-block section (on Madison Avenue in the 60s) that had only a 12-in. diameter main. There was no controversy in that the liner has mechanical properties that exceed all specifications and meet drinking water requirements throughout the Americas (certified by NSF to standard NSF/ANSI 61).

## Criteria of New York City

The reasons for trying this approach with the Aqua-Pipe ran deeper. Sal Leopoldo, project manager for Halcyon Construction Corp., noted that the needs of the City and the promise of the technology included:

- Little excavation compared to open-cut rehabilitation — a small access pit was excavated at each end of the section.
- Quick repair to reduce complaints by residents and minimize traffic disruption (work was performed over three nights — one to clean the existing pipe, one to line and cure the new liner, and one to test the system and close the small access pits).
- Once installed, no future maintenance would be required.
- The possibility to line through bends (not needed in this application).
- Adjacent infrastructures would not be disturbed by the work.
- New materials could handle increased pressure and flow capacity and be corrosion resistant.
- Regain structural capacity of the pipe.
- Reduced costs as compared to open-cut technologies.
- Low emissions of carbon dioxide when compared to traditional construction methods.

"Our experience with the Aqua-Pipe structural liner system enabled us to be confident enough to convince city officials that better water pipe rehabilitation approaches were available," Leopoldo said.

The project was completed by a combined team of the contractor and Sanexen Aqua-Pipe personnel comprising a crew of four, plus a foreman. Project steps included:

1. Installing a temporary bypass while the work was being done.
2. Evacuating access pits at each end of the three-block section.
3. Cleaning pipe with a metal chain reamer.
4. Conducting a closed-circuit television (CCTV) inspection to chain the service connections.
5. Using specialized robotic equipment to insert a plug in every service connection from inside the pipe.
6. Impregnating the liner onsite in a trailer truck by injecting the epoxy between the two layers of liner while pulling the liner in place (with a pig).
7. Forming the liner by sending swabs from one end to the other.
8. Curing the liner by circulating hot water.
9. Performing a hydrostatic pressure test.
10. Reinstating service connections with specialized robotic equipment.
11. Disinfecting the pipe.
12. Reconnecting the water distribution system.
13. Removing the temporary bypass, and finally,
14. Restoring the site.

The installation of the Aqua-Pipe liner and reinstatement of the water flow only took three days or more specifically, three nights.

While technology of this type was once only applicable for gas and sewer rehabilitation projects, new materials make it possible to restore water mains. The composites used — a woven polyester jacket with a polymeric membrane that is bonded to the interior with a special epoxy resin — achieve the desired results. It is a standalone structural liner than can withstand all dead and live loads. Additionally, it can withstand internal operating pressures of up to 150 lbs, including vacuum, without the help of the residual strength of the existing pipe.

Benoit Cote is vice president at Aqua-Pipe, a division of Sanexen Environmental Services, Varennes, Quebec, Canada.

**The American Society of Civil Engineers (ASCE) estimates that 6 billion gal of treated potable water are lost each day due to leaking, deteriorated pipes. In the United States alone, some 700 water main breaks occur each day.**



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a technology developed by: **SANEXEN**  
ENVIRONMENTAL SERVICES INC.

# Alaska CEs Use State-of-the-Art Technology to Renew Water Mains

Mr. Hazim K. Yunis, P.E.  
673 CES/CEPM

The water infrastructure at Joint Base Elmendorf-Richardson (JBER), Alaska, is over 70 years old and, like that at many other bases and cities in the country, is in great need of repair and renewal. A sizeable portion of the base's 350,000 feet of water mains is deteriorated. Although the base has worked over the years on replacing some of the old water distribution piping, breaks and leaks — and water shutdowns — occur regularly.

Many breaks are due to the old age of the pipes, regular ground movement, or ground heave due to frost or small earthquakes. Others are due to the water mains freezing in the winter. Complaints of low flows or pressures and red water (caused by rust) are common.

The breaks and leaks, and the shutdowns and repairs, all have a negative impact on the base's mission, its population of 18,000 (7,000 living on base), and the local traffic. Water shutdowns can last up to 12 hours, property landscape is destroyed, and street or driveway access is generally blocked.

Repairs also come with high financial costs, for several reasons. Alaska has a short construction period. Pipes have to be buried 10 feet, so the trenches are generally deep and wide (up to 40 feet). Breaks and leaks often happen during the winter when the ground

is frozen or at night or on weekends, requiring heavier equipment or more labor and overtime hours.

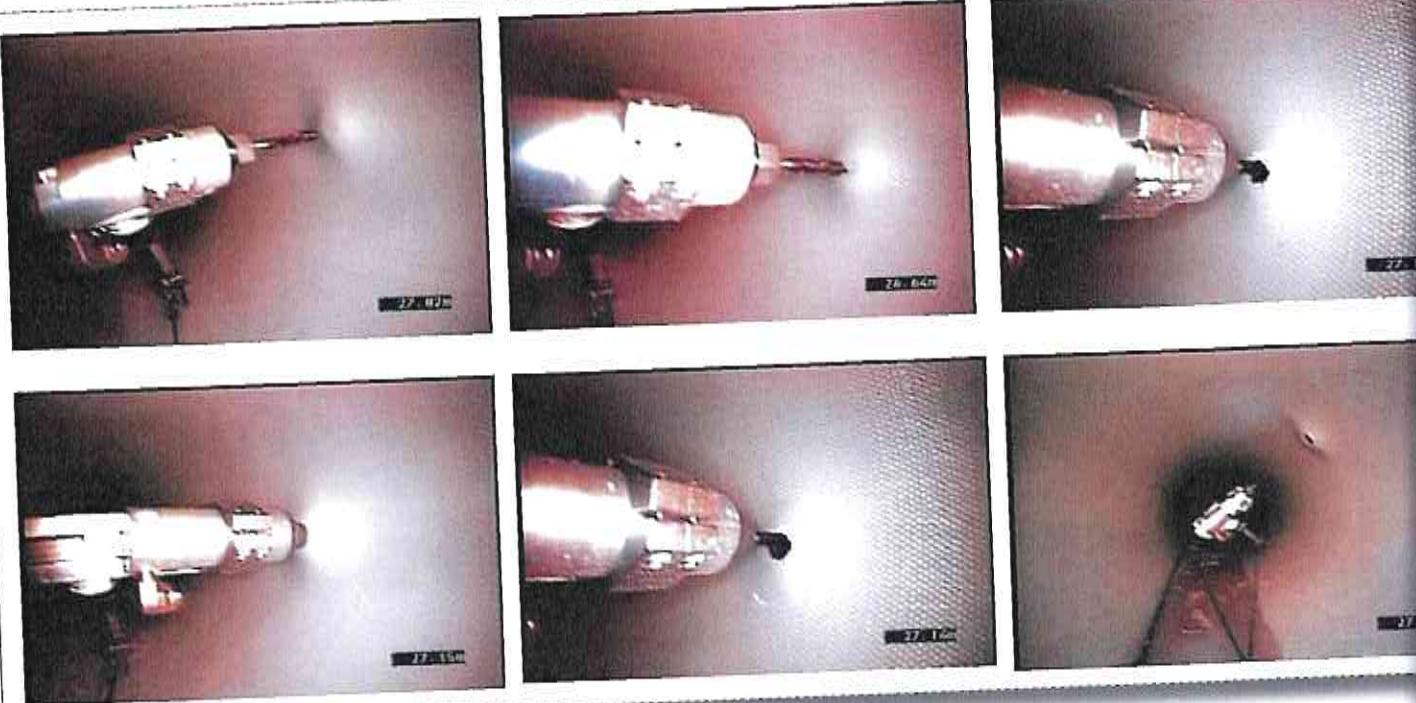
The effects on the base's mission and populace, coupled with the technical and financial issues weighed heavily in the choice of trenchless technology for the renewal of a water main in 2008 at one of JBER's housing areas. Base engineers had turned to the technology before, using it successfully in 1995 to renew deteriorated sewer mains. (Elmendorf AFB was actually the first to use trenchless technologies in the state of Alaska.)

This choice was made possible by a trenchless technology product called Aqua-Pipe® developed in 1997 by Sanexen Environmental Services specifically to rehabilitate small diameter water mains and also reinstate the small house connections from inside the pipe with the use of special robotic equipment. Certified to NSF/ANSI Standard 61, Aqua-Pipe® eliminates the need for trenches by installing a resin-impregnated flexible tube within the existing pipe to create a hard, impermeable, corrosion-resistant liner or "pipe-within-a-pipe." The liner can withstand all dead and live loads as well as internal pressures (including vacuum) without the help of the residual strength of the existing pipe.

No previous technology could line small diameter water mains and also reinstate the house connections from inside the pipe. Other trenchless technologies, such as slip-



Replacing pipes using traditional (non-trenchless) methods requires 40-wide excavation (left). During pipe repair at JBER using trenchless technology, a flexible liner is impregnated with epoxy (right), then pulled into existing pipe (center). (U.S. Air Force photos)



After liner is bonded to inside of existing pipe, house connections are reinstated from using robotic equipment. (courtesy photo)

lining, allowed for the renewal of the pipe but required an excavation at each house connection with the added disadvantage of greatly reducing the inside diameter and the flow within the existing pipe. All these small excavations defeated the purpose of using a low-dig solution to renew the existing water main.

In September 2008, JBER (then Elmendorf AFB) awarded a \$0.75M delivery order against a multiyear water/sewer/storm requirements contract to a state-certified installer of this technology for the structural renewal of 3,460 feet of 6-inch diameter cast iron and transite water mains in the housing area. Due to winter shutdown, work was carried out in the fall of 2008 and in the spring of 2009.

In order to continuously supply people with water, a temporary aboveground water bypass was installed. Access to the pipe was achieved by excavating small pits at strategic locations, approximately 400 feet apart. After cleaning the pipe, a closed circuit TV camera was inserted in the pipe to assure that it was cleaned to manufacturer specifications. The camera also recorded the location of every house (service) connection and a special robot inserted a plug in the connections to avoid the migration of resin into them.

Using the access pits, a liner was inserted (pulled) into the existing pipe. This flexible liner consists of two concentric, tubular, woven polyester jackets with a watertight polymer membrane bonded to the interior. The liner is impregnated with a resin epoxy that bonds to the interior of the existing pipe under applied heat. A foam pig pushed through the liner using water pressure shaped the liner, and then hot water was circulated through the liner to cure the resin into a hard, impermeable pipe and bond it to the existing water main. After pressure testing the liner, existing valves and hydrants were replaced with new ones and 34 service connections were reinstated from inside the pipe using special robotic equipment.

The project successfully restored the old pipe's structural integrity, giving it a new, greater than 50-year life. The project produced a 26-percent direct cost savings over using the open cut method, and construction was quicker. Although the indirect "savings" to the mission and base personnel can't be quantified, complaints can and the 673 CES received zero.

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*Mr. Yunis is a civil engineer with the 673 CES, Joint Base Elmendorf-Richardson, Alaska.*



# Technical Data



APRIL 26TH, 2016

**AQUA-PIPE™ INSTALLATION CRITICAL PARAMETERS****Step 1 – Host Pipe Cleaning (reaming)**

	Pressure (psi)	Flow (GPM)	Speed	Minimum # of passes (using scrapers/chains)
When using pressure jets only (minimum)	1800	65	Maximum	2
When using chain scrapper / reamer (minimum)	1500	50	Maximum	2

**Step 2 / Step 7 – Post Cleaning Pipe Inspection / Final Pipe Inspection (contract document stipulations take precedence)**

Recording Mode	Level of illumination	Velocity of movement	Camera orientation
AVI/MPEG	Optimal	5 m/min.	Same direction for both inspection
Visually inspect all service connections for at least 5 seconds.			

**Step 3 – Inserting Plugs In Service Connections**

Main stop diameter	1/2 in.	5/8 in.	3/4 in.	1 in.	1 1/4 in.	1 1/2 in.	2 in.	
White plugs	Please refer to Fer-Pal Cork Specification Sheet							
Note: Use A7/A81 epoxy with the plugs for all non-protruding main stops. All services greater than 2in must be excavated.								

**Step 4 – Liner Insertion**

Nominal pipe diameter	Minimum internal diameter of the pipe	Maximum internal diameter of the pipe	Epoxy ratio (L/m)	Gap between compression rollers (mm)	Epoxy temperature before impregnation	
					APH01	APH02
4 3/8 in.	4 in. (101 mm)	4 3/8 in. (112 mm)	1.10	12		
5 3/4 in.	5 7/8 in. (137 mm)	5 3/4 in. (146 mm)	1.25	13		
6 in.	5 3/4 in. (147 mm)	6 in (152mm)	1.30	13		
6 1/8 in.	6 in (152mm)	6 1/8 in. (156 mm)	1.30	13		
6 1/4 in.	6 1/8 in (157mm)	6 1/8 in (159mm)	1.30	13		
6 1/2 in.	6 1/4 in. (160 mm)	6 1/2 in. (165 mm)	1.35	13		
8 in.	7 3/4 in. (197 mm)	8 3/8 in. (213 mm)	1.75	16		
10 in.	9 3/4 in. (247 mm)	10 1/2 in. (267 mm)	2.25	16		
12 3/8 in	11 3/4 in ( 298mm)	12 3/8 in (314mm)	3.70	18		
12 5/8 in	12 3/8 in (314mm)	12 5/8 in (321mm)	3.70	18		

Note: All liners are to be sized to host pipe based on laser profiler data unless otherwise specified

**Step 5 – Forming and Curing of the Liner**

# of collars	Cold water forming					Cold water forming	Pressure (psi)	Hot water curing		Post-cure			
	Collar ** diameter (mm)	Number of pigs	Pig ** diameter (in.)	Pig ** Lengths (in.)	30 min. @ 25 psi ***			Temperature (°C) and Duration (hours)	APH01				
4 3/8 in.	3	140-150	1	5.5	10								
5 3/4 in.	3	140-150	1	8.5	16								
6 6 1/8, 6 1/4 in	3	145-155	1	8.5	16								
6 1/2 in.	3	150-162	1	8.5	16								
8 in.	4	195-205	1	11.5	16								
10 in.	4	252-265	1	14.5	18								
12 in.	4	145-155 x 2	1	17.5	24								

\*\* Equipment: Collars = Mikalor, Pigs = 1.5lbs/ft<sup>2</sup> & IFD= 33-38 lbs/50in<sup>2</sup> grade only.

\*\*\* Note: Pigs must always be pushed from the lower pipe extremity to the higher pipe extremity.

**Step 6 – Opening the Service Connections**

Main stop diameter	1/2 in.	5/8 in.	3/4 in.	1 in- 2 in	>2in to be excavated before lining.
Fer-Pal Robot bit	Please refer to cork specification chart				

## TECHNICAL SPECIFICATION SHEET

### AQUA-PIPE RESIN

#### DESCRIPTION :

The Aqua-Pipe Resin is a two components APR01 / APH01, 100% solids epoxy with room temperature cure. It allows a strong adhesion to a wide variety of materials. The formulation and mix ratio was developed as to allow all the components of the resin and hardener to form an integral part of the cured epoxy. These properties allow the use of the epoxy in potable water applications.

PROPERTIES	APR01	APH01
<b>BASE</b>	Epoxies resin	Polyamines hardener
<b>COLOR</b>	Light yellow	Amber yellow
<b>VISCOCITY (CPS @ 25° C)</b>	3000-4000	500-700
<b>RELATIVE DENSITY (water =1)</b>	1.13	0.97
<b>TOXICITY</b>	D-2B	D-1A; D-2A; D-2B; E
<b>FREEZING STABILITY</b>	NON	NON
<b>SHELF LIFE</b>	12 months	12 months
<b>CLEANING/DILUENT</b>		
<b>WEIGHT RATIO</b>	100 : 28	
<b>VOLUME RATIO</b>		100 : 33
<b>POT LIFE (25° C)</b>		50-70 minutes
<b>HARDNESS</b>		0075-85 (shore D)

REVISION DATE : 30-05-2012





NIEDNER

675 MERRILL STREET  
COATICOOK; QUEBEC; J1A 2S2  
CANADA

PRODUCT: APR01

CODE: N000001

## Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER ..... NIEDNER  
675 MERRILL STREET  
COATICOOK  
QUEBEC  
CANADA  
J1A 2S2  
PREPARED BY ..... REGULATORY AFFAIRS  
PREPARATION DATE ..... Jan05/15  
PRODUCT NAME ..... APR01  
PRODUCT CODE ..... N000001  
CHEMICAL NAME ..... MIXTURE.  
CHEMICAL FORMULA ..... MIXTURE.  
MOLECULAR WEIGHT ..... MIXTURE.  
MATERIAL USE ..... N.A.V.  
EMERGENCY PHONE NO ..... CANUTEC (613)-996-6666.

## Section 02: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW ..... WARNING! CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE RESPIRATORY TRACT IRRITATION. HEATED MATERIAL CAN CAUSE THERMAL BURNS.  
SKIN CONTACT ..... IRRITATING TO SKIN. MAY CAUSE SENSITIZATION BY SKIN CONTACT. HEATED MATERIAL CAN CAUSE THERMAL BURNS.  
SKIN ABSORPTION ..... N.A.V.  
EYE CONTACT ..... IRRITATING TO EYES. HEATED MATERIAL CAN CAUSE THERMAL BURNS.  
INHALATION ..... SLIGHTLY IRRITATING TO THE RESPIRATORY SYSTEM.  
INGESTION ..... INGESTION MAY CAUSE IRRITATION AND MALAISE.  
EFFECTS OF ACUTE EXPOSURE ..... SEE ABOVE.  
EFFECTS OF CHRONIC EXPOSURE ..... PROLONGED OR REPEATED CONTACT WITH SKIN MAY CAUSE REDNESS, ITCHING, IRRITATION, ECZEMA/CHAPPING AND OIL ACNE.  
EFFECTS OF OVEREXPOSURE ..... INHALATION: ADVERSE SYMPTOMS MAY INCLUDE THE FOLLOWING: RESPIRATORY TRACT IRRITATION, COUGHING. INGESTION: NO SPECIFIC DATA. SKIN: ADVERSE SYMPTOMS MAY INCLUDE THE FOLLOWING: IRRITATION, REDNESS. EYES: ADVERSE SYMPTOMS MAY INCLUDE THE FOLLOWING: PAIN OR IRRITATION, WATERING, REDNESS.  
MEDICAL CONDITIONS ..... PRE-EXISTING SKIN DISORDERS MAY BE AGGRAVATED BY OVER-EXPOSURE TO THIS AGGRAVATED BY EXPOSURE

## Section 03: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
4,4'-ISOPROPYLIDENEDI-PHENOL-EPICHLOROHYDRIN COPOLYMER	55-90	SEE SECTION 11	25068-38-6	SEE SECTION 11	SEE SECTION 11
EPICHLOROHYDRIN	3-4 PPM	SEE SECTION 11	106-89-8	SEE SECTION 11	SEE SECTION 11

## Section 04: FIRST AID MEASURES

EYE CONTACT .....	IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER AND LOWER EYELIDS. CHECK FOR AND REMOVE ANY CONTACT LENSES. GET MEDICAL ATTENTION.
SKIN CONTACT .....	FLUSH CONTAMINATED SKIN WITH PLENTY OF WATER. REMOVE CONTAMINATED CLOTHING AND SHOES. WASH CONTAMINATED CLOTHING THOROUGHLY WITH WATER BEFORE REMOVING IT, OR WEAR GLOVES. CONTINUE TO RINSE FOR AT LEAST 10 MINUTES. IN THE EVENT OF ANY COMPLAINTS OR SYMPTOMS, AVOID FURTHER EXPOSURE. WASH CLOTHING BEFORE REUSE. CLEAN SHOES THOROUGHLY BEFORE REUSE. FOR CONTACT WITH HOT PRODUCT, FLUSH CONTAMINATED SKIN WITH LARGE AMOUNTS OF COLD WATER TO DISSIPATE HEAT. COVER WITH CLEAN COTTON SHEETING OR GAUZE. GET MEDICAL ATTENTION IMMEDIATELY.
INHALATION .....	MOVE EXPOSED PERSON TO FRESH AIR. KEEP PERSON WARM AND AT REST. IF NOT BREATHING, IF BREATHING IS IRREGULAR OR IF RESPIRATORY ARREST OCCURS, PROVIDE ARTIFICIAL RESPIRATION OR OXYGEN BY TRAINED PERSONNEL. IT MAY BE DANGEROUS TO THE PERSON PROVIDING AID TO GIVE MOUTH-TO-MOUTH RESUSCITATION. GET MEDICAL ATTENTION IF ADVERSE HEALTH EFFECTS PERSIST OR ARE SEVERE. IF UNCONSCIOUS, PLACE IN RECOVERY POSITION AND GET MEDICAL ATTENTION IMMEDIATELY. MAINTAIN AN OPEN AIRWAY. LOOSEN TIGHT CLOTHING SUCH AS A COLLAR, TIE, BELT OR WAISTBAND.
INGESTION .....	WASH OUT MOUTH WITH WATER. REMOVE DENTURES IF ANY. MOVE EXPOSED PERSON TO FRESH AIR. KEEP PERSON WARM AND AT REST. IF MATERIAL HAS BEEN SWALLOWED AND THE EXPOSED PERSON IS CONSCIOUS, GIVE SMALL QUANTITIES OF WATER TO DRINK. STOP IF THE EXPOSED PERSON FEELS SICK AS VOMITING MAY BE DANGEROUS. DO NOT INDUCE VOMITING UNLESS DIRECTED TO DO SO BY MEDICAL PERSONNEL. IF VOMITING OCCURS, THE HEAD SHOULD BE KEPT LOW SO THAT VOMIT DOES NOT ENTER THE LUNGS. GET MEDICAL ATTENTION IF ADVERSE HEALTH EFFECTS PERSIST OR ARE SEVERE. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF UNCONSCIOUS, PLACE IN RECOVERY POSITION AND GET MEDICAL ATTENTION IMMEDIATELY. MAINTAIN AN OPEN AIRWAY. LOOSEN TIGHT CLOTHING SUCH AS A COLLAR, TIE, BELT OR WAISTBAND
NOTES TO PHYSICIAN .....	NO SPECIFIC TREATMENT. TREAT SYMPTOMATICALLY. CONTACT POISON TREATMENT SPECIALIST IMMEDIATELY IF LARGE QUANTITIES HAVE BEEN INGESTED OR INHALED.
OTHER INSTRUCTIONS .....	PROTECTION OF FIRST AID PERSONNEL: IN THE EVENT OF BODY CONTACT WITH MOLTEN MATERIAL, IMMEDIATELY COOL WITH RUNNING WATER; DO NOT ATTEMPT TO REMOVE MATERIAL FROM SKIN. IT MAY BE DANGEROUS TO THE PERSON PROVIDING AID TO GIVE MOUTH-TO-MOUTH RESUSCITATION.

## Section 05: FIRE FIGHTING MEASURES

FLAMMABILITY .....	NON FLAMMABLE.
IF YES, UNDER WHICH CONDITIONS?	
EXTINGUISHING MEDIA .....	FOAM, CARBON DIOXIDE (CO <sub>2</sub> ). DRY POWDER, WATER FOG.
FIRE FIGHTING PROCEDURES .....	FIRE-FIGHTERS SHOULD WEAR APPROPRIATE PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS (SCBA) WITH A FULL FACE-PIECE OPERATED IN POSITIVE PRESSURE MODE.
FLASH POINT (C), METHOD .....	>204 (C).
AUTO IGNITION TEMPERATURE .....	N.A.V.
UPPER FLAMMABLE LIMIT .....	N.A.V.
(% BY VOL.)	
LOWER FLAMMABLE LIMIT .....	N.A.V.
(% BY VOL.)	
SENSITIVITY TO STATIC DISCHARGE .....	N.A.V.
SENSITIVITY TO IMPACT .....	N.A.V.
HAZARDOUS .....	DECOMPOSITION PRODUCTS MAY INCLUDE THE FOLLOWING MATERIALS: CARBON OXIDES.
COMBUSTION PRODUCTS	
UNUSUAL FIRE AND EXPLOSION HAZARDS .....	PROMPTLY ISOLATE THE SCENE BY REMOVING ALL PERSONS FROM THE VICINITY OF THE INCIDENT IF THERE IS A FIRE. NO ACTION SHALL BE TAKEN INVOLVING ANY PERSONAL RISK OR WITHOUT SUITABLE TRAINING. IN A FIRE OR IF HEATED, A PRESSURE INCREASE WILL OCCUR AND THE CONTAINER MAY BURST.

**Section 06: ACCIDENTAL RELEASE MEASURES**

LEAK/SPILL .....	<p>PERSONAL PRECAUTIONS: NO ACTION SHALL BE TAKEN INVOLVING ANY PERSONAL RISK OR WITHOUT SUITABLE TRAINING. EVACUATE SURROUNDING AREAS. KEEP UNNECESSARY AND UNPROTECTED PERSONNEL FROM ENTERING. DO NOT TOUCH OR WALK THROUGH SPILLED MATERIAL. AVOID BREATHING VAPOR OR MIST. PROVIDE ADEQUATE VENTILATION. WEAR APPROPRIATE RESPIRATOR WHEN VENTILATION IS INADEQUATE. PUT ON APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (SEE SECTION 8).</p> <p>ENVIRONMENTAL PRECAUTIONS: AVOID DISPERSAL OF SPILLED MATERIAL AND RUNOFF AND CONTACT WITH SOIL, WATERWAYS, DRAINS AND SEWERS. INFORM THE RELEVANT AUTHORITIES IF THE PRODUCT HAS CAUSED ENVIRONMENTAL POLLUTION (SEWERS, WATERWAYS, SOIL OR AIR).</p> <p>LARGE SPILL: STOP LEAK IF WITHOUT RISK. MOVE CONTAINERS FROM SPILL AREA. APPROACH RELEASE FROM UPWIND. PREVENT ENTRY INTO SEWERS, WATER COURSES, BASEMENTS OR CONFINED AREAS. FOR MOLTEN MATERIAL, ALLOW THE PRODUCT TO COOL AND SOLIDIFY. VACUUM OR SWEEP UP MATERIAL AND PLACE IN A DESIGNATED, LABELED WASTE CONTAINER. DISPOSE OF VIA A LICENSED WASTE DISPOSAL CONTRACTOR. CONTAMINATED ABSORBENT MATERIAL MAY POSE THE SAME HAZARD AS THE SPILLED PRODUCT.</p> <p>NOTE: SEE SECTION 1 FOR EMERGENCY CONTACT INFORMATION AND SECTION 13 FOR WASTE DISPOSAL.</p> <p>SMALL SPILL: STOP LEAK IF WITHOUT RISK. MOVE CONTAINERS FROM SPILL AREA. FOR MOLTEN MATERIAL, ALLOW THE PRODUCT TO COOL AND SOLIDIFY. VACUUM OR SWEEP UP MATERIAL AND PLACE IN A DESIGNATED, LABELED WASTE CONTAINER. DISPOSE OF VIA A LICENSED WASTE DISPOSAL CONTRACTOR.</p>
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**Section 07: HANDLING AND STORAGE**

HANDLING PROCEDURES AND EQUIPMENT .....	PUT ON APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (SEE SECTION 8). EATING, DRINKING AND SMOKING SHOULD BE PROHIBITED IN AREAS WHERE THIS MATERIAL IS HANDLED, STORED AND PROCESSED. WORKERS SHOULD WASH HANDS AND FACE BEFORE EATING, DRINKING AND SMOKING. PERSONS WITH A HISTORY OF SKIN SENSITIZATION PROBLEMS SHOULD NOT BE EMPLOYED IN ANY PROCESS IN WHICH THIS PRODUCT IS USED. DO NOT GET IN EYES OR ON SKIN OR CLOTHING. DO NOT BREATHE VAPOR OR MIST. DO NOT INGEST. USE ONLY WITH ADEQUATE VENTILATION. WEAR APPROPRIATE RESPIRATOR WHEN VENTILATION IS INADEQUATE. KEEP IN THE ORIGINAL CONTAINER OR AN APPROVED ALTERNATIVE MADE FROM A COMPATIBLE MATERIAL, KEPT TIGHTLY CLOSED WHEN NOT IN USE. EMPTY CONTAINERS RETAIN PRODUCT RESIDUE AND CAN BE HAZARDOUS. DO NOT REUSE CONTAINER.
STORAGE NEEDS .....	STORE IN ACCORDANCE WITH LOCAL REGULATIONS. STORE IN ORIGINAL CONTAINER PROTECTED FROM DIRECT SUNLIGHT IN A DRY, COOL AND WELL-VENTILATED AREA, AWAY FROM INCOMPATIBLE MATERIALS (SEE SECTION 10) AND FOOD AND DRINK. KEEP CONTAINER TIGHTLY CLOSED AND SEALED UNTIL READY FOR USE. CONTAINERS THAT HAVE BEEN OPENED MUST BE CAREFULLY RESEALED AND KEPT UPRIGHT TO PREVENT LEAKAGE. DO NOT STORE IN UNLABELED CONTAINERS. USE APPROPRIATE CONTAINMENT TO AVOID ENVIRONMENTAL CONTAMINATION. NOTE: THIS RESIN MAY BE HANDLED, SHIPPED AND STORED AT ELEVATED TEMPERATURE IN BULK.

**Section 08: EXPOSURE CONTROLS AND PERSONAL PROTECTION**

FOOTWEAR/TYPE .....	PROTECTIVE FOOTWEAR.
EYE/TYPE .....	SAFETY EYEWEAR COMPLYING WITH AN APPROVED STANDARD SHOULD BE USED WHEN A RISK ASSESSMENT INDICATES THIS IS NECESSARY TO AVOID EXPOSURE TO LIQUID SPLASHES, MISTS, GASES OR DUSTS. WEAR APPROVED SAFETY GLASSES OR GOGGLES. USE A PROPERLY FITTED, AIR-PURIFYING OR AIR-FED RESPIRATOR COMPLYING WITH AN APPROVED STANDARD IF A RISK ASSESSMENT INDICATES THIS IS NECESSARY. RESPIRATOR SELECTION MUST BE BASED ON KNOWN OR ANTICIPATED EXPOSURE LEVELS, THE HAZARDS OF THE PRODUCT AND THE SAFE WORKING LIMITS OF THE SELECTED RESPIRATOR.
RESPIRATORY/TYPE .....	
GLOVES/ TYPE .....	WEAR PROTECTIVE GLOVES. BUTYL RUBBER GLOVES ARE RECOMMENDED BUT BE AWARE THAT THE LIQUID MAY PENETRATE THE GLOVES. FREQUENT CHANGE IS ADVISABLE. SUITABLE GLOVES CAN BE RECOMMENDED BY THE GLOVE SUPPLIER. WEAR APPROPRIATE CLOTHING TO PREVENT ANY POSSIBILITY OF SKIN CONTACT.
CLOTHING/TYPE .....	PERSONAL PROTECTIVE EQUIPMENT FOR THE BODY SHOULD BE SELECTED BASED ON THE TASK BEING PERFORMED AND THE RISKS INVOLVED AND SHOULD BE APPROVED BY A SPECIALIST BEFORE HANDLING THIS PRODUCT.
OTHER/TYPE .....	ENSURE THAT EYEWASH STATIONS AND SAFETY SHOWERS ARE CLOSE TO THE WORKSTATION LOCATION.
HYGIENE MEASURES .....	WASH HANDS, FOREARMS AND FACE THOROUGHLY AFTER HANDLING CHEMICAL PRODUCTS, BEFORE EATING, SMOKING AND USING THE LAVATORY AND AT THE END OF THE WORKING PERIOD. APPROPRIATE TECHNIQUES SHOULD BE USED TO REMOVE POTENTIALLY CONTAMINATED CLOTHING. WASH CONTAMINATED CLOTHING BEFORE REUSING.
ENGINEERING CONTROLS .....	USE ONLY WITH ADEQUATE VENTILATION. IF USER OPERATIONS GENERATE DUST, FUMES, GAS, VAPOR OR MIST, USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION OR OTHER ENGINEERING CONTROLS TO KEEP WORKER EXPOSURE TO AIRBORNE CONTAMINANTS BELOW ANY RECOMMENDED OR STATUTORY LIMITS.

**Section 09: PHYSICAL AND CHEMICAL PROPERTIES**

PHYSICAL STATE .....	LIQUID.
ODOUR .....	OIL-LIKE ODOR.
ODOUR THRESHOLD .....	N.AV.
VAPOUR PRESSURE (MMHG) .....	N.AV.
VAPOUR DENSITY (AIR=1) .....	N.AV.
EVAPORATION RATE .....	N.AV.
BOILING POINT .....	>260 (C).
PH .....	N.AV.
SPECIFIC GRAVITY (WATER=1) .....	0.99 - 1.17.
SOLUBILITY IN WATER (% W/W) .....	N.AV.
COEFFICIENT OF WATER/OIL DIST. ....	N.AV.

**Section 10: STABILITY AND REACTIVITY**

CHEMICAL STABILITY .....	THE PRODUCT IS STABLE. UNDER NORMAL CONDITIONS OF STORAGE AND USE.
CONDITIONS TO AVOID .....	CONTACT WITH INCOMPATIBLES.
MATERIALS TO AVOID .....	OXIDIZING MATERIALS, STRONG ACIDS, STRONG ALKALIS. STRONG ACIDS. STRONG BASES.
REACTIVITY CONDITIONS .....	REACTS WITH CONSIDERABLE HEAT RELEASE WITH SOME CURING AGENTS.
HAZARDOUS PRODUCTS OF DECOMPOSITION .....	DECOMPOSITION PRODUCTS MAY INCLUDE THE FOLLOWING MATERIALS: CARBON OXIDES, NITROGEN OXIDES. HYDROGEN CHLORIDE.
HAZARDOUS POLYMERIZATION .....	WILL NOT OCCUR.

**Section 11: TOXICOLOGICAL INFORMATION**

EXPOSURE LIMIT OF MATERIAL .....	N.AV.
LC 50 OF MATERIAL .....	N.AV.
SPECIES & ROUTE LD 50 OF MATERIAL .....	4,4'-ISOPROPYLIDENEDIPHENOL-EPICHLOROHYDRIN COPOLYMER: LD50 ORAL RAT 30,000 MG/KG; LD50 DERMAL RAT > 1,200 MG/KG, EPICHLOROHYDRIN (106-89-8) ACUTE DERMAL LD50 RABBIT: 300 MG/KG; ACUTE ORAL LD50 RAT: 40 MG/KG.
SPECIES & ROUTE CARCINOGENICITY OF MATERIAL .....	4,4'-ISOPROPYLIDENEDIPHENOL-EPICHLOROHYDRIN COPOLYMER: ACGIH NOT CLASSIFIED; IARC NOT CLASSIFIED; NTP NOT LISTED; OSHA NOT REGULATED, EPICHLOROHYDRIN KNOWN TO CAUSE CANCER IN LABORATORY ANIMALS. ACGIH: A3 CONFIRMED ANIMAL CARCINOGEN WITH UNKNOWN RELEVANCE TO HUMANS. IARC MONOGRAPHS, 2A PROBABLY CARCINOGENIC TO HUMANS. US NTP: ANTICIPATED CARCINOGEN.
REPRODUCTIVE EFFECTS .....	N.AV.
IRRITANCY OF MATERIAL .....	SEE SECTION 02.
SENSITIZING CAPABILITY OF MATERIAL .....	N.AV.
SYNERGISTIC MATERIALS .....	N.AV.
MUTAGENICITY .....	EPICHLOROHYDRIN: LAB TESTS FOUND THIS PRODUCT A WEAK MUTAGEN IN THE AMES TEST AND MUTAGENIC IN THE MOUSE LYMPHOMA CELL TEST.
TERATOGENICITY .....	N.AV.

**Section 12: ECOLOGICAL CONSIDERATIONS**

ECOLOGICAL INFORMATION .....	N.AV.
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**Section 13: DISPOSAL CONSIDERATIONS**

WASTE DISPOSAL .....	DISPOSE IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
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**Section 14: TRANSPORT INFORMATION**

TDG CLASSIFICATION .....	NOT REGULATED.
UN NUMBER .....	N.A.P.
PACKING GROUP .....	N.A.P.
SPECIAL SHIPPING INSTRUCTIONS .....	NOT REGULATED.

**Section 15: REGULATORY INFORMATION**

CPR COMPLIANCE .....	THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.
WHMIS CLASSIFICATION .....	D2B.

**Section 16: OTHER INFORMATION**

N.A.P.=NOT APPLICABLE

N.A.V.=NOT AVAILABLE

OTHER INFORMATION .....	THE DATA IN THIS MSDS RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED HEREIN AND DOES NOT RELATE TO USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY PROCESS. THIS DATA IS OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS PRODUCT SPECIFICATIONS. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS HEREBY MADE. THE RECOMMENDED INDUSTRIAL HYGIENE AND SAFE HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTENDED USE AND DETERMINE WHETHER THEY ARE APPROPRIATE.
-------------------------	--

NIEDNER

675 MERRILL STREET  
COATICOOK, QUEBEC, J1A 2S2  
CANADA

PRODUCT: APH01

CODE: N000002

## Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER ..... NIEDNER  
675 MERRILL STREET  
COATICOOK  
QUEBEC  
CANADA  
J1A 2S2

PREPARED BY ..... REGULATORY AFFAIRS

PREPARATION DATE ..... Jan05/15

PRODUCT NAME ..... APH01

PRODUCT CODE ..... N000002

CHEMICAL NAME ..... MIXTURE.

CHEMICAL FORMULA ..... MIXTURE.

MOLECULAR WEIGHT ..... MIXTURE.

MATERIAL USE ..... N.A.V.

EMERGENCY PHONE NO ..... CANUTEC (613)-998-6666.

## Section 02: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW ..... DANGER! TOXIC IF INHALED. HARMFUL IN CONTACT WITH SKIN OR IF SWALLOWED. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. CROSS-SENSITIZATION TO OTHER AMINES MAY OCCUR.

SKIN CONTACT ..... CORROSIVE TO THE SKIN. CAUSES BURNS. HARMFUL IN CONTACT WITH SKIN. MAY CAUSE SENSITIZATION BY SKIN CONTACT.

SKIN ABSORPTION ..... N.A.V.

EYE CONTACT ..... RISK OF SERIOUS DAMAGE TO EYES. CORROSIVE TO EYES. CAUSES BURNS. EXCESSIVE TEAR FORMATION.

INHALATION ..... CORROSIVE TO THE RESPIRATORY SYSTEM. MAY CAUSE SENSITIZATION BY INHALATION. EXPOSURE TO DECOMPOSITION PRODUCTS MAY CAUSE A HEALTH HAZARD. SERIOUS EFFECTS MAY BE DELAYED FOLLOWING EXPOSURE. TOXIC IF INHALED.

INGESTION ..... MAY CAUSE BURNS TO MOUTH, THROAT AND STOMACH. HARMFUL IF SWALLOWED. SEE ABOVE.

EFFECTS OF ACUTE EXPOSURE ..... SEE ABOVE.

EFFECTS OF CHRONIC EXPOSURE ..... CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: KIDNEYS, LUNGS, LIVER.

EFFECTS OF OVEREXPOSURE ..... INHALATION: ADVERSE SYMPTOMS MAY INCLUDE THE FOLLOWING: RESPIRATORY TRACT IRRITATION, COUGHING, WHEEZING AND BREATHING DIFFICULTIES, ASTHMA. INGESTION: ADVERSE SYMPTOMS MAY INCLUDE THE FOLLOWING: STOMACH PAINS. SKIN: ADVERSE SYMPTOMS MAY INCLUDE THE FOLLOWING: PAIN OR IRRITATION, REDNESS, BLISTERING MAY OCCUR. EYES: ADVERSE SYMPTOMS MAY INCLUDE THE FOLLOWING: PAIN, WATERING, REDNESS.

MEDICAL CONDITIONS ..... PRE-EXISTING RESPIRATORY AND SKIN DISORDERS AND DISORDERS INVOLVING ANY OTHER TARGET ORGANS MENTIONED IN THIS MSDS AS BEING AT RISK MAY BE AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT.

## Section 03: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
FATTY ACIDS, C18-UNSATD., DIMERS, REACTION PRODUCTS WITH POLYETHYLENEPOLYAMINES TRIETHYLENETETRAMINE	30-65	SEE SECTION 11	68410-23-1	SEE SECTION 11	SEE SECTION 11
	30-50	SEE SECTION 11	112-24-3	SEE SECTION 11	SEE SECTION 11

### Section 04: FIRST AID MEASURES

EYE CONTACT.....	GET MEDICAL ATTENTION IMMEDIATELY. IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER AND LOWER EYELIDS. CHECK FOR AND REMOVE ANY CONTACT LENSES. CHEMICAL BURNS MUST BE TREATED PROMPTLY BY A PHYSICIAN.
SKIN CONTACT .....	FLUSH CONTAMINATED SKIN WITH PLENTY OF WATER. REMOVE CONTAMINATED CLOTHING AND SHOES. WASH CONTAMINATED CLOTHING THOROUGHLY WITH WATER BEFORE REMOVING OR WEAR GLOVES. CONTINUE TO RINSE FOR AT LEAST 10 MINUTES. CHEMICAL BURNS MUST BE TREATED PROMPTLY BY A PHYSICIAN. IN THE EVENT OF ANY COMPLAINTS OR SYMPTOMS, AVOID FURTHER EXPOSURE. WASH CLOTHING BEFORE REUSE. CLEAN SHOES THOROUGHLY BEFORE REUSE. GET MEDICAL ATTENTION IMMEDIATELY.
INHALATION.....	GET MEDICAL ATTENTION IMMEDIATELY. MOVE EXPOSED PERSON TO FRESH AIR. IF IT IS SUSPECTED THAT FUMES ARE STILL PRESENT, THE RESCUER SHOULD WEAR AN APPROPRIATE MASK OR SELF-CONTAINED BREATHING APPARATUS. KEEP PERSON WARM AND AT REST. IF NOT BREATHING, IF BREATHING IS IRREGULAR OR IF RESPIRATORY ARREST OCCURS, PROVIDE ARTIFICIAL RESPIRATION OR OXYGEN BY TRAINED PERSONNEL. IT MAY BE DANGEROUS TO THE PERSON PROVIDING AID TO GIVE MOUTH-TO-MOUTH RESUSCITATION. IF UNCONSCIOUS, PLACE IN RECOVERY POSITION AND GET MEDICAL ATTENTION IMMEDIATELY. MAINTAIN AN OPEN AIRWAY. LOOSEN TIGHT CLOTHING SUCH AS A COLLAR, TIE, BELT OR WAISTBAND. IN CASE OF INHALATION OF DECOMPOSITION PRODUCTS IN A FIRE, SYMPTOMS MAY BE DELAYED. THE EXPOSED PERSON MAY NEED TO BE KEPT UNDER MEDICAL SURVEILLANCE FOR 48 HOURS. IN THE EVENT OF ANY COMPLAINTS OR SYMPTOMS, AVOID FURTHER EXPOSURE.
INGESTION .....	GET MEDICAL ATTENTION IMMEDIATELY. WASH OUT MOUTH WITH WATER. REMOVE DENTURES IF ANY. MOVE EXPOSED PERSON TO FRESH AIR. KEEP PERSON WARM AND AT REST. IF MATERIAL HAS BEEN SWALLOWED AND THE EXPOSED PERSON IS CONSCIOUS, GIVE SMALL QUANTITIES OF WATER TO DRINK. STOP IF THE EXPOSED PERSON FEELS SICK AS VOMITING MAY BE DANGEROUS. DO NOT INDUCE VOMITING UNLESS DIRECTED TO DO SO BY MEDICAL PERSONNEL. IF VOMITING OCCURS, THE HEAD SHOULD BE KEPT LOW SO THAT VOMIT DOES NOT ENTER THE LUNGS. CHEMICAL BURNS MUST BE TREATED PROMPTLY BY A PHYSICIAN. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF UNCONSCIOUS, PLACE IN RECOVERY POSITION AND GET MEDICAL ATTENTION IMMEDIATELY. MAINTAIN AN OPEN AIRWAY. LOOSEN TIGHT CLOTHING SUCH AS A COLLAR, TIE, BELT OR WAISTBAND.
NOTES TO PHYSICIAN.....	IN CASE OF INHALATION OF DECOMPOSITION PRODUCTS IN A FIRE, SYMPTOMS MAY BE DELAYED. THE EXPOSED PERSON MAY NEED TO BE KEPT UNDER MEDICAL SURVEILLANCE FOR 48 HOURS.

### Section 05: FIRE FIGHTING MEASURES

FLAMMABILITY .....	NON FLAMMABLE.
IF YES, UNDER WHICH CONDITIONS?	
EXTINGUISHING MEDIA.....	USE AN EXTINGUISHING AGENT SUITABLE FOR THE SURROUNDING FIRE. DO NOT USE WATER JET. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE WATER. WATER OR FOG MAY CAUSE FROTHING WHICH CAN BE VIOLENT, ESPECIALLY IF SPRAYED INTO CONTAINERS OF HOT OR BURNING LIQUID.
FIRE FIGHTING PROCEDURES.....	PROMPTLY ISOLATE THE SCENE BY REMOVING ALL PERSONS FROM THE VICINITY OF THE INCIDENT IF THERE IS A FIRE. NO ACTION SHALL BE TAKEN INVOLVING ANY PERSONAL RISK OR WITHOUT SUITABLE TRAINING. FIRE-FIGHTERS SHOULD WEAR APPROPRIATE PROTECTIVE EQUIPMENT AND SELFCONTAINED BREATHING APPARATUS (SCBA) WITH A FULL FACE-PIECE OPERATED IN POSITIVE PRESSURE MODE.
FLASH POINT (C), METHOD .....	>122 (C).
AUTO IGNITION TEMPERATURE .....	N.AV.
UPPER FLAMMABLE LIMIT .....	N.AV.
(% BY VOL.)	
LOWER FLAMMABLE LIMIT .....	N.AV.
(% BY VOL.)	
SENSITIVITY TO STATIC DISCHARGE .....	N.AV.
SENSITIVITY TO IMPACT .....	N.AV.
HAZARDOUS.....	MAY INCLUDE THE FOLLOWING MATERIALS: CARBON OXIDES, NITROGEN OXIDES.
COMBUSTION PRODUCTS	
UNUSUAL FIRE AND EXPLOSION.....	IN A FIRE OR IF HEATED, A PRESSURE INCREASE WILL OCCUR AND THE CONTAINER MAY BURST.
HAZARDS	

**Section 06: ACCIDENTAL RELEASE MEASURES**

## LEAK/SPILL .....

NO ACTION SHALL BE TAKEN INVOLVING ANY PERSONAL RISK OR WITHOUT SUITABLE TRAINING. EVACUATE SURROUNDING AREAS. KEEP UNNECESSARY AND UNPROTECTED PERSONNEL FROM ENTERING. DO NOT TOUCH OR WALK THROUGH SPILLED MATERIAL. SHUT OFF ALL IGNITION SOURCES. NO FLARES, SMOKING OR FLAMES IN HAZARD AREA. PROVIDE ADEQUATE VENTILATION. WEAR APPROPRIATE RESPIRATOR WHEN VENTILATION IS INADEQUATE. PUT ON APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (SEE SECTION 8). AVOID DISPERSAL OF SPILLED MATERIAL AND RUNOFF AND CONTACT WITH SOIL, WATERWAYS, DRAINS AND SEWERS. INFORM THE RELEVANT AUTHORITIES IF THE PRODUCT HAS CAUSED ENVIRONMENTAL POLLUTION (SEWERS, WATERWAYS, SOIL OR AIR). LARGE SPILL: STOP LEAK IF WITHOUT RISK. MOVE CONTAINERS FROM SPILL AREA. APPROACH RELEASE FROM UPWIND. PREVENT ENTRY INTO SEWERS, WATER COURSES, BASEMENTS OR CONFINED AREAS. WASH SPILLAGES INTO AN EFFLUENT TREATMENT PLANT OR PROCEED AS FOLLOWS. CONTAIN AND COLLECT SPILLAGE WITH NONCOMBUSTIBLE, ABSORBENT MATERIAL E.G. SAND, EARTH, VERMICULITE OR DIATOMACEOUS EARTH AND PLACE IN CONTAINER FOR DISPOSAL ACCORDING TO LOCAL REGULATIONS (SEE SECTION 13). DISPOSE OF VIA A LICENSED WASTE DISPOSAL CONTRACTOR. CONTAMINATED ABSORBENT MATERIAL MAY POSE THE SAME HAZARD AS THE SPILLED PRODUCT. NOTE: SEE SECTION 1 FOR EMERGENCY CONTACT INFORMATION AND SECTION 13 FOR WASTE DISPOSAL. SMALL SPILL: STOP LEAK IF WITHOUT RISK. MOVE CONTAINERS FROM SPILL AREA. DILUTE WITH WATER AND MOP UP IF WATER-SOLUBLE OR ABSORB WITH AN INERT DRY MATERIAL AND PLACE IN AN APPROPRIATE WASTE DISPOSAL CONTAINER. DISPOSE OF VIA A LICENSED WASTE DISPOSAL CONTRACTOR.

**Section 07: HANDLING AND STORAGE**

## HANDLING PROCEDURES AND EQUIPMENT .....

PUT ON APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (SEE SECTION 8). EATING, DRINKING AND SMOKING SHOULD BE PROHIBITED IN AREAS WHERE THIS MATERIAL IS HANDLED, STORED AND PROCESSED. WORKERS SHOULD WASH HANDS AND FACE BEFORE EATING, DRINKING AND SMOKING. PERSONS WITH A HISTORY OF SKIN SENSITIZATION PROBLEMS OR ASTHMA, ALLERGIES OR CHRONIC OR RECURRENT RESPIRATORY DISEASE SHOULD NOT BE EMPLOYED IN ANY PROCESS IN WHICH THIS PRODUCT IS USED. AVOID EXPOSURE DURING PREGNANCY. DO NOT GET IN EYES OR ON SKIN OR CLOTHING. DO NOT BREATHE VAPOR OR MIST. DO NOT INGEST. USE ONLY WITH ADEQUATE VENTILATION. WEAR APPROPRIATE RESPIRATOR WHEN VENTILATION IS INADEQUATE. KEEP IN THE ORIGINAL CONTAINER OR AN APPROVED ALTERNATIVE MADE FROM A COMPATIBLE MATERIAL, KEPT TIGHTLY CLOSED WHEN NOT IN USE. EMPTY CONTAINERS RETAIN PRODUCT RESIDUE AND CAN BE HAZARDOUS. DO NOT REUSE CONTAINER.

## STORAGE NEEDS .....

STORE IN ACCORDANCE WITH LOCAL REGULATIONS. STORE IN ORIGINAL CONTAINER PROTECTED FROM DIRECT SUNLIGHT IN A DRY, COOL AND WELL-VENTILATED AREA, AWAY FROM INCOMPATIBLE MATERIALS (SEE SECTION 10) AND FOOD AND DRINK. KEEP CONTAINER TIGHTLY CLOSED AND SEALED UNTIL READY FOR USE. CONTAINERS THAT HAVE BEEN OPENED MUST BE CAREFULLY RESEALED AND KEPT UPRIGHT TO PREVENT LEAKAGE. DO NOT STORE IN UNLABELED CONTAINERS. USE APPROPRIATE CONTAINMENT TO AVOID ENVIRONMENTAL CONTAMINATION.

## Section 08: EXPOSURE CONTROLS AND PERSONAL PROTECTION

FOOTWEAR/TYPE .....	PROTECTIVE FOOTWEAR.
EYE/TYPE .....	SAFETY EYEWEAR COMPLYING WITH AN APPROVED STANDARD SHOULD BE USED WHEN A RISK ASSESSMENT INDICATES THIS IS NECESSARY TO AVOID EXPOSURE TO LIQUID SPLASHES, MISTS, GASES OR DUSTS.
RESPIRATORY/TYPE .....	USE A PROPERLY FITTED, AIR-PURIFYING OR AIR-FED RESPIRATOR COMPLYING WITH AN APPROVED STANDARD IF A RISK ASSESSMENT INDICATES THIS IS NECESSARY. RESPIRATOR SELECTION MUST BE BASED ON KNOWN OR ANTICIPATED EXPOSURE LEVELS, THE HAZARDS OF THE PRODUCT AND THE SAFE WORKING LIMITS OF THE SELECTED RESPIRATOR.
GLOVES/ TYPE .....	CHEMICAL-RESISTANT, IMPERVIOUS GLOVES COMPLYING WITH AN APPROVED STANDARD SHOULD BE WORN AT ALL TIMES WHEN HANDLING CHEMICAL PRODUCTS IF A RISK ASSESSMENT INDICATES THIS IS NECESSARY. RECOMMENDED: NEOPRENE GLOVES, NITRILE RUBBER GLOVES, GAUNTLET TYPE.
CLOTHING/TYPE .....	PERSONAL PROTECTIVE EQUIPMENT FOR THE BODY SHOULD BE SELECTED BASED ON THE TASK BEING PERFORMED AND THE RISKS INVOLVED AND SHOULD BE APPROVED BY A SPECIALIST BEFORE HANDLING THIS PRODUCT.
OTHER/TYPE .....	ENSURE THAT EYEWASH STATIONS AND SAFETY SHOWERS ARE CLOSE TO THE WORKSTATION LOCATION.
HYGIENE MEASURES .....	WASH HANDS, FOREARMS AND FACE THOROUGHLY AFTER HANDLING CHEMICAL PRODUCTS, BEFORE EATING, SMOKING AND USING THE LAVATORY AND AT THE END OF THE WORKING PERIOD. APPROPRIATE TECHNIQUES SHOULD BE USED TO REMOVE POTENTIALLY CONTAMINATED CLOTHING. WASH CONTAMINATED CLOTHING BEFORE REUSING.
ENGINEERING CONTROLS .....	USE ONLY WITH ADEQUATE VENTILATION. USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION OR OTHER ENGINEERING CONTROLS TO KEEP WORKER EXPOSURE TO AIRBORNE CONTAMINANTS BELOW ANY RECOMMENDED OR STATUTORY LIMITS. EMISSIONS FROM VENTILATION OR WORK PROCESS EQUIPMENT SHOULD BE CHECKED TO ENSURE THEY COMPLY WITH THE REQUIREMENTS OF ENVIRONMENTAL PROTECTION LEGISLATION. IN SOME CASES, FUME SCRUBBERS, FILTERS OR ENGINEERING MODIFICATIONS TO THE PROCESS EQUIPMENT WILL BE NECESSARY TO REDUCE EMISSIONS TO ACCEPTABLE LEVELS.

## Section 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE .....	LIQUID.
ODOUR .....	AMINE.
ODOUR THRESHOLD .....	N.AV.
VAPOUR PRESSURE (MMHG) .....	N.AV.
VAPOUR DENSITY (AIR=1) .....	
BY VOLUME .....	N.AV.
BY WEIGHT .....	N.AV.
EVAPORATION RATE .....	N.AV.
BOILING POINT .....	N.AV.
PH .....	N.AV.
SPECIFIC GRAVITY (WATER=1) .....	0.970 - 0.980.
SOLUBILITY IN WATER (% W/W) .....	N.AV.
COEFFICIENT OF WATER/OIL DIST.....	N.AV.

## Section 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY .....	THE PRODUCT IS STABLE. UNDER NORMAL CONDITIONS OF STORAGE AND USE.
CONDITIONS TO AVOID .....	AVOID ALL POSSIBLE SOURCES OF IGNITION (SPARK OR FLAME). EXPOSURE TO WATER VAPOUR. STRONG OXIDIZER. HEATING THIS SUBSTANCE ABOVE 300 DEG. F IN THE PRESENCE OF AIR MAY CAUSE SLOW OXIDATIVE DECOMPOSITION; ABOVE 500 DEG. F POLYMERIZATION MAY OCCUR. SOME COMBINATIONS OF RESINS AND CURING AGENTS CAN PRODUCE EXOTHERMIC REACTIONS WHICH IN LARGE MASSES CAN CAUSE RUNAWAY POLYMERIZATION AND CHARRING OF THE REACTANTS FUMES AND VAPORS FROM THE THERMAL AND CHEMICAL DECOMPOSITIONS VARY WIDELY IN COMPOSITION AND TOXICITY.
MATERIALS TO AVOID .....	STRONG OXIDIZING AGENTS, ACIDS.
REACTIVITY CONDITIONS .....	CONTACT WITH INCOMPATIBLES.
HAZARDOUS PRODUCTS OF DECOMPOSITION .....	UNDER NORMAL CONDITIONS OF STORAGE AND USE, HAZARDOUS DECOMPOSITION PRODUCTS SHOULD NOT BE PRODUCED. DECOMPOSITION PRODUCTS MAY INCLUDE THE FOLLOWING MATERIALS: NITROGEN OXIDES, CARBON MONOXIDE, OTHER ORGANIC COMPOUNDS.
HAZARDOUS POLYMERIZATION .....	WILL NOT OCCUR.

**Section 11: TOXICOLOGICAL INFORMATION**

EXPOSURE LIMIT OF MATERIAL .....	TRIETHYLENETETRAMINE: AIHA WEEL 8-HR TWA - 1 PPM.
LC 50 OF MATERIAL, .....	N.A.V.
SPECIES & ROUTE	
LD 50 OF MATERIAL,.....	FATTY ACIDS, C18-UNSATD., DIMERS, REACTION PRODUCTS WITH POLYETHYLENEPOLYAMINES: LD50 ORAL RAT > 5,000 MG/KG.
SPECIES & ROUTE	TRIETHYLENETETRAMINE: LD50 ORAL RABBIT 5,500 MG/KG; LD50 ORAL MOUSE 38.5 MG/KG; LD50 ORAL RAT 1,080 MG/KG; LD50 DERMAL RABBIT 675 MG/KG.
CARCINOGENICITY OF MATERIAL.....	NO (NTP, IARC, OSHA, ACGIH).
REPRODUCTIVE EFFECTS .....	N.A.V.
IRRITANCY OF MATERIAL.....	SEE SECTION 02.
SENSITIZING CAPABILITY OF .....	N.A.V.
MATERIAL	
SYNERGISTIC MATERIALS.....	N.A.V.
MUTAGENICITY .....	N.A.V.
TERATOGENICITY.....	CONTAINS MATERIAL WHICH MAY CAUSE BIRTH DEFECTS, BASED ON ANIMAL DATA.

**Section 12: ECOLOGICAL CONSIDERATIONS**

ECOLOGICAL INFORMATION.....	N.A.V.
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**Section 13: DISPOSAL CONSIDERATIONS**

WASTE DISPOSAL.....	DISPOSE IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
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**Section 14: TRANSPORT INFORMATION**

PROPER SHIPPING NAME.....	CORROSIVE LIQUID N.O.S. (TRIETHYLENETETRAMINE).
TDG CLASSIFICATION .....	8.
UN NUMBER .....	1760.
PACKING GROUP .....	II.
SPECIAL SHIPPING INSTRUCTIONS ....	N.A.V.

**Section 15: REGULATORY INFORMATION**

CPR COMPLIANCE .....	THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.
WHMIS CLASSIFICATION .....	D1A, D2A, D2B, E.

**Section 16: OTHER INFORMATION**

N.A.P.=NOT APPLICABLE	
N.A.V.=NOT AVAILABLE	
OTHER INFORMATION.....	THE DATA IN THIS MSDS RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED HEREIN AND DOES NOT RELATE TO USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY PROCESS. THIS DATA IS OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS PRODUCT SPECIFICATIONS. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS HEREBY MADE. THE RECOMMENDED INDUSTRIAL HYGIENE AND SAFE HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTENDED USE AND DETERMINE WHETHER THEY ARE APPROPRIATE.



# Tapping Procedure / SOP



9935 Catania Avenue  
Entrance 1 – Suite 200  
Brossard (Quebec) J4Z 3V4  
Canada

**AQUA-PIPE®  
STANDARD OPERATING PROCEDURE  
SERVICE DRILLING PROCEDURE  
(HOT TAP)**

Document Number: APSOP-4.03  
Revision Number: 05  
Supersedes Revision: 04  
Revised: May 1, 2015

**Title: SERVICE DRILLING PROCEDURE (HOT TAP)**

**Preparation, Verification and Approval**

Revised by:	<b>François Campagna, B.A.</b>	Project Manager, Aqua-Pipe®	May 1, 2015
Verified by:	<b>Michael Davison, P. Eng.</b>	Product Director, Aqua-Pipe®	May 1, 2015
Approved by:	<b>Sylvain Boissonneault</b>	General Manager, Aqua-Pipe®	May 1, 2015

**Revision History**

Rev. No.	Date	Comments
00	Feb. 15, 2006	Official release
01	Mar. 1, 2007	Clarification
02	Mar. 1, 2010	Tool specification/supplier
03	Feb. 21, 2011	Tool specification/supplier modifications
04	Mar. 27, 2012	Edition of Special Condition 7.2
05	May 1, 2015	First general revision

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The reader is hereby advised that disclosure of the information to any party is strictly forbidden without the written consent of Sanexen.

*This document is the property of:*

**SANEXEN**  
ENVIRONMENTAL SERVICES INC.



9935 Catania Avenue  
Entrance 1 – Suite 200  
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Canada

AQUA-PIPE®  
STANDARD OPERATING PROCEDURE  
SERVICE DRILLING PROCEDURE  
(HOT TAP)

Document Number: APSOP-4.03  
Revision Number: 05  
Supersedes Revision: 04  
Revised: May 1, 2015

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Canada

**AQUA-PIPE®  
STANDARD OPERATING PROCEDURE  
SERVICE DRILLING PROCEDURE  
(HOT TAP)**

Document Number: APSOP-4.03  
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<b>SERVICE DRILLING PROCEDURE (HOT TAP)</b>	DOCUMENT NO.:	APSOP-4.03
	Doc. Rev.:	05
	REVISION DATE:	2015-05-01

## 1. PURPOSE

This procedure is to define operations that must be conducted to tap a new service connection from 13 mm to 50 mm in diameter ( $\frac{1}{2}$  to 2") on a pipe rehabilitated using Aqua-Pipe®.



### Important Note:

- This procedure covers only tapping of corporation stops that are connected to regular service lines (typically house laterals).

## 2. PLANNING AND SITE PREPARATION

### 2.1 Workpeople

#### 2.1.1 Operators

Two operators are required during process. First will:

- Verify proper operation of equipment;
- Take action on a faulty condition;
- Control Aqua-Tap™ drill speed and angle;
- Shall remain available at all times during execution of this procedure.

Second will:

- Install taping sleeve on rehabilitated pipe;
- Drill opening on lined water main.

All workpeople shall be competent and possess appropriate training, skills and experience.

#### 2.1.2 Operational Safety

##### 2.1.2.1 General Requirements

All workpeople shall be familiar with safety rules and regulations related to activities covered by this procedure. All applicable regulatory requirements shall be strictly observed.

Safety risks are especially related to:

- Working near and in excavated areas;
- Nearby traffic;

*This document is the property of:*

<b>SERVICE DRILLING PROCEDURE (HOT TAP)</b>	DOCUMENT NO.: Doc. Rev.: REVISION DATE:	APSOP-4.03 05 2015-05-01
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- Etc.

## 2.2 Duration

Duration of this activity should be approximately 30 minutes per corporation stop. This duration includes full set-up, maintenance and installation. This evaluation is based on performance and skills of operators who are well-trained and experienced with using Aqua-Tap™ system.

Duration may vary depending on external conditions.

## 2.3 Preparation

At this point Aqua-Pipe® rehabilitated water main is back in service and is delivering pressurized water to homes.

## 3. APPLICABLE DOCUMENTS AND STANDARDS

Following documents shall be used to support this operation.

**TABLE 1: Applicable Documents and Standards**

Title	Description	Purpose
Drilling Machine: <i>User Guide</i>	Document indicating how to use specific drilling machine to tap new corporation stops on pressurized water main.	Basic steps for procedure. Precautions are specific to each model.

Latest revision available shall be used, where applicable.

## 4. MATERIALS

No specific materials are required for this procedure.

## 5. EQUIPMENT AND INSTRUMENTS

### 5.1 Equipment

This operation is performed using a drilling machine, specified to tap a new corporation stop with a saddle. We recommend using Aqua-Tap™ system for best results.

List of required equipment is presented in following table.

*This document is the property of:*

**SANEXEN**  
ENVIRONMENTAL SERVICES INC.

<b>SERVICE DRILLING PROCEDURE (HOT TAP)</b>	DOCUMENT No.:	APSOP-4.03
	Doc. Rev.:	05
	REVISION DATE:	2015-05-01

**TABLE 2: Equipment List**

Equipment	Specification
Hand-Operated Drilling Machine	Aqua-Tap tapping machine basic kit (Part # AT-JR depending on which corporation stop required) available at <a href="http://www.aquatap.com/">http://www.aquatap.com/</a> . (Figure 4.1.1)
Service Saddle	Use appropriate size saddle for rehabilitated water main and desired service diameter.
Shell Cutter	Use appropriate shell cutter (with slots) included in kit. Shell cutter shall be capable of removing a coupon and is essential and singularly recommended, ALWAYS use new or undamaged shell cutters.

#### 5.1.1 Hand-Operated Drilling Machine

Drilling machines MUST BE used at slow speed for optimal results. See above list of equipment for recommended model.



Figure 4.1.1

**TABLE 3: Aqua-Tap JR (AT-JR) Drilling Machine Parts List**

Part Number	Description
AT-D18R	18 V drill
AT-R12	12" (305 mm) drill rod
AT-BK	Coupon retaining pilot bits (4 carbide bits and wire)
AT-H	Housing assembly (including bushing and 4 O-rings)
AT-E	Plug/Coupon ejector
AT-P	Pliers
AT-RC	Carrying case for JR Kit
AT-3/4-C	3/4" (19 mm) CTS adapter
AT-1-C	1" (25 mm) CTS adapter
AT-3/4-I	3/4" (19 mm) IPS adapter
AT-1-I	1" (25 mm) IPS adapter
	Laminated instructions

<b>SERVICE DRILLING PROCEDURE (HOT TAP)</b>	DOCUMENT No.:	APSOP-4.03
	Doc. Rev.:	05
	REVISION DATE:	2015-05-01

### 5.1.2 Service Saddle

Appropriate service saddle for tapping a new service in rehabilitated water main must be used according to following criteria:

- Diameter of rehabilitated pipe;
- Diameter of service connection required;
- Material type of rehabilitated pipe (e.g., cast iron or PVC).

No tapping (threading) of pipe wall is required as corporation stop is threaded into service saddle.

### 5.1.3 Shell Cutters

With every drilling machine, there are different shell cutter diameters. Each size corresponds to a specific corporation stop diameter. Cutter must be new or undamaged for this tapping procedure. Shell cutter shall be capable of retaining plug of material removed from pipe wall (the coupon) and is essential and singularly recommended.



Figure 4.1.2: Shell cutter



#### Important Note:

- Dull or damaged shell cutters can cause severe complications to drilling procedure, such as applying pressure on Aqua-Pipe® causing it to separate from host pipe wall;
- For this reason DO NOT drill a hole with a twist drill or auger bit.

## 5.2 Instruments

A flow meter may be used to measure flow of water exiting newly drilled service connection.

#### Note:

A page break has been inserted here so that Section 6 can occupy completely and solely a specific set of pages.

<b>SERVICE DRILLING PROCEDURE (HOT TAP)</b>	DOCUMENT NO.:	APSOP-4.03
	DOC. REV.:	05
	REVISION DATE:	2015-05-01

## 6. PROCEDURE

### 6.1 Overview

#### 6.1.1 Introduction

Objective of this activity is to tap a new service connection on a rehabilitated pipe while under pressure (hot tap).

Using drilling machine and service saddle, water main shall be drilled without use of a tapping bit. With saddle attached to main, corporation stop is threaded into clamp. Machine is then mounted on corporation stop using an adapter nipple and shell cutter is fed through corporation stop to cut a hole in pipe. Corporation stop shall remain open for most of procedure.

#### 6.1.2 Work Planning

Each service connection diameter requires a specific shell cutter. Information regarding service connection diameters and water main sizes are available from engineering drawings.



#### Important Note:

- Every tool and piece of equipment used must be adapted to size of water main and new service connection to be installed.

### 6.2 General Setup

#### 6.2.1 Installing Saddle

Appropriate saddle must be installed around rehabilitated water main, according to pipe material, where service connection will be drilled.

#### 6.2.2 Installing Shell Cutter

Appropriate shell cutter, as per service connection diameter, shall be installed on drilling machine using appropriate holder and boring bar adapter. Shell cutter must be new or undamaged to ensure proper drilling.

<b>SERVICE DRILLING PROCEDURE (HOT TAP)</b>	<b>DOCUMENT NO.:</b> Doc. Rev.: REVISION DATE:	<b>APSOP-4.03</b> 05 2015-05-01
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### 6.2.3 Initial Positioning of Hand-Operated Drilling Machine

Drilling machine must be installed on saddle and corporation stop at desired location of service connection. Location will be indicated on engineering drawings.

Note:

- It is not possible to give a specific method for initial positioning, as equipment configuration may vary.

## 6.3 Drilling Service Connection

### 6.3.1 Positioning Drilling Machine

ALWAYS follow drilling machine supplier's *User Guide* to set drilling machine in correct position in accordance with city specifications for operation.

### 6.3.2 Drilling Service Connection

At this point, following steps are completed:

- Install saddle at desired location of service connection;
- Install corporation stop on saddle;
- The corporation stop must be in open position;
- Install hand-operated drilling machine on corporation stop, using adapter nipple.

Operator may now begin drilling hole through existing host pipe rehabilitated using Aqua-Pipe® and tap new service connection in place.

Steps:

- Operator should have Aqua-Pipe® *Quick User Guide* (ref. APSOP-4.03-CV) readily available as a step-by-step reminder;
- Operator **slowly** cuts host pipe using drill as per machine's *User Manual* to ensure a clean cut of pipe;
- Use an ANSI/NSF Standard 61 approved lubricant (e.g., IPEX industrial grade pipe thread compound) to facilitate drilling of host pipe;
- Once host pipe is drilled, operator will need to retract shell cutter to remove host pipe coupon before drilling through Aqua-Pipe®;
- Shell cutter will now begin cutting Aqua-Pipe®. Special care shall be taken to ensure that cutter cuts Aqua-Pipe® and does not separate Aqua-Pipe® from host pipe wall;
- Slowly drill until drill rod is inserted in housing assembly to ensure Aqua-Pipe® liner is drilled, take care not to drill too far and damage inside of the Aqua-Pipe® liner;

<b>SERVICE DRILLING PROCEDURE (HOT TAP)</b>	DOCUMENT No.:	APSOP-4.03
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	REVISION DATE:	2015-05-01

- Drill rod of machine is retracted;
- Close corporation stop to prevent pressurized water from exiting;
- Drilling machine is removed;
- Verify that coupon has been removed from pipe;
- Slowly open corporation stop to flush drilling fragments;
- Operator shall verify that Aqua-Pipe® is sufficiently drilled by measuring flow rate of water that exits newly drilled service;
- Flow rate of water exiting corporation stop shall correspond with anticipated flow rate, depending on diameter of drilled hole;
- Service line is attached to corporation stop outlet, which is then opened to activate distribution to residents.



**Important Note:**

- Remember that two different materials are being drilled during this procedure. Therefore, once host pipe is drilled, operator may need to retract shell cutter to remove host pipe coupon before proceeding with drilling through Aqua-Pipe®;
- While drilling new service in place, NEVER exert too much pressure on feed handle so that cutter pushes Aqua-Pipe® during this process. Operator must allow drill to perform work without feeling too much resistance;
- Drilling inner watertight surface of rehabilitated water main (Aqua-Pipe®) is required to ensure proper function of service connection.

#### 6.4 Work Termination

Activities covered by this procedure are completed when following conditions are fully met.

**TABLE 4: Work Termination Conditions**

Condition	Comments
All necessary service connections have been drilled.	-
New service connections are working properly	-

<b>SERVICE DRILLING PROCEDURE (HOT TAP)</b>	DOCUMENT No.:	APSOP-4.03
	Doc. Rev.:	05
	REVISION DATE:	2015-05-01

## 7. ABNORMAL/SPECIAL CONDITIONS AND TROUBLESHOOTING

### 7.1 Service Connections Larger Than 2"

Drilling service connections larger than 50 mm (2") in diameter on a water main rehabilitated using Aqua-Pipe® shall require a larger drilling machine, saddle, and shell cutter. Procedure remains the same.

### 7.2 Excess Pressure Exerted on Liner While Drilling New Service Connection

In this case, lined pipe must be replaced using APSOP-4.02. New main stop shall be tapped to new section of pipe.

## 8. CRITICAL TASKS AND QUALITY CONTROL POINTS

Not applicable.

## 9. RECORDS

Following information must be recorded and maintained to provide evidence of compliance with requirements and quality of installation. Records shall also be checked and approved by competent authority.

TABLE 5: Records

Information	Form	Comments
Action on each rehabilitated pipe	-	- i.e., pipe/service diameter and location

## ► BENEFITS

Aqua-Pipe is a structural trenchless technology exclusively designed for drinking water distribution systems.

Engineers now have more options

- Possibly negative force off the ocean bottom (i.e., lignite, etc.)
- No intrinsic force requirement
- Fully dependent on the ocean bottom to hold it in place
- Effectiveness varies with the bottom material
- Possibly a very large area
- Apparatus is very large and heavy
- Inexpensive but labor intensive to set

מִזְמָרָה שְׁלֵמָה וְעַמְלָה בְּבֵית יְהוָה בְּבֵית הַמִּזְבֵּחַ

- Applied pressure in fire safety
- Consistent reference
- Design and construction

business considerations are the key to success with Agile.

- Based on a cash analysis 20-40% in expenditure for medical care
- Treatment of dental caries
- Preventive treatment and screening visits
- No follow-up appointment of dental caries cases
- Preventive oral care

[www.gguq-pipe.com](http://www.gguq-pipe.com)

Use solutions of sulfur dioxide when compared to traditional combustion methods.

www.aqua-pipe.com

1-800-263-7870

sanexen  
sanexen

### Stability Tests



Do you have breaks or leaks in your water distribution system?

SAVE YOUR  
WATER,  
INSTALL  
A GARDEN  
PIPE

- **Breaker, baffle and leak** with no structural capacity
- 20 to 40% less expensive than traditional pipe replacement
- **Frictionless Technology (FPT)**
- Post-lining replacement of service connections from **100 ft per day**

 low emissions of carbon dioxide when compared to traditional construction methods.

[www.gguu-g Pipe.com](http://www.gguu-g Pipe.com)

Toll free: 1-800-263-7870



Ref.: APSOP-4.03



## Installation Procedure for a Main Stop in a Watermain Rehabilitated using AQUA-PIPE®

### Instructions (Aqua-Tap™ System)

1. Install a pipe saddle and the main stop of the desired diameter in the designated area on the rehabilitated water main.

2. Assemble the drill rod to the housing assembly.



3. Screw the adaptor to the housing assembly of the desired main stop.



4. Attach the desired hole saw to the drill.



5. Apply an ANSI / NSF Standard 61 approved lubricant (ex: IPEX lubricant for PVC pipes) to facilitate the drilling.



6. Join the unit to the main stop (hand tighten only).



7. Attach drill.

8. Ensure that the main stop is open.

9. Drill hole (keep drill setting at low speed and in drill position).



10. Once the hole has been drilled, remove the drill and close the main stop.

11. Unscrew the adaptor and remove drill rod.

12. Remove the hole saw coupon.



13. Redo steps 6-11 to drill the AQUA-PIPE® liner (do not forget to re-open the main stop once the drill rod is re-assembled).

14. Slowly open the main stop to discharge debris; reclose the main stop once all debris has been removed.

15. Connect the service line at the main stop.

16. Open the main stop.

### Instructions to remove coupon :

17. Place the drill in reverse.



18. Grab onto hole saw with pliers.

19. Pull trigger.



20. Remove drill rod from drill and install Ejecting Rod.



21. Install hole saw and place drill in forward position.

22. Grab onto hole saw with pliers.

23. Pull trigger.



# Shoring System



ELEVATION - STACKING UNITS  
SCALE  $1/4" = 1'-0"$

PUN - STRUCTURE UNITS

RS	Address	City	FER-PAL CONSTRUCTION LLC		△
			Phone	Fax	
1	1000 W. 10th Street	Minneapolis	612-871-1000	612-871-1000	11356
2	1000 W. 10th Street	Minneapolis	612-871-1000	612-871-1000	2

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**MUNICIPAL SERVICES COMMITTEE MEETING**  
**AGENDA ITEM SUMMARY SHEET**

AGENDA ITEM DESCRIPTION	COMMITTEE REVIEW
<b>REPORT – Kingery &amp; 63<sup>rd</sup> Street STP Lighting Project Status Update</b>	<input type="checkbox"/> Finance/Administration <input checked="" type="checkbox"/> Municipal Services <input type="checkbox"/> Public Safety  <u>Meeting Date:</u> November 13, 2017

<input checked="" type="checkbox"/> Discussion Only	<input type="checkbox"/> Approval of Staff Recommendation (for consideration by Village Board at a later date)
<input type="checkbox"/> Seeking Feedback	<input type="checkbox"/> Approval of Staff Recommendation (for <u>immediate</u> consideration by Village Board)
<input type="checkbox"/> Regular Report	<input type="checkbox"/> Report/documents requested by Committee

**BACKGROUND**

The Village previously applied for and was awarded grant funding through the Federal Surface Transportation Program (STP) to install both intersection and approach lighting at the Illinois Route 83 (Kingery Highway) and 63<sup>rd</sup> Street intersection. Although Kingery Highway is a state road, the intersection does not meet warrant requirements for lighting. Therefore, our requests over the years for IDOT to install lighting have been denied. Ultimately, it was decided that available grant opportunities to install the improvement would be considered.

The total estimated cost of this project was \$521,730. The grant award will cover 70% of the eligible costs of the project not to exceed \$365,211, with the Village's local share amount being \$156,519. The project was included on IDOT's March 3, 2017 bid letting. The low bidder at that time was H&H Electric Company in the amount of \$345,048.10. Project bids came in significantly lower than expected. The contract was awarded on April 14, 2017 and the contract signed on April 27, 2017. A preconstruction meeting was held on May 16, 2017. It was expected that the project would commence in June of 2017 and be substantially completed by September of 2017. However, at the pre-con meeting, H&H Electric submitted a request for a 120-day time extension for delay of start, which is permissible under IDOT regulations (Article 801.08). Therefore, the start of construction on this project was delayed until October 2017, with a new expected completion date of Spring 2018. However, work did not commence in October. As a result, working days are being charged to the project as of October 10, 2017 (there are 90 work days included for this project). On November 1, 2017, we received notification from H&H that they will try to begin the project the week of November 13th.

Documents attached:

- Bid Tabulations from IDOT's March 3, 2017 bid letting
- IDOT Bid Award Letter to H&H Electric Co., dated April 14, 2017
- IDOT Preconstruction Notice, received May 2, 2017

**REQUEST FOR FEEDBACK (if any)**

**STAFF RECOMMENDATION**

RECEIVED

MAY - 2 2017

VILLAGE OF  
WILLOWBROOK

# Illinois Department of Transportation

## Preconstruction Notice

At the letting held by the Department of Transportation in Springfield on March 3, 2017, the following contractor was the apparent low bidder.

Description of Project: Installation of intersection/transition lighting at the intersection of IL 83 and 63rd Street in Willowbrook.

<u>JURISDICTIONAL TRANSFER:</u> No		<u>Project Labor Agreement:</u> No	
<u>Contractor:</u>	H & H Electric Co.	<u>Cost:</u>	\$ 345,048.10
<u>Contract #:</u>	61D67	<u>Item No.:</u>	111
<u>Area Construction Supervisor:</u>	Mary Ellen Mack 847-705-4465	<u>Route:</u>	FAP 344
<u>Resident Engineer</u>	Baba Owolabi 847-705-4752	<u>Section:</u>	16-00023-00-LT
<u>Design Engineer:</u>	C. Riddle/F. Aqueel	<u>Job No.:</u>	C-91-286-16
<u>EEO Coordinator:</u>	Brenda Washington	<u>Award:</u>	April 14, 2017
		<u>Project:</u>	M-4003(743)
<u>Municipalities</u>	Willowbrook	<u>Est. Start Date:</u>	June 2017
		<u>Est. Compl. Date:</u>	September 2017

Consultant & Others:

The specific details of construction staging will be discussed at a preconstruction meeting between the contractor and the Department on **May 16, 2017 @ 11:00 AM**, at **2nd Floor Construction Conference Room**, Illinois Department of Transportation, 201 W. Center Court, Schaumburg, Illinois 60196-1096. During the construction of the improvement, any questions should be referred to the Area Construction Supervisor.

When completed, this project will improve the operation of the highway facility. We apologize for any inconveniences that may occur.

Any questions regarding construction activities, please feel free to contact our Area Construction Supervisor, Baba Owolabi at 847-705-4752.

ILLINOIS DEPARTMENT OF TRANSPORTATION

Anthony J. Quigley, P.E.  
Region One Engineer



# Illinois Department of Transportation

Office of the Secretary  
2300 South Dirksen Parkway / Springfield, Illinois / 62764  
Telephone 217/782-5597

April 14, 2017

SUBJECT: Item No. 111  
Contract No. 61D67  
DuPage County  
Section 16-00023-00-LT  
Project M-4003(743)  
Route FAP 344  
District 1

RECEIVED

MAY 10 2017

VILLAGE OF  
WILLOWBROOK

H & H Electric Co.  
2830 Commerce Street  
Franklin Park, IL 60131-2927

Dear Contractor:

At the letting held by the Illinois Department of Transportation in Springfield on March 03, 2017, your bid in the amount of \$345,048.10 was the low bid submitted on the above-designated section.

You are hereby awarded the contract for this work at your bid price. Contract and Bond forms will be sent to you under separate cover.

Your attention is called to Illinois Administrative Code, Part 6, Section 6.300, which provides that the Contract shall be executed by the successful bidder and returned together with the Contract Bond within 15 days after the contract has been mailed to the bidder.

Before starting any work, please arrange to discuss your plans for prosecuting this work with Mr. Anthony Quigley, Region One Engineer, 201 West Center Court, Schaumburg, Illinois 60196-1096 or telephone (847) 705-4110. No work may be started on this section until the contract has been executed by the Illinois Department of Transportation.

Sincerely,

A handwritten signature in black ink, appearing to read "Randall S. Blankenhorn".

Randall S. Blankenhorn  
Secretary

ELMSO26:DTGB2389:ELMRO99B

ILLINOIS DEPARTMENT OF TRANSPORTATION

04/27/17 18:34:00 UNIT PRICE TABULATION OF BIDS

LETTING DATE: 03/03/2017 LETTING TYPE: SCHEDULED CONTRACT NUMBER: 61D67

RESPONSIBLE DISTRICT: 01 BIDS LOCKED: Y

SECTION: 16-00023-00-LT ESTIMATE:

STATE JOB NUMBER: C-91-286-16

PROJECT NUMBER: M-4003/743/000

## SUMMARY OF CONTRACTOR BIDS

BIDR NBR	BIDDER NAME	CONTR GROUP	ITEM NBR	COMB GRP	CONTR GROUP	"AS READ" BIDDER EXTENSIONS	SUMMATION OF BIDDER EXTENSIONS	SUMMATION OF CALCULATED EXTENSIONS	LOW BID	BIDR CALC EXTENSION DIFF	BLANK BIDS
1677	Elmund and Nelson Co.	ND ALT				407,901.50	407,901.50	407,901.50	407,901.50		
2475	Hecker and Company, Inc.	NO ALT				434,764.10	434,764.10	434,764.10	434,764.10		
2550	H & H E1lectric Co.	NO ALT				345,048.10 *	345,048.10	345,048.10	345,048.10	*	
2657	Home Towne Electric, Inc.	NO ALT				466,217.50	466,217.50	466,217.50	466,217.50		
3526	Lyons Electric Company, Inc.	NO ALT				547,500.00	547,500.00	547,500.00	547,500.00		
5949	Thorne Electric, Inc.	NO ALT				451,620.40	451,620.40	451,620.40	451,620.40		
6187	Utility Dynamics Corporation	NO ALT				425,485.75	425,485.75	425,485.75	425,485.75		
*** TOTAL GROUP NO ALT PAY ITEMS FOR THIS CONTRACT =											36

RECEIVED

MAY 10 2017

VILLAGE OF  
WILLOWBROOK

ELMS026:DTGB2389:ELMR089B  
 04/27/17 18:34:00 LETTING DATE: 03/03/2017 LETTING TYPE: SCHEDULED  
 RESPONSIBLE DISTRICT: 01 SECTION: 16-00023-00-1T  
 STATE JOB NUMBER: C-91-286-16 PROJECT NUMBER: M-40003/743/000

ILLINOIS DEPARTMENT OF TRANSPORTATION  
 UNIT PRICE T A B U L A T I O N O F BIDS  
 CONTRACT NUMBER: 61067 LETTING ITEM NUMBER: 111

PAGE: 2

COUNTY: DUPAGE  
 MUNICIPALITY: WILLOWBROOK

DETAIL CONTRACTOR BIDS

ITEM NBR	ITEM DESCRIPTION	BIDR NBR	BIDDER NAME	QUANTITY	UNIT OF MEASURE	UNIT PRICE	BIDDER EXTENSION	CALCULATED EXTENSION	BIDR CALC EXTENSION DIFF
<hr/>									
X1400113	LUM LED HM MED WATT	1677	Elmund and Nelson Co.	46.000	EACH	845.0000	38,870.00	38,870.00	
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			762.8000	35,088.80	35,088.80	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			950.0000	43,700.00	43,700.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			721.0000	33,166.00	33,166.00	
20033020	LUM SFTY CABLE ASMBLY	1677	Elmund and Nelson Co.	46.000	EACH	40.0000	1,840.00	1,840.00	
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			106.9000	4,917.40	4,917.40	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			17.5000	805.00	805.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			144.0000	6,624.00	6,624.00	
20076600	TRAIINEES	1677	Elmund and Nelson Co.	500.000	HOUR	0.8000	400.00	400.00	
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			0.8000	400.00	400.00	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			0.8000	400.00	400.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			0.8000	400.00	400.00	
20076604	TRAIINEES TPG	1677	Elmund and Nelson Co.	500.000	HOUR	15.0000	7,500.00	7,500.00	
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			15.0000	7,500.00	7,500.00	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			15.0000	7,500.00	7,500.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			15.0000	7,500.00	7,500.00	
20800150	TRENCH BACKFILL	1677	Elmund and Nelson Co.	5.000	CU YD	50.0000	250.00	250.00	
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			8.4000	42.00	42.00	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			163.0000	815.00	815.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			110.0000	550.00	550.00	



ELMSO26:DTGB2389:ELMRO89B  
 04/27/17 18:34:00 UNIT PRICE TABULATION OF BIDS  
 LETTING DATE: 03/03/2017 LETTING TYPE: SCHEDULED  
 RESPONSIBLE DISTRICT: 01 CONTRACT NUMBER: 61067 LETTING ITEM NUMBER: 111  
 SECTION: 16-00023-00-LT  
 STATE JOB NUMBER: C-91-286-16  
 PROJECT NUMBER: M-4003/743/000

ILLINOIS DEPARTMENT OF TRANSPORTATION  
 COUNTY: DUPAGE  
 MUNICIPALITY: WILLOWBROOK

PAGE: 4

DETAIL CONTRACTOR BIDS

ITEM NBR	ITEM DESCRIPTION	BIDR NBR	BIDDER NAME	QUANTITY	UNIT OF MEASURE	UNIT PRICE	BIDDER EXTENSION	CALCULATED EXTENSION	BIDR CALC EXTENSION DIFF
1677	Elmund and Nelson Co.								
2550	H & H Electric Co.								
2475	Hecker and Company, Inc.								
2657	Home Towne Electric, Inc.								
3526	Lyons Electric Company, Inc.								
5949	Thorne Electric, Inc.								
6187	Utility Dynamics Corporation								
42400200	PC CONC SIDEWALK 5								
1677	Elmund and Nelson Co.	200.000	SQ FT	18.0000		3,600.00		3,600.00	
2550	H & H Electric Co.			11.5000		2,300.00		2,300.00	
2475	Hecker and Company, Inc.			29.0000		5,800.00		5,800.00	
2657	Home Towne Electric, Inc.			5.5000		1,100.00		1,100.00	
3526	Lyons Electric Company, Inc.			5.5000		1,100.00		1,100.00	
5949	Thorne Electric, Inc.			37.0400		7,408.00		7,408.00	
6187	Utility Dynamics Corporation			20.0000		4,000.00		4,000.00	
44000600	SIDEWALK REM								
1677	Elmund and Nelson Co.	200.000	SQ FT	2.0000		400.00		400.00	
2550	H & H Electric Co.			6.5000		1,300.00		1,300.00	
2475	Hecker and Company, Inc.			21.5000		4,300.00		4,300.00	
2657	Home Towne Electric, Inc.			1.1000		220.00		220.00	
3526	Lyons Electric Company, Inc.			1.1000		220.00		220.00	
5949	Thorne Electric, Inc.			18.9900		3,798.00		3,798.00	
6187	Utility Dynamics Corporation			12.6000		2,520.00		2,520.00	
44200970	CL B PATCH T2 10								
1677	Elmund and Nelson Co.	40.000	SQ YD	375.0000		15,000.00		15,000.00	
2550	H & H Electric Co.			96.0000		3,840.00		3,840.00	
2475	Hecker and Company, Inc.			320.0000		12,800.00		12,800.00	
2657	Home Towne Electric, Inc.			707.9000		28,316.00		28,316.00	
3526	Lyons Electric Company, Inc.			707.8500		28,314.00		28,314.00	
5949	Thorne Electric, Inc.			231.1000		9,244.00		9,244.00	
6187	Utility Dynamics Corporation			265.0000		10,600.00		10,600.00	
44201294	CL B PATCH EXPAN JT								
1677	Elmund and Nelson Co.	120.000	FOOT	10.0000		1,200.00		1,200.00	
2550	H & H Electric Co.			2.8000		336.00		336.00	
2475	Hecker and Company, Inc.			13.0000		1,560.00		1,560.00	
2657	Home Towne Electric, Inc.			11.0000		1,320.00		1,320.00	
3526	Lyons Electric Company, Inc.			11.0000		1,320.00		1,320.00	
5949	Thorne Electric, Inc.			5.3400		640.80		640.80	
6187	Utility Dynamics Corporation			36.7500		4,410.00		4,410.00	
44201299	DOWEL BARS 1 1/2								
1677	Elmund and Nelson Co.	100.000	EACH	10.0000		1,000.00		1,000.00	

ELMS026:DTGB2389:ELMRO98  
 04/27/17 18:34:00 LETTING DATE: 03/03/2017 LETTING TYPE: SCHEDULED  
 RESPONSIBLE DISTRICT: 01 SECTION: 16-00023-00-LT  
 STATE JOB NUMBER: C-91-286-16 PROJECT NUMBER: M-4003/743/000

ILLINOIS DEPARTMENT OF TRANSPORTATION  
 UNIT PRICE TABULATION OF BIDS  
 CONTRACT NUMBER: 61D67 LETTING ITEM NUMBER: 111

PAGE: 5

COUNTY: DUPAGE  
 MUNICIPALITY: WILLOMBROOK

DETAIL CONTRACTOR BIDS

ITEM NBR	ITEM DESCRIPTION	BIDR NBR	BIDDER NAME	QUANTITY	UNIT OF MEASURE	UNIT PRICE	BIDDER EXTENSION	CALCULATED EXTENSION	BIDR CALC EXTENSION DIFF
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			2,8000	280.00	280.00	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			17,5000	1,750.00	1,750.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			11,0000	1,100.00	1,100.00	
66900200	NON SPL WASTE DISPOSAL	1677	Elmund and Nelson Co.	5,000	CU YD	250.0000	1,250.00	1,250.00	
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			140.3000	701.50	701.50	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			193.0000	965.00	965.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			359.6000	1,798.00	1,798.00	
66900450	SPL WASTE PLNS/REPORT	1677	Elmund and Nelson Co.	1,000	L SUM	8,500.0000	8,500.00	8,500.00	
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			2,199.4000	2,199.40	2,199.40	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			2,550.0000	2,550.00	2,550.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			1,760.0000	1,760.00	1,760.00	
66900530	SOIL DISPOSAL ANALY	1677	Elmund and Nelson Co.			5,720.0000	5,720.00	5,720.00	
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			9,441.3500	9,441.35	9,441.35	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			5,250.0000	5,250.00	5,250.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			945.0000	945.00	945.00	
70102630	TR CONT & PROT 701601	1677	Elmund and Nelson Co.	1,000	L SUM	350.0000	350.00	350.00	
2550	H & H Electric Co.	2475	Hecker and Company, Inc.			1,390.3000	1,390.30	1,390.30	
2657	Home Towne Electric, Inc.	3526	Lyons Electric Company, Inc.			1,080.0000	1,080.00	1,080.00	
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation			7,650.0000	7,650.00	7,650.00	
70102635	TR CONT & PROT 701701	1677	Elmund and Nelson Co.	1,000	L SUM	350.0000	350.00	350.00	
2550	H & H Electric Co.					1,390.3000	1,390.30	1,390.30	

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## DETAIL CONTRACTOR BIDS

ITEM NBR	ITEM DESCRIPTION	BIDR NBR	BIDDER NAME	QUANTITY	UNIT OF MEASURE	UNIT PRICE	BIDDER EXTENSION	CALCULATED EXTENSION	BIDR CALC EXTENSION DIFF
2475	Hecker and Company, Inc.	1677	Elmund and Nelson Co.	1.080	0.0000	1,080.00	1,080.00	1,080.00	0.00
2657	Home Towne Electric, Inc.	2550	H & H Electric Co.	1.0000	1.00	1.00	1.00	1.00	0.00
3526	Lyons Electric Company, Inc.	2475	Hecker and Company, Inc.	2,937.4700	2,937.47	2,937.47	2,937.47	2,937.47	0.00
5949	Thorne Electric, Inc.	2657	Home Towne Electric, Inc.	9,270.4800	9,270.48	9,270.48	9,270.48	9,270.48	0.00
6187	Utility Dynamics Corporation	3526	Lyons Electric Company, Inc.	9,000.0000	9,000.00	9,000.00	9,000.00	9,000.00	0.00
70102640	TR CONT & PROT 701B01	1677	Elmund and Nelson Co.	1.000	L SUM	350.0000	350.00	350.00	0.00
		2550	H & H Electric Co.	1,390.3000		1,390.30	1,390.30	1,390.30	0.00
		2475	Hecker and Company, Inc.	3,710.0000		3,710.00	3,710.00	3,710.00	0.00
		2657	Home Towne Electric, Inc.	1.0000		1.00	1.00	1.00	0.00
		3526	Lyons Electric Company, Inc.	550.0000		550.00	550.00	550.00	0.00
		5949	Thorne Electric, Inc.	2,660.6100		2,660.61	2,660.61	2,660.61	0.00
		6187	Utility Dynamics Corporation	9,000.0000		9,000.00	9,000.00	9,000.00	0.00
80400100	ELECT SERV INSTALL	1677	Elmund and Nelson Co.	1.000	EACH	1,500.0000	1,500.00	1,500.00	0.00
		2550	H & H Electric Co.	693.0000		693.10	693.10	693.10	0.00
		2475	Hecker and Company, Inc.	1,160.0000		1,160.00	1,160.00	1,160.00	0.00
		2657	Home Towne Electric, Inc.	2,545.0000		2,545.00	2,545.00	2,545.00	0.00
		3526	Lyons Electric Company, Inc.	2,900.0000		2,900.00	2,900.00	2,900.00	0.00
		5949	Thorne Electric, Inc.	939.8400		939.84	939.84	939.84	0.00
		6187	Utility Dynamics Corporation	1,260.0000		1,260.00	1,260.00	1,260.00	0.00
80400200	ELECT UTIL SERV CONN	1677	Elmund and Nelson Co.	1.000	L SUM	2,500.0000	2,500.00	2,500.00	0.00
		2550	H & H Electric Co.	2,500.0000		2,500.00	2,500.00	2,500.00	0.00
		2475	Hecker and Company, Inc.	2,500.0000		2,500.00	2,500.00	2,500.00	0.00
		2657	Home Towne Electric, Inc.	2,500.0000		2,500.00	2,500.00	2,500.00	0.00
		3526	Lyons Electric Company, Inc.	2,500.0000		2,500.00	2,500.00	2,500.00	0.00
		5949	Thorne Electric, Inc.	2,500.0000		2,500.00	2,500.00	2,500.00	0.00
		6187	Utility Dynamics Corporation	2,500.0000		2,500.00	2,500.00	2,500.00	0.00
81028200	UNDGRD C GALVS 2	1677	Elmund and Nelson Co.	40.000	FOOT	15.0000	600.00	600.00	0.00
		2550	H & H Electric Co.	8.8000		352.00	352.00	352.00	0.00
		2475	Hecker and Company, Inc.	18.0000		720.00	720.00	720.00	0.00
		2657	Home Towne Electric, Inc.	26.2000		1,048.00	1,048.00	1,048.00	0.00
		3526	Lyons Electric Company, Inc.	17.3000		692.00	692.00	692.00	0.00
		5949	Thorne Electric, Inc.	20.2100		808.40	808.40	808.40	0.00
		6187	Utility Dynamics Corporation	25.0000		1,000.00	1,000.00	1,000.00	0.00
81028210	UNDGRD C GALVS 2 1/2	1677	Elmund and Nelson Co.	310.000	FOOT	27.0000	8,370.00	8,370.00	0.00
		2550	H & H Electric Co.	15.7000		4,867.00	4,867.00	4,867.00	0.00
		2475	Hecker and Company, Inc.	24.5000		7,595.00	7,595.00	7,595.00	0.00

COUNTY: DUPAGE  
MUNICIPALITY: WILLOWSBROOK

## DETAIL CONTRACTOR BIDS

ITEM NBR	ITEM DESCRIPTION	BIDR NBR	BIDDER NAME	QUANTITY	UNIT OF MEASURE	UNIT PRICE	BIDDER EXTENSION	CALCULATED EXTENSION	BIDR CALC EXTENSION DIFF
2657	Home Towne Electric, Inc.	1677	Elmund and Nelson Co.	30	7000	9,517.00	9,517.00	9,517.00	0.00
3526	Lyons Electric Company, Inc.	2550	H & H Electric Co.	23	1500	7,176.50	7,176.50	7,176.50	0.00
5949	Thorne Electric, Inc.	2475	Hecker and Company, Inc.	38	9890	12,083.80	12,083.80	12,083.80	0.00
6187	Utility Dynamics Corporation	2657	Home Towne Electric, Inc.	18	0000	5,580.00	5,580.00	5,580.00	0.00
81028240	UNDRGRD C GALVS	3526	Lyons Electric Company, Inc.	490.000	FOOT	34.0000	16,660.00	16,660.00	0.00
1677	Elmund and Nelson Co.	5949	Thorne Electric, Inc.			35.7000	17,493.00	17,493.00	0.00
2550	H & H Electric Co.	6187	Utility Dynamics Corporation			30.0000	14,700.00	14,700.00	0.00
2475	Hecker and Company, Inc.	81028730	UNDRGRD C CNC 1 1/4	7,750.000	FOOT	7,7000	59,675.00	59,675.00	0.00
2657	Home Towne Electric, Inc.	1677	Elmund and Nelson Co.			4,2000	32,550.00	32,550.00	0.00
3526	Lyons Electric Company, Inc.	2550	H & H Electric Co.			9,0000	69,750.00	69,750.00	0.00
5949	Thorne Electric, Inc.	2475	Hecker and Company, Inc.			9,8000	75,950.00	75,950.00	0.00
6187	Utility Dynamics Corporation	2657	Home Towne Electric, Inc.			11,7300	90,907.50	90,907.50	0.00
81400730	HANDHOLE C CONC	3526	Lyons Electric Company, Inc.	5.000	EACH	1,400.0000	7,000.00	7,000.00	0.00
1677	Elmund and Nelson Co.	5949	Thorne Electric, Inc.			601,6000	3,008.00	3,008.00	0.00
2550	H & H Electric Co.	6187	Utility Dynamics Corporation			860,0000	4,300.00	4,300.00	0.00
2475	Hecker and Company, Inc.	81702120	EC C XLP USE 1C 8	38,370.000	FOOT	0.4500	17,266.50	17,266.50	0.00
2657	Home Towne Electric, Inc.	1677	Elmund and Nelson Co.			0.3000	11,511.00	11,511.00	0.00
3526	Lyons Electric Company, Inc.	2550	H & H Electric Co.			0.4300	16,499.10	16,499.10	0.00
5949	Thorne Electric, Inc.	2475	Hecker and Company, Inc.			1.0000	38,370.00	38,370.00	0.00
6187	Utility Dynamics Corporation	2657	Home Towne Electric, Inc.			1,6300	62,543.10	62,543.10	0.00
81702150	EC C XLP USE 1C 2	3526	Lyons Electric Company, Inc.	170.000	FOOT	1.1700	44,892.90	44,892.90	0.00
1677	Elmund and Nelson Co.	5949	Thorne Electric, Inc.			0.9500	36,451.50	36,451.50	0.00
2550	H & H Electric Co.	6187	Utility Dynamics Corporation			0.4500	510.00	510.00	0.00
2475	Hecker and Company, Inc.	81702120	EC C XLP USE 1C 2			2.2000	374.00	374.00	0.00
2657	Home Towne Electric, Inc.	1677	Elmund and Nelson Co.			6,5000	1,105.00	1,105.00	0.00
		2550	H & H Electric Co.			2,4000	408.00	408.00	0.00

LETTING DATE: 03/03/2017

LETTING TYPE: SCHEDULED

RESPONSIBLE DISTRICT: 01

SECTION: 16-00023-00-LT

STATE JOB NUMBER: C-91-286-16

PROJECT NUMBER: M-4003/743/000

COUNTRY: DUPAGE

MUNICIPALITY: WILLOWBROOK

## DETAIL CONTRACTOR BIDS

ITEM NBR	ITEM DESCRIPTION	BIDR NBR	BIDDER NAME	QUANTITY	UNIT OF MEASURE	UNIT PRICE	BIDDER EXTENSION	CALCULATED EXTENSION	BIDR CALC EXTENSION DIFF
3526	Lyons Electric Company, Inc.	3526	Lyons Electric Company, Inc.	3.6400		648.80	648.80	648.80	
5949	Thorne Electric, Inc.	2475	Hecker and Company, Inc.	2.6300		447.10	447.10	447.10	
6187	Utility Dynamics Corporation	2657	Home Towne Electric, Inc.	2.2000		374.00	374.00	374.00	
82500335	LIT CONT PEDM 240V100	1677	Elmund and Nelson Co.	1.000	EACH	8,500.0000	8,500.00	8,500.00	
		2550	H & H Electric Co.			26,327.80	26,327.80	26,327.80	
		2475	Hecker and Company, Inc.			8,120.00	8,120.00	8,120.00	
		2657	Home Towne Electric, Inc.			10,172.0000	10,172.00	10,172.00	
		3526	Lyons Electric Company, Inc.			7,532.2200	7,532.22	7,532.22	
		5949	Thorne Electric, Inc.			8,068.0300	8,068.03	8,068.03	
		6187	Utility Dynamics Corporation			7,400.0000	7,400.00	7,400.00	
83050810	LTP A 47.5MH 15MA	1677	Elmund and Nelson Co.	38.000	EACH	3,220.0000	122,360.00	122,360.00	
		2550	H & H Electric Co.			3,029.8000	115,132.40	115,132.40	
		2475	Hecker and Company, Inc.			3,590.0000	136,420.00	136,420.00	
		2657	Home Towne Electric, Inc.			2,991.0000	113,658.00	113,658.00	
		3526	Lyons Electric Company, Inc.			3,210.3500	121,993.30	121,993.30	
		5949	Thorne Electric, Inc.			3,014.7300	114,559.74	114,559.74	
		6187	Utility Dynamics Corporation			2,840.0000	107,920.00	107,920.00	
83050910	LTP A 47.5MH 2-15MA	1677	Elmund and Nelson Co.	4.000	EACH	3,480.0000	13,920.00	13,920.00	
		2550	H & H Electric Co.			3,403.3000	13,613.20	13,613.20	
		2475	Hecker and Company, Inc.			3,920.0000	15,680.00	15,680.00	
		2657	Home Towne Electric, Inc.			3,689.0000	14,756.00	14,756.00	
		3526	Lyons Electric Company, Inc.			4,470.4700	17,881.88	17,881.88	
		5949	Thorne Electric, Inc.			3,248.3400	12,993.36	12,993.36	
		6187	Utility Dynamics Corporation			3,020.0000	12,080.00	12,080.00	
83600365	1P FM 15BC 10" X 8'	1677	Elmund and Nelson Co.	42.000	EACH	1,150.0000	48,300.00	48,300.00	
		2550	H & H Electric Co.			840.4000	35,296.80	35,296.80	
		2475	Hecker and Company, Inc.			1,100.0000	46,200.00	46,200.00	
		2657	Home Towne Electric, Inc.			1,478.0000	62,076.00	62,076.00	
		3526	Lyons Electric Company, Inc.			876.9700	36,832.74	36,832.74	
		5949	Thorne Electric, Inc.			1,037.5800	43,578.36	43,578.36	
		6187	Utility Dynamics Corporation			775.0000	32,550.00	32,550.00	
83800205	SKWY DEV TR B 15BC	1677	Elmund and Nelson Co.	42.000	EACH	400.0000	16,800.00	16,800.00	
		2550	H & H Electric Co.			356.4000	14,968.80	14,968.80	
		2475	Hecker and Company, Inc.			416.0000	17,472.00	17,472.00	
		2657	Home Towne Electric, Inc.			361.0000	15,162.00	15,162.00	
		3526	Lyons Electric Company, Inc.			589.8700	24,774.54	24,774.54	

04/27/17 18:34:00 LETTING DATE: 03/03/2017 LETTING TYPE: SCHEDULED  
 RESPONSIBLE DISTRICT: 01 SECTION: 16-00023-00-LT  
 STATE JOB NUMBER: C-91-286-16 PROJECT NUMBER: M-4003/743/000

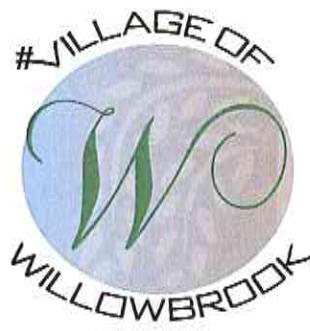
ILLINOIS DEPARTMENT OF TRANSPORTATION  
 UNIT PRICE TA BULATION OF BIDS  
 CONTRACT NUMBER: 61D67 LETTING ITEM NUMBER: 111  
 COUNTY: DUPAGE  
 MUNICIPALITY: WILLOWBROOK

DETAIL CONTRACTOR BIDS

ITEM NBR	ITEM DESCRIPTION	BIDR NBR	BIDDER NAME
5949	Thorne Electric, Inc.	6187	Utility Dynamics Corporation

ITEM NBR	ITEM DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	BIDDER EXTENSION	CALCULATED EXTENSION	BIDR CALC EXTENSION DIFF
5949	Thorne Electric, Inc.	332.1500		13,950.30	13,950.30		
6187	Utility Dynamics Corporation	336.0000		14,112.00	14,112.00		

\* - PAY ITEM UNIT PRICE AND/OR BIDDER TOTAL PRICE WAS OMITTED



EST. 1960

# Willowbrook

835 Midway Drive  
Willowbrook, IL 60527-5549

Phone: (630) 323-8215 Fax: (630) 323-0787 [www.willowbrookil.org](http://www.willowbrookil.org)

Mayor

Frank A. Trilla

Village Clerk

Leroy R. Hansen

Village Trustees

Sue Berglund

Umberto Davi

Terrence Kelly

Michael Mistele

Gayle Neal

Paul Oggerino

Village Administrator

Tim Halik

Chief of Police

Robert J. Pavelchik, Jr.

Director of Finance

Carrie Dittman

MONTHLY REPORT  
MUNICIPAL SERVICES DEPARTMENT  
Permits issued for the month of September, 2017

Asphalt	2
Driveway	1
Demolition, Interior	1
Electric Service, 200 amp	3
Elevator, Freight	1
Fence	1
Flagstone, ROW	1
Foundation	1
Interior Buildout	2
New Single-Family Residence	2
Remodel, Interior	5
Re-Occupancy	1
Roof	2
Security System	2
Sign	4
Temporary Storage, Construction Materials	1
Water Heater Replacement	3
Window/Door Replacement	4
<b>TOTAL</b>	<b>37</b>

Final Certificates of Occupancy	1
Temporary Certificates of Occupancy	1

Permit Revenue for September, 2017	47,252.63
Total Revenue Collected for Fiscal Year	
To Date	241,224.36
Total Budgeted for Fiscal Year 2017/18	245,500.00
Total Percentage of Budgeted Revenue	
Collected to Date	98.26

Respectfully submitted,

Timothy Halik  
Village Administrator

TH/jp



Proud Member of the  
Illinois Route 66 Scenic Byway

Permit	Date Issued:	Name:	Address:	Permit Purpose:	Business Name:	Fee:	RES / COMM:	Date Released:	Date Permit Expires:
17-297+	09/01/17	Anthony Burdi	650 Willowbrook Cntr	Interior Build Out		\$ 4,212.55	C	09/01/17	09/01/18
17-296	09/01/17	Smita Kenkare	319 W. 79th Street	Water Heater		\$ 50.00	R	09/01/17	09/01/18
17-298	09/05/17	Anne Keuhle	735 Plainfield Rd	Temporary Sign	Clover's Greenhouse	\$ 200.00	C	09/01/17	09/01/18
17-214	09/05/17	R. Massengate	600 Joliet Rd Unit H	Interior Build Out	Viscosity Oil	\$ 5,828.79	C	09/05/17	09/05/18
17-215	09/06/17	Dave Mihalk	324 Arabian	New SFR	Pulte	\$ 9,116.89	R	09/06/17	09/06/18
17-303	09/08/17	Gary Garbin	406 Kingswood Court	Flagstone on ROW	Hinsdale Nurseries	\$ 75.00	R	09/08/17	09/08/18
17-294	09/08/17	Eugene Grzynkowicz	840 Plainfield Road	Freight Elevator	Pete's Fresh Market	\$ 600.00	C	09/08/17	09/08/18
17-306	09/11/17	Dorothy Wienczek	77 Lake Hinsdale Dr #313	Kitchen Remodel		\$ 400.00	R	09/11/17	09/11/18
17-305	09/11/17	John Pecora	7601 Kingery Hwy	Interior Demo	Target	\$ 500.00	C	09/11/17	09/11/18
17-304	09/11/17	Lakshmi Honasoge	6353 Bentwood Ln	Windows		\$ 75.00	R	09/11/17	09/11/18
17-307	09/12/17	Harlit Saini	816 73rd Street	200 Amp Svc. Replacement		\$ 90.00	R	09/12/17	09/12/18
17-300	09/12/17	Maureen Reyes	6350 Clarendon Hills Road	Paver Driveway		\$ 75.00	R	09/12/17	09/12/18
17-307	09/13/17	Harlit Saini	6438 Tennessee	200 Amp Electrical Service		\$ 90.00	R	09/12/17	09/11/18
17-309	09/13/17	Amy Li	58 Portwine Rd	200 Amp Electrical Service		\$ 90.00	R	09/13/17	09/11/18
17-310	09/13/17	Carol Marcon	6340 Americana	Asphalt Patching		\$ 75.00	R	09/13/17	09/13/18
17-313	09/14/17	Sherry Stommers	701 Lake Hinsdale Dr	Interior Remodel		\$ 325.00	R	09/14/17	09/14/18
17-312	09/14/17	Michael Jakubek	267 Weather Hill Drive	Water Heater		\$ 50.00	R	09/14/17	09/14/18
17-285	09/18/17	Nancy Huber	30 Kyle Court	New Windows/Doors		\$ 75.00	R	09/18/17	09/18/18
17-236	09/18/17	Steve Mihalk	323 Palomino Trail	New SFR	Pulte	\$ 8,642.82	R	09/18/17	09/18/18
17-316	09/18/17	Susan Stoneypher	12 Lakeview Court	New Windows/Doors		\$ 75.00	R	09/18/17	09/18/18
17-315	09/18/17	Manio Magliano	635 W. Joliet Rd	On Site Rock Storage	Compass	\$ 500.00	C	09/17/17	09/17/18
17-319	09/19/17	Saber Damra	825 W. 75th Street	Re-occupancy	Willowbrook Trucking	\$ 200.00	C	09/18/17	09/18/18
17-321	09/19/17	Keeley	525 Executive Drive	Foundation	Midwest Helicopter	\$ 7,379.17	C	09/19/17	09/19/18
17-287	09/21/17	Lisa Neal	535 Executive Road	Sign	Shell	\$ 736.75	C	09/21/17	09/21/18
17-317	09/21/07	Richard Pabst	324 Chatelaine Ct	Water Heater		\$ 50.00	R	09/21/17	09/21/18
17-226	09/22/17	Norine Clement	530 Executive Drive	Security System	ADW Partnership	\$ 100.00	C	09/22/17	09/22/18
17-324	09/22/17	Jean Pagia	6348 Tennessee	Bath Remodel		\$ 355.00	R	09/22/17	09/22/18
17-325	09/25/17	Kyle Donghue	6510 Bentley	Roof		\$ 35.00	R	09/25/17	09/25/18
17-328	09/26/17	June Mertenkov	240 Somerset Rd	Roof		\$ 35.00	R	09/26/17	09/26/18
17-326	09/26/17	Tom Kingston	7630 Quincy Street	Sealcoating	OEC	\$ 75.00	C	09/26/17	09/26/18
17-318	09/26/17	Denise Worden	315 60th Street	Roof		\$ 35.00	R	09/26/17	09/26/18
17-308	09/27/17	Norine Clement	600 Joliet Rd Suite H	Security System	Viscosity Oil	\$ 100.00	C	09/27/17	09/27/18
17-234	09/27/17	Tim Regan	7601 S. Kingery	Interior Remodel	Target	\$ 5,120.75	C	09/27/17	09/27/18
17-320	09/28/17	Matthew Omen	6336 Martin Drive	Patio Door		\$ 75.00	R	09/28/17	09/28/18
17-327	09/28/17	Elyne Lofthouse	540 Ridgemoor	Fence		\$50	R	09/28/17	09/28/18
16-431	09/29/17	Dan Smith	7510 Madison Street	Sign	Morgan Harbour	\$ 658.19	C	09/29/17	09/29/18
17-329	09/29/17	Holland Design	820 Plainfield Rd	Sign	Pete's Fresh Market	\$ 6,405.80	C	09/29/17	09/29/18

MUNICIPAL SERVICES DEPARTMENT

PERMIT REVENUE

Fiscal Year 2017/18

MONTH	CURRENT FISCAL YEAR		PRIOR FISCAL YEAR	
	2017/18		2016/17	
MAY	\$	74,721.15	\$	28,379.31
JUNE	\$	18,289.54	\$	13,426.64
JULY	\$	35,679.59	\$	19,166.25
AUGUST	\$	65,281.45	\$	59,753.64
SEPTEMBER	\$	47,252.63	\$	62,997.75
OCTOBER			\$	132,950.27
NOVEMBER			\$	74,028.63
DECEMBER			\$	9,337.62
JANUARY			\$	40,260.12
FEBRUARY			\$	25,544.07
MARCH			\$	16,810.28
APRIL			\$	16,072.18
COLLECTED REVENUE	\$	241,224.36	\$	498,726.76
BUDGETED REVENUE	\$	245,500.00	\$	232,500.00
REVENUES COLLECTED- (OVER)/UNDER BUDGET	\$	4,275.64	\$	(266,226.76)
PERCENTAGE OF BUDGETED REVENUE COLLECTED		98.26%		214.51%

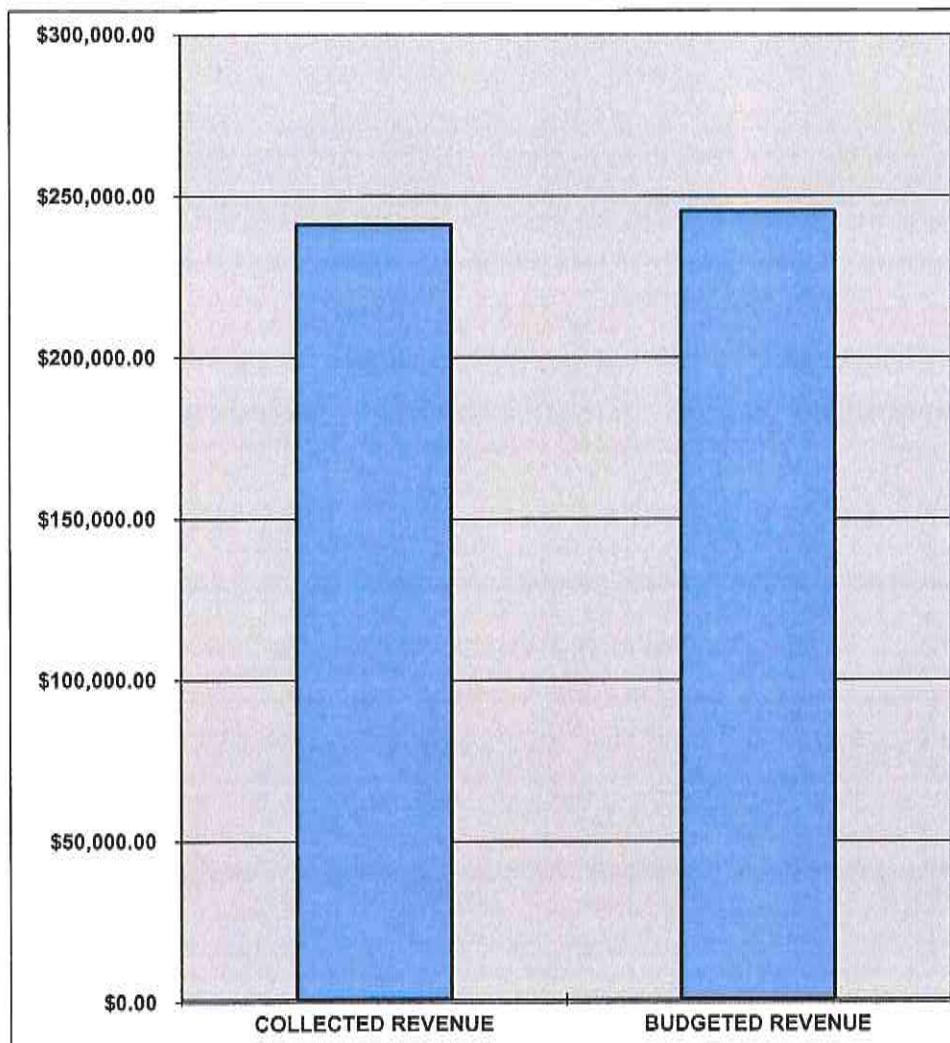
MUNICIPAL SERVICES DEPARTMENT

PERMIT REVENUE

	Fiscal Year 17/18	Fiscal Year 16/17
COLLECTED REVENUE	\$ 241,224.36	\$ 498,726.76
BUDGETED REVENUE	\$ 245,500.00	\$ 232,500.00

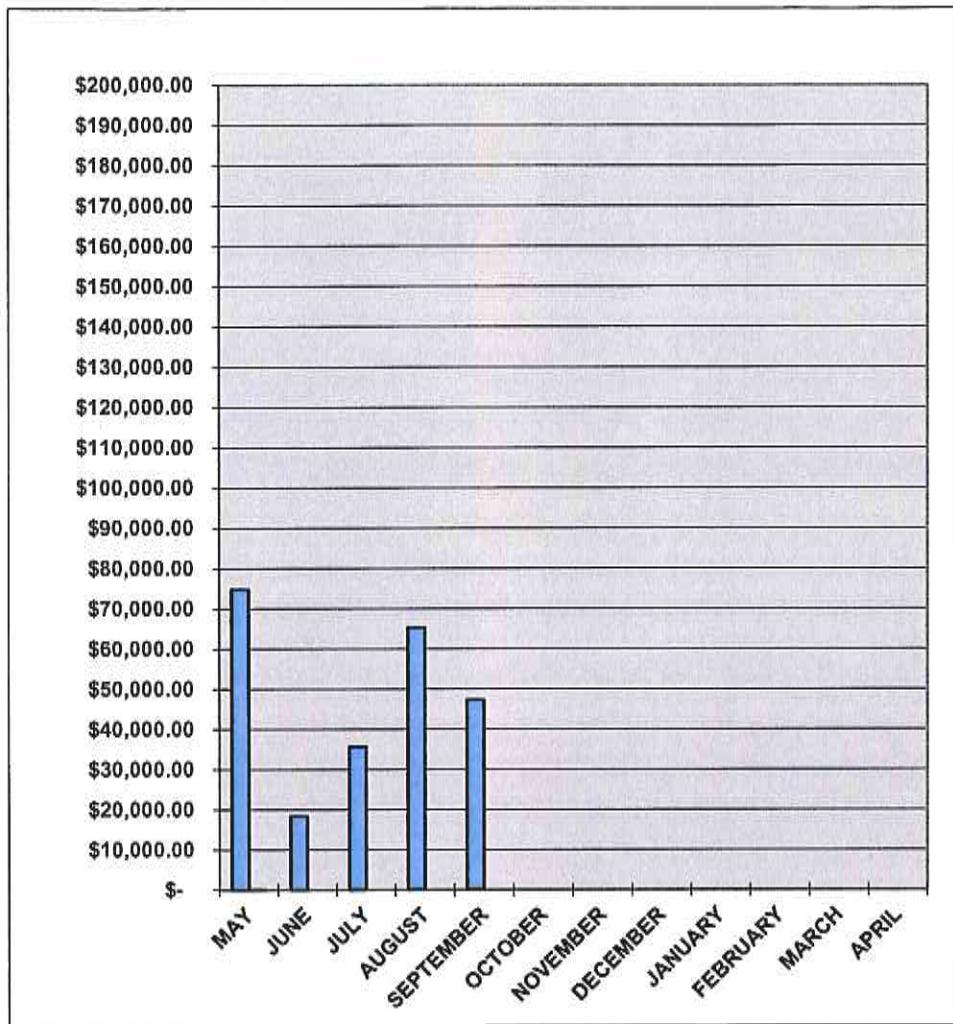
MUNICIPAL SERVICES DEPARTMENT

PERMIT REVENUE



## MUNICIPAL SERVICES DEPARTMENT

### PERMIT REVENUE



Date	JNL	Type	Description	Reference #	Debits	Credits	Balance
<b>Fund 01 GENERAL FUND</b>							
09/01/2017			<b>01-00-310-401 BUILDING PERMITS</b>		<b>BEG. BALANCE</b>		<b>(187,400.52)</b>
09/01/2017	CR	RCPT	Building Dept. Invoice 09/01/2017		4,337.55		(191,738.07)
09/05/2017	CR	RCPT	Building Dept. Invoice 09/05/2017		6,028.79		(197,766.86)
09/06/2017	CR	RCPT	Building Dept. Invoice 09/06/2017		7,969.85		(205,736.71)
09/08/2017	CR	RCPT	Building Dept. Invoice 09/08/2017		600.00		(206,336.71)
09/08/2017	CR	RCPT	Building Dept. Invoice 09/08/2017		75.00		(206,411.71)
09/11/2017	CR	RCPT	Building Dept. Invoice 09/11/2017		545.00		(206,956.71)
09/11/2017	CR	RCPT	Building Dept. Invoice 09/11/2017		500.00		(207,456.71)
09/12/2017	CR	RCPT	Building Dept. Invoice 09/12/2017		165.00		(207,621.71)
09/13/2017	CR	RCPT	Building Dept. Invoice 09/13/2017		165.00		(207,786.71)
09/14/2017	CR	RCPT	Building Dept. Invoice 09/14/2017		325.00		(208,111.71)
09/14/2017	CR	RCPT	Building Dept. Invoice 09/14/2017		50.00		(208,161.71)
09/18/2017	CR	RCPT	Building Dept. Invoice 09/18/2017		8,070.78		(216,232.49)
09/18/2017	CR	RCPT	Building Dept. Invoice 09/18/2017		75.00		(216,307.49)
09/19/2017	CR	RCPT	Building Dept. Invoice 09/19/2017		7,579.17		(223,886.66)
09/20/2017	CR	RCPT	Building Dept. Invoice 09/20/2017		750.00		(224,636.66)
09/21/2017	CR	RCPT	Building Dept. Invoice 09/21/2017		250.00		(224,886.66)
09/25/2017	CR	RCPT	Building Dept. Invoice 09/25/2017		355.00		(225,241.66)
09/25/2017	BD	TRX	SUMMARY BD 09/25/2017		200.00		(225,441.66)
09/26/2017	CR	RCPT	Building Dept. Invoice 09/26/2017		105.00		(225,546.66)
09/26/2017	CR	RCPT	Building Dept. Invoice 09/26/2017		75.00		(225,621.66)
09/27/2017	CR	RCPT	Building Dept. Invoice 09/27/2017		1,120.75		(226,742.41)
09/28/2017	CR	RCPT	Building Dept. Invoice 09/28/2017		75.00		(226,817.41)
09/29/2017	CR	RCPT	Building Dept. Invoice 09/29/2017		435.00		(227,252.41)
09/29/2017	CR	RCPT	Building Dept. Invoice 09/29/2017		50.00		(227,302.41)
09/30/2017			<b>01-00-310-401</b>	<b>END BALANCE</b>	<b>0.00</b>	<b>39,901.89</b>	<b>(227,302.41)</b>

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DB: Willowbrook

GL ACTIVITY REPORT FOR WILLOWBROOK  
FROM 01-00-310-402 TO 01-00-310-402  
TRANSACTIONS FROM 09/01/2017 TO 09/30/2017

Page:

1/1

Date	JNL	Type	Description	Reference #	Debits	Credits	Balance
Fund 01 GENERAL FUND							
09/01/2017			01-00-310-402 SIGN PERMITS			BEG. BALANCE	(4,637.21)
09/20/2017	CR	RCPT	Building Dept. Invoice 09/20/2017		50.00		(4,687.21)
09/21/2017	CR	RCPT	Building Dept. Invoice 09/21/2017		636.75		(5,323.96)
09/29/2017	CR	RCPT	Building Dept. Invoice 09/29/2017		6,663.99		(11,987.95)
09/30/2017			01-00-310-402	END BALANCE	0.00	7,350.74	(11,987.95)



EST. 1960

# Willowbrook

835 Midway Drive  
Willowbrook, IL 60527-5549

Phone: (630) 323-8215 Fax: (630) 323-0787 [www.willowbrookil.org](http://www.willowbrookil.org)

## MONTHLY REPORT

### MUNICIPAL SERVICES DEPARTMENT

Permits issued for the month of October, 2017

#### Mayor

Frank A. Trilla

Asphalt	2
Bath tub installation	1
Concrete	3
Condo Remodel	1
Door Replacement	2
Driveway	1
Elevator Installation	1
EO Storage Shed	1
Fence	3
Fiber Optic Cable	1
Kitchen Remodel	2
Mass Grading	1
Misc. Electric	1
New Commercial Construction	1
Pallet Racking	1
Parking Lot Repairs	1
Patio Door	2
Pool w/Patio	1
Re-occupancy	2
Roof	17
Sealcoat	2
Sewer Line Repair	1
SFR	1
Shed	1
Sidewalk Repair	2
U/G Bore	1
Water Heater	1
Window/Door	7
<b>TOTAL</b>	<b>37</b>

#### Chief of Police

Robert J. Pavelchik, Jr.

#### Director of Finance

Carrie Dittman

Final Certificates of Occupancy	4
Temporary Certificates of Occupancy	0
<b>Permit Revenue for October, 2017</b>	<b>60,248.25</b>
<b>Total Revenue Collected for Fiscal Year</b>	
To Date	301,472.61
Total Budgeted for Fiscal Year 2017/18	245,500.00
Total Percentage of Budgeted Revenue	
Collected to Date	122.79

Respectfully submitted,

Timothy Halik  
Village Administrator

TH/jp



Proud Member of the  
Illinois Route 66 Scenic Byway

## MUNICIPAL SERVICES DEPARTMENT

## PERMIT REVENUE

Fiscal Year 2017/18

MONTH	CURRENT FISCAL YEAR 2017/18		PRIOR FISCAL YEAR 2016/17	
MAY	\$	74,721.15	\$	28,379.31
JUNE	\$	18,289.54	\$	13,426.64
JULY	\$	35,679.59	\$	19,166.25
AUGUST	\$	65,281.45	\$	59,753.64
SEPTEMBER	\$	47,252.63	\$	62,997.75
OCTOBER	\$	60,248.25	\$	132,950.27
NOVEMBER			\$	74,028.63
DECEMBER			\$	9,337.62
JANUARY			\$	40,260.12
FEBRUARY			\$	25,544.07
MARCH			\$	16,810.28
APRIL			\$	16,072.18
COLLECTED REVENUE	\$	301,472.61	\$	498,726.76
BUDGETED REVENUE	\$	245,500.00	\$	232,500.00
REVENUES COLLECTED- (OVER)/UNDER BUDGET	\$	(55,972.61)	\$	(266,226.76)
PERCENTAGE OF BUDGETED REVENUE COLLECTED		122.80%		214.51%

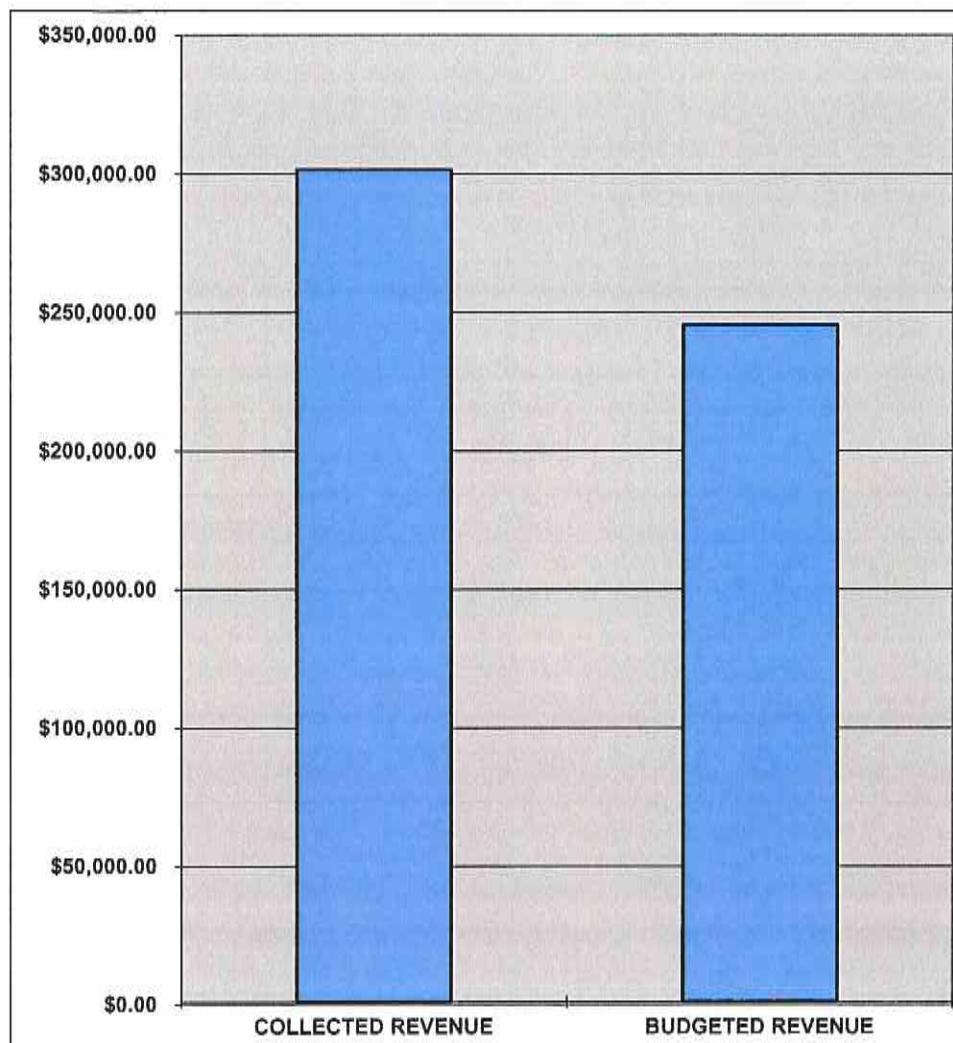
MUNICIPAL SERVICES DEPARTMENT

PERMIT REVENUE

	Fiscal Year 17/18	Fiscal Year 16/17
COLLECTED REVENUE	\$ 301,472.61	\$ 498,726.76
BUDGETED REVENUE	\$ 245,500.00	\$ 232,500.00

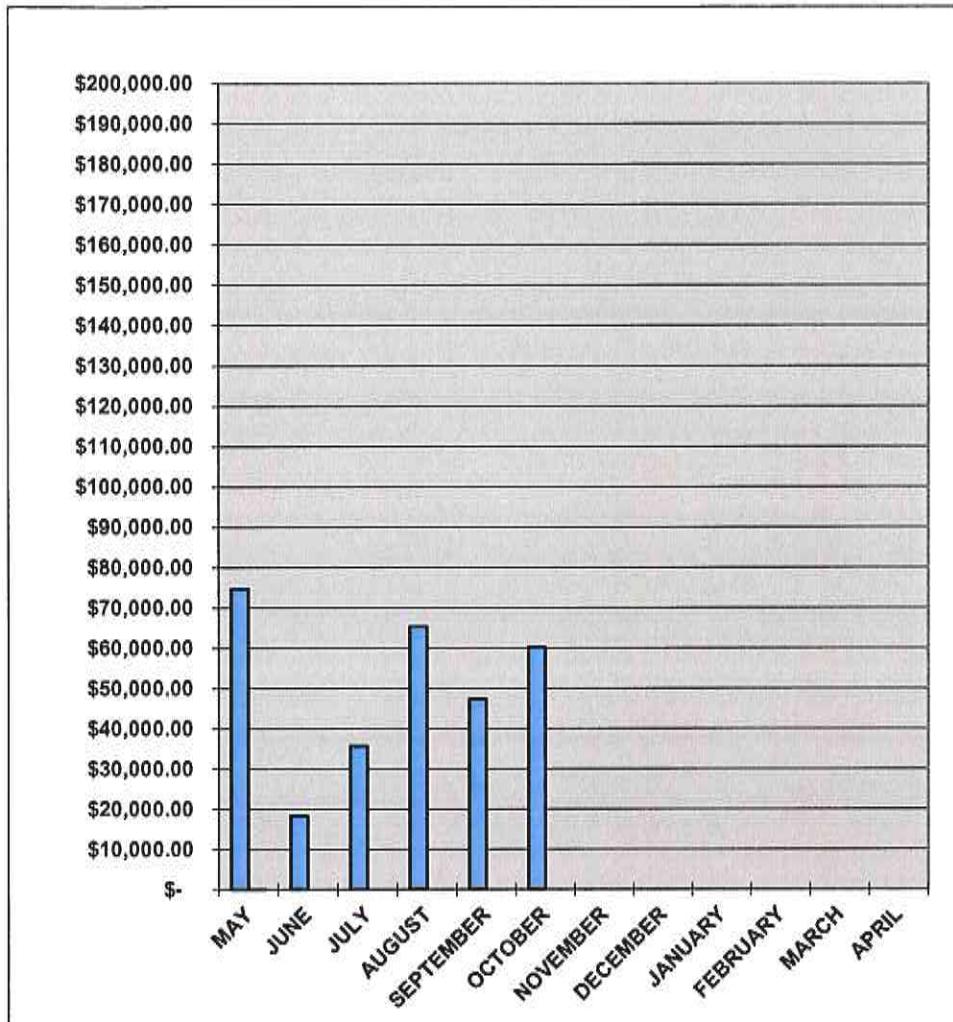
MUNICIPAL SERVICES DEPARTMENT

PERMIT REVENUE



## MUNICIPAL SERVICES DEPARTMENT

### PERMIT REVENUE



Permit Number	Date Issued:	Name:	Address:	Permit Purpose:	Business Name:	Fee:	RES / COMM:	Date Released:	Date Permit Expires:	Valuation:
17-339	10/02/17	Sean O'Brian	1 Clubhouse Circle	Asphalt	Lake Hinsdale Village	\$ 250.00	R	10/02/17	10/02/18	
17-349	10/06/17	R. Massengale	5001600 Juliet Road	Asphalt-sealcoating/striping	Willowbrook Center	\$ 125.00	C	10/06/17	10/06/18	\$ 48,472.00
17-358	10/12/17	Nicole Rusy	6325 Clarendon Hills Rd	Bath tub installation		\$ 50.00	R	10/12/17	10/12/18	\$ 1,450.00
17-331	10/04/17	Ferdinando Traversa	5826 Bentley	Concrete Patio		\$ 50.00	C	10/04/17	10/04/18	
17-386	10/25/17	Victor Galati	1 Clubhouse Drive	Concrete-Phase 1		\$ 575.00	R	10/25/17	10/25/18	\$ 375,000.00
17-367	10/13/17	Jeff Taylor	201 Lake Hinsdale Drive	Condo Remodel		\$ 400.00	R	10/13/17	10/13/18	
17-369	10/18/17	Cathy Gotsch	646 67th Place	Door		\$ 75.00	R	10/18/17	10/18/18	
17-391	10/30/17	Natasha Manasowska	6111 Knollwood Rd #103	Door		\$ 75.00	R	10/30/17	10/30/18	\$ 3,800.00
17-345	10/03/17	Michael Padak	605 63rd Street	Driveway		\$ 75.00	R	10/03/17	10/03/18	
17-333	10/25/17	Sandra Rosario	6340 Americana Drive	Elevator Installation		\$ 1,489.50	C	10/19/17	10/19/18	
17-371	10/19/17	Alex Polino	7775 S. Quincy	EO Storage Shed	Sterigenics	\$ 50.00	R	10/04/17	10/04/18	
17-344	10/04/17	Lauren Woerz	6435 Bentley	Fence		\$ 50.00	R	10/17/17	10/17/18	
17-364	10/17/17	Jim Buonavolanto	6407 Lane Court	Fence		\$ 100.00	C	10/19/17	10/19/18	
17-354	10/19/17	Alex Polino	7775 S. Quincy	Fence	Sterigenics	\$ 1,225.00	C	10/09/17	10/09/18	
17-032	10/09/17	Rhonda Hill	6300 Bentley Ave	Fiber Optic Cable Instal		\$ 500.39	R	10/04/17	10/04/18	
17-335	10/04/17	Brian Kennedy	7911 Brookbank	Kitchen Remodel		\$ 538.10	R	10/12/17	10/12/18	\$ 8,500.00
17-360	10/12/17	Kris Srinivasan	6340 Americana Dr	Kitchen Remodel		\$ 100.00	C	10/12/17	10/12/18	
17-356	10/12/17	George Rechits	7775 S. Quincy	Low Voltage Alarm	Sterigenics	\$ 6,550.00	C	10/11/17	10/11/18	
17-353	10/11/17	Mario Magliano	6225 Joliet Rd	Mass Grading	Compass Arena	\$ 175.00	R	10/27/17	10/27/18	
17-393	10/27/17	Jean Kolessar	301 Lake Hinsdale Dr	Misc Electrical		\$ 37,856.13	C	10/25/17	10/25/18	\$ 2,200,000.00
17-256	10/25/17	Keeley	525 Executive Drive	New Commercial Constr	MidWest Helicopter	\$ 380.00	C	10/30/17	10/30/18	\$ 98,000.00
16-477	10/30/17	Jim Hamond	7775 S. Quincy St	Pallet Racking	Sterigenics	\$ 300.00	C	10/26/17	10/26/18	\$ 31,500.00
17-377	10/26/17	Mike Murphy	6900 Kingery	Parking lot repairs	Citgo	\$ 75.00	R	10/03/17	10/03/18	\$ 3,746.00
17-334	10/03/17	Teresa Vuko	6156 Knollway Drive	Patio Door		\$ 75.00	R	10/17/17	10/17/18	\$ 3,400.00
17-370	10/17/17	Muhammad Ali	222 Waterford Court	Patio Doors		\$ 1,258.75	R	09/29/17	09/29/18	\$ 36,900.00
17-363	10/17/17	Jim Buonavolanto	6407 Lane Court	Pool w/Patio		\$ 200.00	C	10/06/17	10/06/18	\$ 12,350.00
17-347	10/06/17	Keith Zagroba	7510 S. Madison	R/R Concrete	Morgan Harbor	\$ 300.00	C	10/12/17	10/12/18	
17-366	10/12/17	Jill Bonfiglio	7630 Plaza Court	Re-occupancy	Beyond Wireless	\$ 200.00	C	10/27/17	10/27/18	
17-389	10/27/17	David Friedman	621 Plainfield Rd	Re-Occupancy	Off-Site Building Servic	\$ 200.00	C	10/03/17	10/03/18	\$ 5,650.00
17-301	09/29/17	Matt Duddy	5850 Virginia Ave	Roof		\$ 35.00	R	10/06/17	10/06/18	\$ 8,100.00
17-338	10/02/17	David Froberg	14-30 63rd Street	Roof	Willowbrook Square	\$ 200.00	C	10/02/17	10/02/18	
17-332	10/02/17	David Froberg	82-102 63rd Street	Roof	Willowbrook Square	\$ 200.00	C	10/02/17	10/02/18	
17-341	10/03/17	Sally Balle	7631 Appletree	Roof		\$ 35.00	R	10/03/17	10/03/18	
17-346	10/06/17	Dan Jones	7910 Joliet	Roof	House of Trucks	\$ 200.00	C	10/06/17	10/06/18	
17-352	10/06/17	Kyle Donaghue	6519 Bentley Ave	Roof		\$ 35.00	R	10/06/17	10/06/18	\$ 13,688.12
17-133	10/09/17	Marilyn Johnson	6533 Bentley	Roof		\$ 35.00	R	10/09/17	10/09/18	\$ 23,570.18
17-340	10/11/17	David Honof	343 59th Street	Roof		\$ 35.00	R	10/11/17	10/11/18	\$ 3,000.00
17-342	10/16/17	Austria Bioviescience	7802 Brookbank Rd	Roof		\$ 35.00	R	10/16/17	10/16/18	
17-365	10/16/17	MaryKay Colletti	7628 Appleton Ln	Roof		\$ 35.00	R	10/16/17	10/16/18	\$ 8,850.00
17-375	10/19/17	Matt Makowski	535 68th Street	Roof		\$ 35.00	R	10/19/17	10/19/18	\$ 5,000.00
17-379	10/19/17	Kyle Donaghue	840 Ridgemoor Drive	Roof		\$ 35.00	R	10/19/17	10/19/18	\$ 10,953.17
17-380	10/19/17	Kyle Donaghue	6507 Quincy Street	Roof		\$ 35.00	R	10/19/17	10/19/18	\$ 13,698.07
17-387	10/25/17	Steve Dillon	44 Garfield Court	Roof		\$ 35.00	R	10/25/17	10/25/18	\$ 9,500.00
17-392	10/26/17	Caryn Verdun	7706 Chiey Tree Ln	Roof		\$ 35.00	R	10/26/17	10/26/18	\$ 10,000.00
17-355	10/30/17	Winnie Jumao AS	6709 Shefield	Roof		\$ 35.00	R	10/30/17	10/30/18	\$ 6,548.00
17-384	10/27/17	Tim Kaczmarek	6349 Tennessee	Roof and Skylights		\$ 35.00	R	10/27/17	10/27/18	\$ 31,062.00
17-378	10/19/17	Mike Murphy	6920 Kingery	Sealcoat/striping	Binny's	\$ 300.00	C	10/19/17	10/19/18	\$ 31,500.00
17-376	10/19/17	Mike Murphy	7825 S. Quincy	Sealcoat/striping	Korman-Lederer	\$ 300.00	C	10/19/17	10/19/18	\$ 19,000.00

Permit	Date Issued:	Name:	Address:	Permit Purpose:	Business Name:	Fee:	RES / COMM:	Date Released:	Date Permit Expires:	Valuation:
17-362	10/12/17	Gregory Hendricks	7810 Virginia Ct	Sewer Line Repair		\$ 50.00	R	10/12/17	10/12/18	\$ 1,000.00
17-275	10/26/17	Dave Mihalik	6540 Arabian Circle	SFR	Pulte	\$ 8,540.07	R	10/26/17	10/26/18	\$ 732,239.00
17-388	10/26/17	Ron Wallin	7118 73rd Court	Shed		\$ 40.00	R	10/26/17	10/26/18	
17-359	10/19/17	Michael Spencer	71185 Kingery	Sidewalk-R/R	Willowbrook Town Ctr	\$ 100.00	C	10/19/17	10/19/18	
17-382	10/20/17	Tony Harris	7440 Tennessee Drive	Sidewalk-replace	Willowbrook Apts	\$ 75.00	R	10/20/17	10/20/18	
17-351	10/06/17	Richard Kopec	7830 S. Quincy	U/G Bore	Willowbrook Plaza	\$ -	C	10/06/17	10/06/18	
17-372	10/16/17	Daniel Niccolai	342 Sheridan Drive #1A	Water Heater		\$ 50.00	R	10/16/17	10/16/18	
17-367	10/20/17	Gregg Zinn	2115 63rd Street	Window Addition	Midtown Athletic Club	\$ 100.00	C	10/20/17	10/20/18	
17-368	10/13/17	John Hauger	7820 Sugartbush	Window Replacement		\$ 75.00	R	10/13/17	10/13/18	
17-383	10/24/17	Tom Fong	425 Stonegate Ct	Window Replacement		\$ 75.00	R	10/24/17	10/20/18	
17-373	10/18/17	Tom Drake	6178 Knoll Lane Court	Window/door		\$ 75.00	R	10/18/17	10/18/18	\$ 6,000.00
17-361	10/18/17	Susan Williams	258 Brookside Lane Unit A	Window/door		\$ 75.00	R	10/18/17	10/18/18	\$ 8,544.00
17-350	10/11/17	Theodore Popielarski	6006 Western Ave	Windows		\$ 75.00	R	10/11/17	10/11/18	\$ 2,511.00
17-314	10/11/17	Marko Pajetaak	7555 Ariene Ave	Windows, doors		\$ 75.00	R	10/11/17	10/11/18	\$ 28,500.00



**VILLAGE OF WILLOWBROOK - PUMPAGE REPORT**  
**TOTAL GALLONS PUMPED**  
**FY 2002/03 - FY 2017/18**

Month	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
May	32,267,000	33,518,000	35,018,000	35,919,000	35,162,000	36,696,000	33,890,000	31,322,000	31,715,000	30,725,000	34,220,000	30,860,000	29,547,000	29,213,000	31,048,000	28,681,000
June	38,911,000	38,691,000	35,447,000	48,511,000	42,471,000	43,700,000	33,817,000	32,087,000	31,799,000	32,620,000	44,635,000	31,512,000	32,193,000	29,447,000	34,451,000	33,573,000
July	52,100,000	39,116,000	41,248,000	52,479,000	43,279,000	44,574,000	41,463,000	36,819,000	38,513,000	41,371,000	49,498,000	39,106,000	33,122,000	32,813,000	34,898,000	34,333,000
August	44,167,000	40,433,000	41,059,000	47,861,000	41,114,000	38,778,000	43,017,000	38,516,000	38,745,000	35,639,000	40,272,000	41,448,000	32,796,000	36,985,000	32,739,000	33,061,000
September	40,838,000	36,275,000	39,658,000	43,906,000	32,998,000	42,013,000	33,418,000	34,331,000	33,992,000	32,273,000	33,657,000	35,737,000	31,869,000	32,623,000	30,853,000	33,220,000
October	33,128,000	31,667,000	33,765,000	35,009,000	31,937,000	34,612,000	30,203,000	28,919,000	33,789,000	29,892,000	30,283,000	29,226,000	28,728,000	30,690,000	27,589,000	
November	28,560,000	28,260,000	30,106,000	29,515,000	29,153,000	29,847,000	28,054,000	26,857,000	28,125,000	27,138,000	27,535,000	28,446,000	25,364,000	26,585,000	25,929,000	
December	30,503,000	29,133,000	32,786,000	31,086,000	30,102,000	31,435,000	29,568,000	28,931,000	29,257,000	28,643,000	27,863,000	29,847,000	26,710,000	27,194,000	26,581,000	
January	30,343,000	29,602,000	31,223,000	29,411,000	30,340,000	32,444,000	29,383,000	28,123,000	28,401,000	28,846,000	28,427,000	31,265,000	28,505,000	27,915,000	26,165,000	
February	27,216,000	28,755,000	26,768,000	27,510,000	29,078,000	29,470,000	26,629,000	25,005,000	24,988,000	26,635,000	24,308,000	29,230,000	25,484,000	26,048,000	22,962,000	
March	29,488,000	30,315,000	30,025,000	29,905,000	30,362,000	31,094,000	28,408,000	27,945,000	27,909,000	28,911,000	27,862,000	29,917,000	28,779,000	26,552,000	25,855,000	
April	29,845,000	29,350,000	29,478,000	30,452,000	29,468,000	30,239,000	27,193,000	27,793,000	27,145,000	34,220,000	27,514,000	28,101,000	25,255,000	26,791,000	24,720,000	
<b>TOTAL</b>	<b>417,366,000</b>	<b>395,115,000</b>	<b>406,581,000</b>	<b>441,564,000</b>	<b>405,464,000</b>	<b>424,902,000</b>	<b>385,043,000</b>	<b>366,648,000</b>	<b>374,378,000</b>	<b>376,913,000</b>	<b>396,074,000</b>	<b>384,695,000</b>	<b>348,352,000</b>	<b>352,856,000</b>	<b>343,790,000</b>	<b>162,868,000</b>

YEAR TO DATE LAST YEAR (gallons): 163,989,000

YEAR TO DATE THIS YEAR (gallons): 162,668,000

DIFFERENCE (gallons): -1,121,000

PERCENTAGE DIFFERENCE (+/-): -0.68%

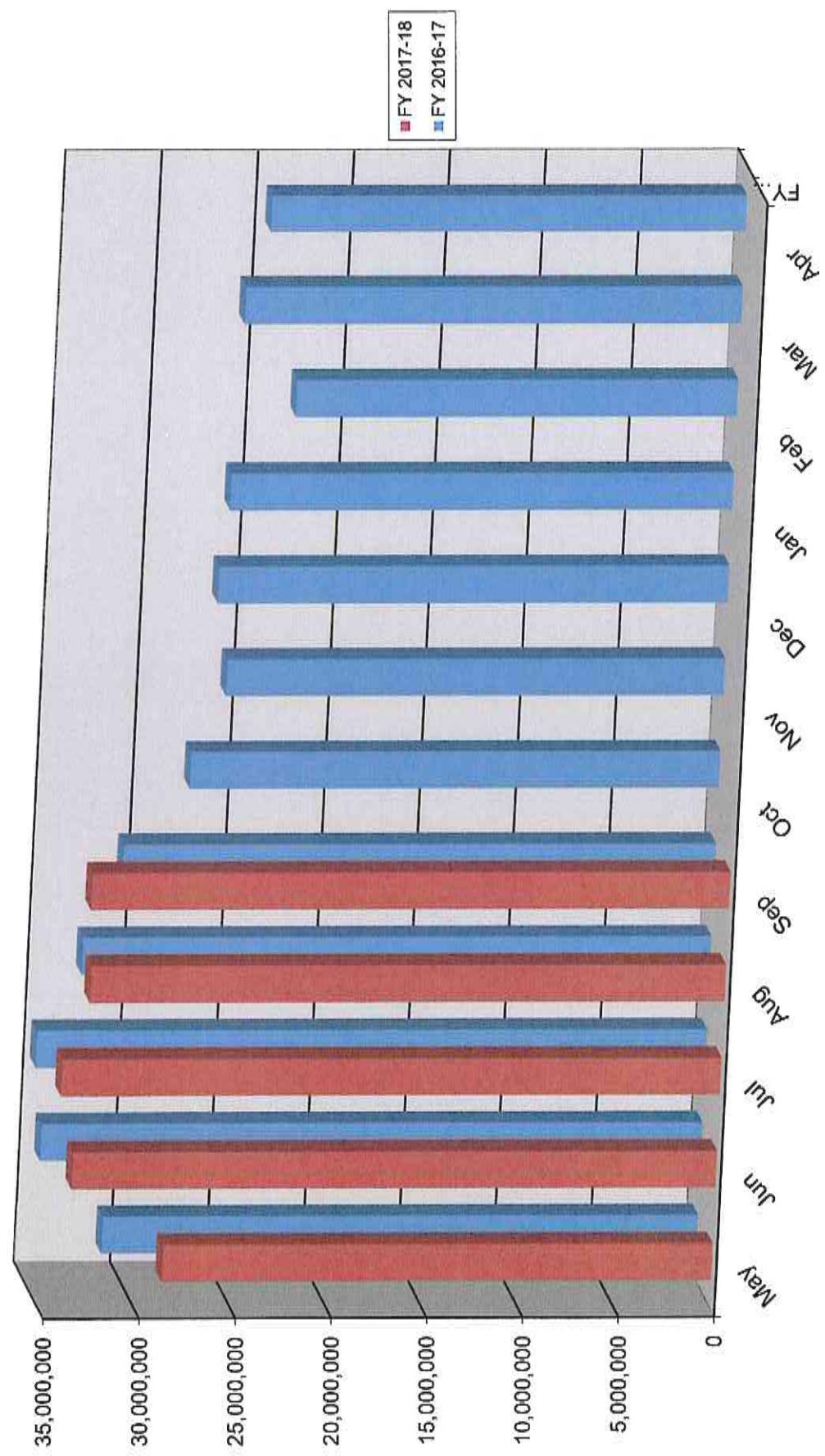
FY17/18 PUMPAGE PROJECTION (gallons): 350,000,000

FY17/18 GALLONS PUMPED TO DATE: 162,868,000

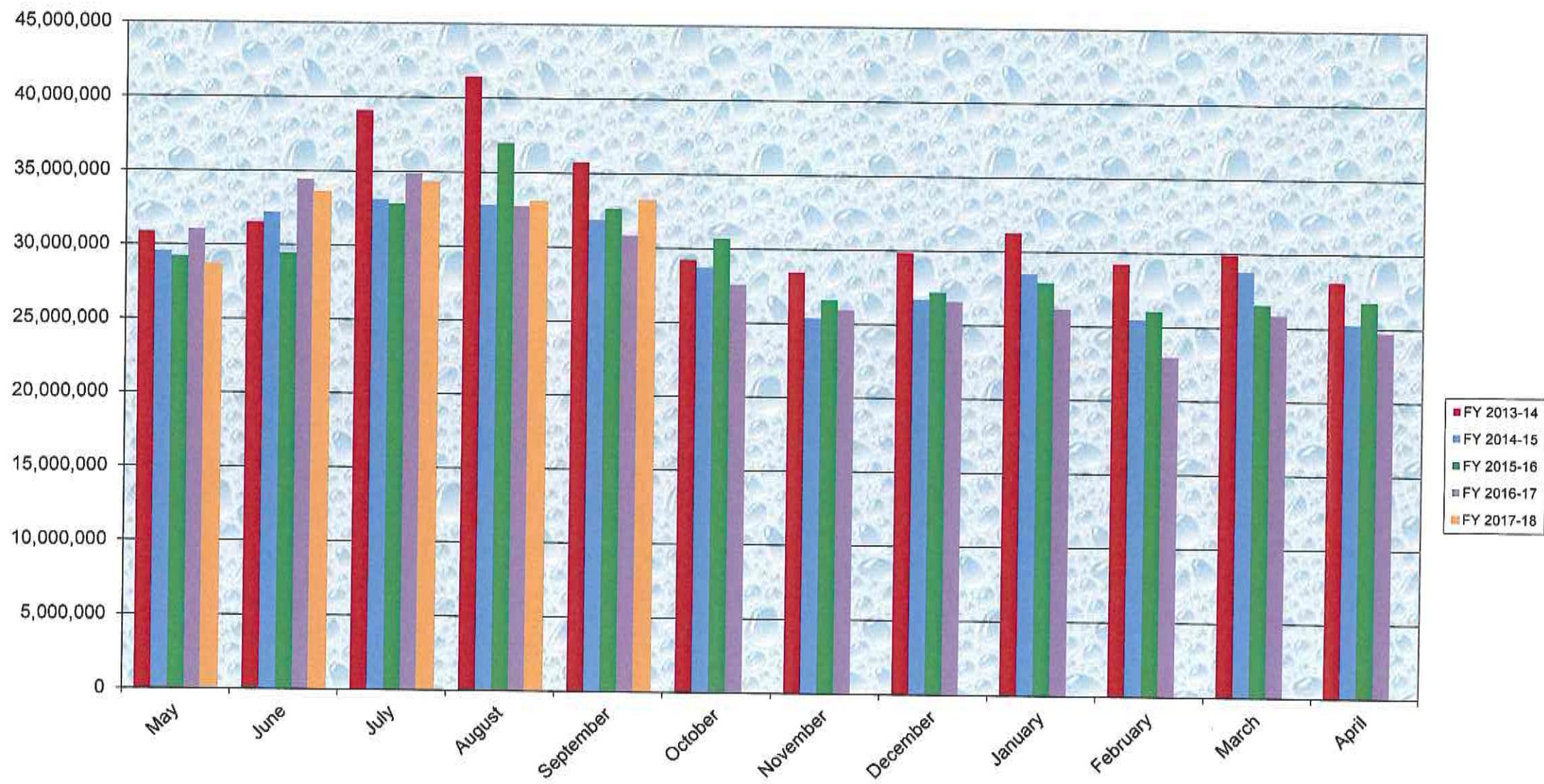
All table figures  
are in millions  
of gallons sold  
on a monthly  
basis per fiscal  
year.

CURRENT PERCENTAGE  
PUMPED COMPARED TO  
46.53%

## Monthly Pumpage Chart



## Village of Willowbrook Pumpage Report



# CITY OF Willowbrook

## MONTHLY DATA REPORT

	Tons Collected by Month			Recycling Detail		Email To: <a href="mailto:ghummel@willowbrook.il.us">ghummel@willowbrook.il.us</a>
	Refuse	Recyclables	Yard Waste	Paper Fiber	Commingled Containers	
January-17	74.84	48.11		33.49	14.62	
February-17	66.17	35.18		24.49	10.69	
March-17	64.75	40.46		28.16	12.30	
April-17	76.11	40.36	6.43	28.09	12.27	
May-17	80.18	43.25	5.12	30.11	13.14	
June-17	84.75	39.56	3.95	27.54	12.02	
July-17	94.46	45.84	2.30	31.91	13.93	
August-17	93.77	45.34	3.01	31.56	13.78	
September-17	116.38	42.12	2.69	29.32	12.80	
October-17				0.00	0.00	
November-17				0.00	0.00	
December-17				0.00	0.00	
<b>Totals</b>	<b>751.41</b>	<b>380.22</b>	<b>23.50</b>	<b>264.67</b>	<b>115.55</b>	
<b>Monthly Average</b>	<b>83.49</b>	<b>42.25</b>	<b>3.92</b>	<b>22.06</b>	<b>9.63</b>	
<b>Weekly Average</b>	<b>19.27</b>	<b>9.75</b>	<b>0.90</b>	<b>5.09</b>	<b>2.22</b>	

Percentage of Materials Collected





### Village of Willowbrook

#### September 2017 – Status Report

##### Season Perspective

Introduction: Weather conditions critically affect the seasonal mosquito population. Excessive rainfall periods trigger hatches of floodwater mosquitoes (*Aedes vexans*), the dominant annoyance species in northern Illinois that has a flight range of 15 to 20 miles. The other target species is the northern house mosquito (*Culex pipiens*), the primary vector of West Nile virus (WNV) that flourishes under stagnant water drought conditions.

---

Current Status: Northern Illinois experienced the 23<sup>rd</sup> warmest September on record with temperatures averaging 17 degrees above normal. The heatwave extended the mosquito season into the last week of the month. The floodwater mosquito population was a non-factor; however, the hot conditions were conducive to *Culex* development and a surge of WNV activity. Late summer is primetime for WNV transmission as indicated by several human cases being diagnosed in the Chicagoland area, including the first fatality in Kankakee County.

Late season operations focused on *Culex* larval development, and truck ULV adulticide applications were recommended to suppress the adult mosquito population. Summer-like temperatures in the 90s continued until September 28<sup>th</sup> when a sharp cool-down changed the weather pattern, curtailing mosquito activity. The season will cease after the first major frost that typically occurs by October 9<sup>th</sup> in northern Illinois.

---

##### MOSQUITO-BORNE DISEASE UPDATE

###### USA - West Nile Virus (WNV)

2017 Centers for Disease Control & Prevention (CDC) WNV Summary. As of September 19, 2017, a total of 47 states and the District of Columbia have reported West Nile virus infections in people, birds, or mosquitoes in 2017. Overall, 875 cases of West Nile virus disease in people have been reported to CDC. Of these, 537 (61%) were classified as neuroinvasive disease (such as meningitis or encephalitis) and 338 (39%) were classified as non-neuroinvasive disease.

To date, the following eight (8) states account for 77% of the WNV human cases: AZ (47), CA (143), GA (26), IL (37), LA (32), MI (26), MN (22), MS (52), NE (36), NV (43), ND (56), SD (55), TX (74) and UT (28).



### Illinois – WNV Update

- Thirty-nine (39) WNV human cases have been reported in the following counties:

County	Birds	Mosquito Batches	Humans
COOK	7	1165	11
DEKALB	1	4	0
DUPAGE	0	187	4
KANE	1	37	2
LAKE	1	84	6
LASALLE	0	1	0
MCHENRY	0	20	4
STEPHENSON	2	5	0
WILL	0	77	1
WINNEBAGO	2	6	2
<b>TOTAL</b>	<b>23</b>	<b>1929</b>	<b>39</b>



### Zika virus (ZIKV)

The CDC reports the following ZIKV human case summaries for 2016 compared to year-to-date in 2017, as of September 28, 2017:

ZIKV CASE TYPE	UNITED STATES		US TERRITORIES		NOTES
	2016	2017 - YTD	2016	2017 - YTD	
Travelers returning from affected areas	4,830	264	142	0	2016 breakdown: 49 states & DC; IL - 103
Acquired through presumed local mosquito-borne disease transmission	224	1	35,937	556	2016 breakdown: FL-218, TX-6, PR-34,963
Acquired through other routes (e.g. sexual, laboratory or blood-borne transmission)	48	3	0	0	
<b>HUMAN CASE TOTALS</b>	<b>5,102</b>	<b>203</b>	<b>36,079</b>	<b>554</b>	

### Brood Prediction

The floodwater mosquito (*Aedes vexans*) is the key nuisance species in the Chicagoland area. Distinct hatches of floodwater mosquito populations, or broods, are triggered by significant rainfall events. The Clarke Brood Prediction Model calculates peak annoyance periods based on rainfall and temperature data collected from weather stations in your area.

No Brood Predictions to report

### Upcoming September Operations

Operations have been completed for the 2017 season.

### New Jersey Light Trap Counts

(\*Red numbers indicate an annoyance level)

Trap Location	Sep 01	Sep 04	Sep 06	Sep 08	Sep 11	Sep 13	Sep 15	Sep 18	Sep 20	Sep 22
Willowbrook Community Park Midway Dr	3	0	0	1	1	0	0	0	0	1

### Services Performed 2017:

Service Item	Start Date
ROS1305 - Culex Site Inspection Service	09/12/2017



TRIBUNE INVESTIGATION: THE WATER DRAIN

# SAME LAKE, UNEQUAL RATES

Why our water rates are surging – and why black and poor suburbs pay more



By Ted Gregory, Cecilia Reyes, Patrick M. O'Connell and  
Angela Caputo

PUBLISHED: OCT. 25, 2017

Lake Michigan water rates have been surging throughout the Chicago region in recent years, squeezing low-income residents and leaving them with little, if any, recourse, a Tribune analysis shows.

In this tangled network that delivers water to the vast majority of the region's residents, the Tribune found an upside-down world, one where people in the poorest communities pay more for a basic life necessity than those in the wealthiest.

And the financial pain falls disproportionately on majority-African-American communities, where residents' median water bill is 20 percent higher for the same amount of water than residents pay in predominantly white communities, the Tribune's examination revealed.

Consider Ford Heights, a cash-strapped, predominantly African-American suburb south of Chicago. People there pay nearly six times more for the same amount of water

four times more than Chicago residents.

In the end, little is stopping local leaders from raising rates even more: Illinois regulators have no oversight authority over towns' water rates.

"Their residents are experiencing a regressive kind of tax that is having a significant impact on their quality of life," said Robert Bullard, professor of urban planning and environmental justice at Texas Southern University.

"We call that environmental injustice because people who have the lowest amount of money are forced to pay the most for basic services," added Bullard, who has written extensively about racial disparity in public services.

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Community leaders offer a variety of explanations for the high rates. Some acknowledge that residents are paying for significant amounts of water lost through cracked pipes and leaky hydrants. Others say they are imposing higher rates to pay exorbitant replacement costs of that infrastructure.



**"We call that environmental injustice because people who have**

services.”

**Robert Bullard** professor of urban planning and environmental justice at Texas Southern University

Through it all, little accountability exists, both in the rates they set and how well the communities maintain their systems. In the past two years, two towns — Harvey and Maywood — have been singled out for mismanagement or fraud.

Unlike other utilities such as electricity and natural gas, and unlike other states' policies, Illinois allows the local officials who collect the water revenue also to set rates.

Robert Hylton is living with the consequences.

The western suburb of Maywood, where Hylton has resided in a tidy, orange brick ranch since the late 1970s, shut off his water in May while he was rinsing a cup at breakfast, he recalled.

“I couldn’t finish my breakfast,” the 77-year-old widower said, standing in his kitchen on a Thursday afternoon in late June. A fly buzzed around a pile of dirty dishes in the sink. “I threw everything in the garbage.”



Robert Hylton lived without water this past summer. The village of Maywood disconnected it without notice, he said, only to restore it later. (Antonio Perez / Chicago Tribune)

Water rates in Maywood are among the highest in the Chicago region, in part to pay for the 38 percent of water the village loses before it ever reaches the taps of residents like Hylton.

Seconds after Hylton's water was shut off, he walked to his front door and saw a Maywood Water Department worker on the lawn near the valve, he recalled. Hylton said he told the man that part of the water bill had been paid and he was hoping to arrange a payment plan.

The worker said he merely was carrying out orders, then stepped into his van and drove away, Hylton said.

The latest census figures show that Maywood has about 7,400 households. Last year, the village issued 1,436 water disconnection notices on residential and commercial accounts, records show, though it's unclear how many of the notices led to water service being discontinued.

If a resident loses water service — Maywood can disconnect after a bill is unpaid for 30 days — resuming that basic utility costs \$300.

predominantly African-American towns. Chicago Heights' fees and fines can reach several hundred dollars. Calumet Park charges \$200. Ford Heights and Glenwood each charge \$100.

Those high reconnection fees make residents' efforts to get water flowing again that much more challenging after scraping together enough to pay the sometimes-exorbitant balance on their water bills.

The shutoff of Hylton's water forced him to make a series of accommodations. He showered at a friend's house down the block. He accepted containers of water from neighbors to wash dishes. He used a bucket in his garage to relieve himself, he said. His clothes went unwashed.



**“You owe them a dime, they cut you off.”**

**Robert Hylton**

“We cannot survive without water,” Hylton said.

The retired security guard said he receives about \$940 a month from Social Security and his mortgage payment is \$680 a month. The bill he received on May 19 shows that he owed \$333.28 for water on the original due date of May 15, and a \$11.55 “penalty amount.”

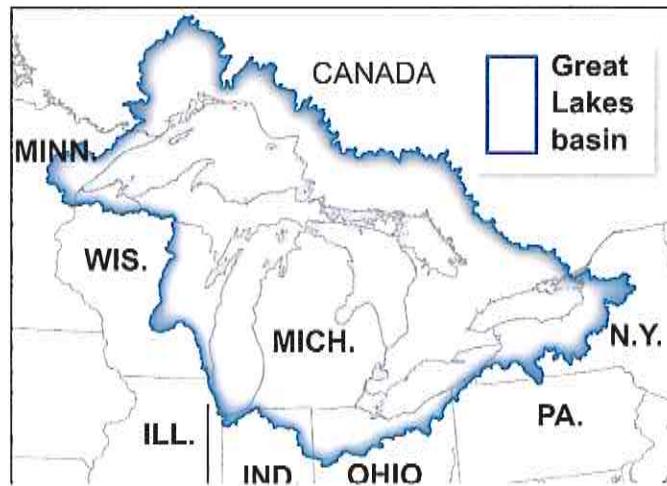
Printed on it are the words “Past Due Notice,” although the bill doesn't specify the time period of his use or the amount of water he'd consumed.

and wanted an additional \$250, he recalled. He came up with the money a few days later, and his water service resumed in early July, Hylton said. Maywood did not respond to requests for comment on Hylton's experience.

"You owe them a dime, they cut you off," Hylton said. "They have been very dirty to me. Very dirty. If I had enough money to get a lawyer, I would sue them."

### Great Lakes water usage

An agreement among the eight states that border the Great Lakes sets down rules by which municipalities can allocate water from the lakes. Generally, any municipality within the Great Lakes basin can access the water. If a municipality or county straddles the boundary, it must seek permission.



In making its analysis, the Tribune requested water rates and demographic data from 163 communities with publicly managed systems that use Lake Michigan water.

Of those, 162 responded. One community, Harvey, does not list rates on its water bills and did not respond to requests from the Tribune.

The findings showed enormous differences across the region.

Residents of Evanston, a majority-white city of 75,000 that draws its own water from Lake Michigan, paid the lowest rate for 5,000 gallons of water, \$13.71. Two other heavily industrial communities with populations under 600 — McCook and Bedford Park — do not charge residents for water.

About 45 miles south of Evanston is Ford Heights, which has a dwindling population and paltry tax base. There, residents are charged a flat fee of \$85 a month — the second-highest amount per 5,000 gallons in the region. Only Indian Head Park, which recently raised its rates to pay for an ambitious infrastructure upgrade, is higher, at \$87.50.

Overall, towns with median household incomes in the bottom 10 percent of the region pay 31 percent more a month for water than towns with a median household income in the top 10 percent.

**DATABASE:****How much is your water? How old are your pipes?**

The Tribune analyzed 163 municipalities with publicly managed water systems that use Lake Michigan water. The data is from 2015. The Tribune also analyzed 400 municipalities with privately managed water systems that use Lake Michigan water. The data is from 2015. The Tribune also analyzed 400 municipalities with privately managed water systems that use Lake Michigan water. The data is from 2015.

region. Search for your town below to find billing and water use information.

SEARCH: Willowbrook

## Willowbrook

# \$48.35

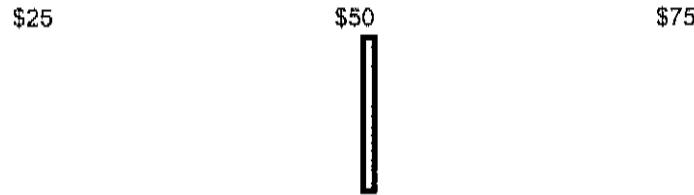
The monthly water bill for 5,000 gal. in 2017

Bottom 20% of rates

Typical range

Top 20% of rates

### CHICAGO-AREA WATER RATES



Willowbrook's water bill is higher than 95 of the 162 towns that provided information.

This town's average bill **increased** by 34% from 2013, when it was \$35.95.

---

This is the percentage of water this municipality reported losing in 2016 through leaky pipes or water main breaks. The state standard is 12 percent.

**2.62%**

12%: IDNR loss standard

---

## Supply chain

Follow the chain and wholesale price per 5,000 gallons of water from Lake Michigan to the municipality for 2017

**DuPage Water Commission** \$24.25**Willowbrook****Age of pipes, in 2014**

Willowbrook reported 43 miles of water pipes.

0-20 years	21-40 years	41-60 years	61+ years
10%	66%	17%	7%

That disparity falls not only along income lines, but also disproportionately along racial lines.

Of the 10 towns with the highest water rates, five, or 50 percent, are majority-black towns, while only 13 percent of communities surveyed by the Tribune have majority-black populations.

Another indicator, the U.S. Environmental Protection Agency's [affordability guidelines from 1998](#), concluded that spending more than 2.5 percent of an individual's yearly income on a single utility bill signaled that the utility had "a large economic impact" on its residents.

**3D TOUR: Who uses the lake?**

From factories to faucets and powerplants to parks, millions use  
Lake Michigan water

[Take the tour](#)

predominantly African-American.

Here are a few comparisons of what residents from towns with roughly equal populations pay per 5,000 gallons, the amount experts say is the monthly supply for a typical household:

In Northfield, a high-income, predominantly white suburb, residents pay \$36.34. In Posen, a majority-Latino south suburb where a quarter of the population lives below the poverty line, residents pay \$64.60.

Residents of Glenwood, a lower-income, predominantly black community, pay \$67.60. In the largely middle-income, predominantly white suburb of Willowbrook, residents pay \$48.35.

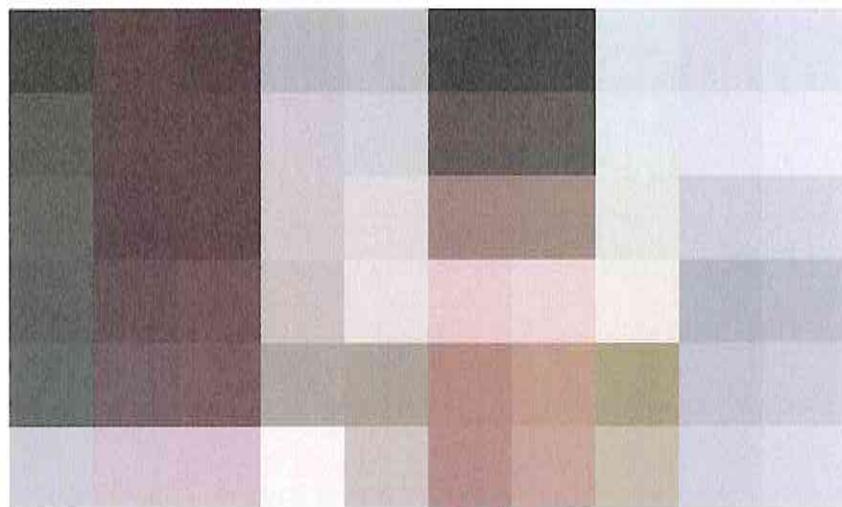
And in Northbrook, a high-income, predominantly white community, residents pay less than \$25. Consumers in Chicago Heights, a low-income, mixed-race community, pay nearly \$36.

And, although Indian Head Park and Ford Heights pay about the same for water, the bill throws a harder punch at Ford Heights' residents, who have a significantly lower median household income.

"It's horrible. It really is," said Illora Walker, while she sat in a lawn chair on her front lawn on a recent Tuesday afternoon. Her fixed monthly income is \$1,034, she said. Her monthly rent: \$900.

Even with a discounted water bill of \$65 for seniors, she has trouble making ends meet.

To bring in extra income, she said, she gathers aluminum cans and turns them in for 25 cents a pound. She eats for free at the neighborhood senior center six days a week to cut her food costs.



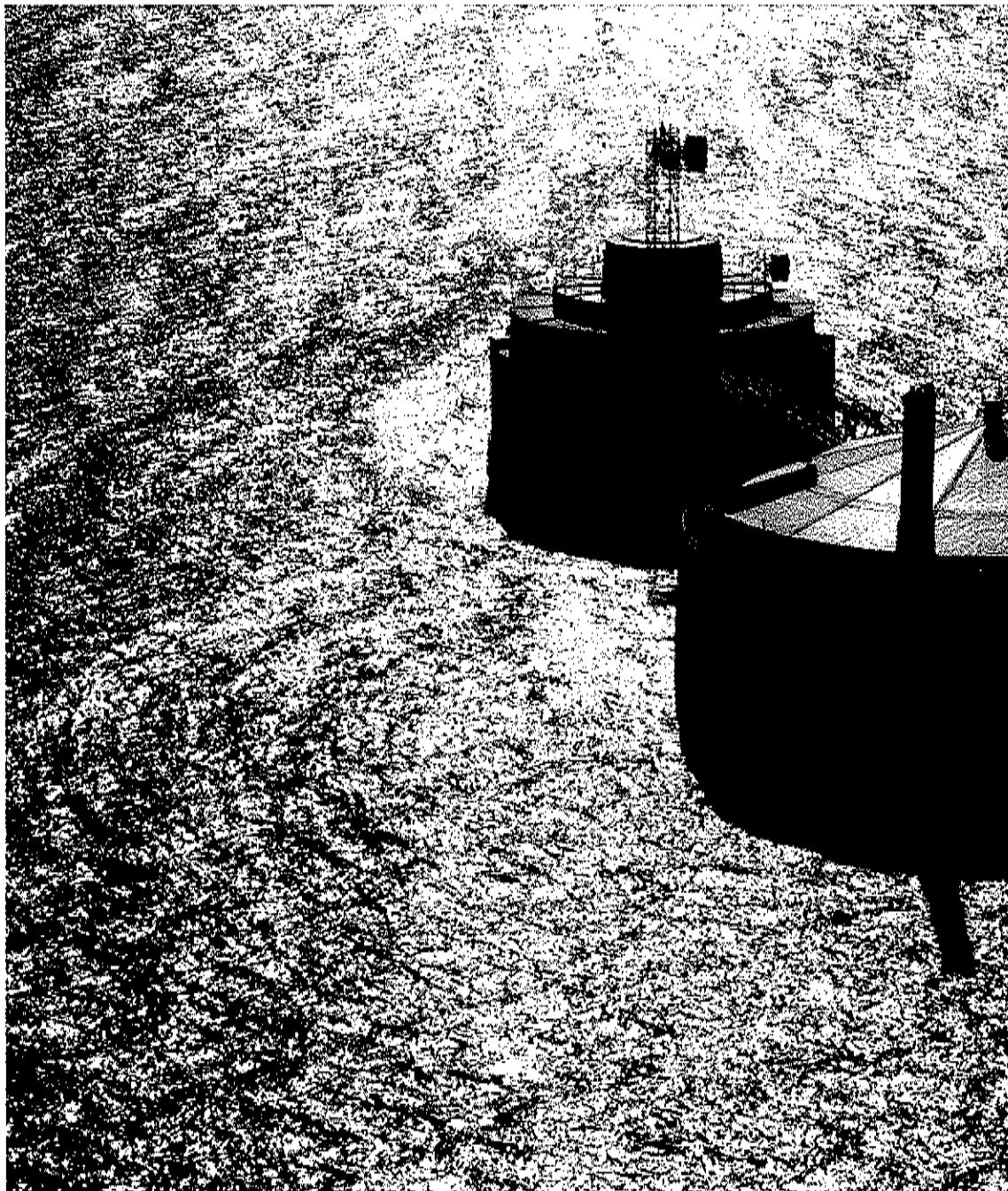
Ruthie Beasley, 53, of Ford Heights, says the village's \$85 monthly water bill is "a real hardship." (Antonio Perez / Chicago Tribune)

A few blocks away, Ruthie Beasley, also on a fixed income, called the standard \$85 monthly water bill "a real hardship." Since the village raised its water fee last year to that amount, she said, she missed a payment and had her water shut off for a day.

A son pays most of Beasley's water bill now, she said.

Beasley, who has lived in a small, vinyl-sided ranch for eight years, said she has cut back on groceries and visits to the hairdresser.

"A big part of it," she added, "is that I don't get to tithe the way I used to.



at collect drinking water from Lake Michigan serve nearly 80 percent of the region's residents. (Antonio Perez / Chic

## From lake to tap

The disparity has emerged even though nearly 80 percent of the Chicago region uses water from the same source -- Lake Michigan, one of the world's most bountiful supplies of freshwater. The Great Lakes contain more than 20 percent of the world's total surface freshwater supply and 84 percent of North America's fresh surface water.

Lake Michigan, the world's sixth-largest freshwater lake, is second by volume of the five Great Lakes.

The city of Chicago, which collects the lake water in two cribs about 2 1/2 miles from shore, provides most of that water. From the cribs, it flows through underground tunnels to a pair of purification plants — one just north of Navy Pier, the other near Rainbow Beach Park on the South Side.

At the plants, the water is cleaned, filtered and treated, yielding fresh, potable water ready for distribution. A dozen pumping stations move the water — via 4,000 miles of pipe — throughout the city.

In addition to supplying water to its residents, Chicago supplies water to dozens of towns and agencies, some of

The DuPage Water Commission, for example, buys its water from Chicago and pumps it to 25 other communities, areas of unincorporated DuPage County, Argonne National Laboratory and privately run systems.

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The web of connections can yield a scenario in which a town receives Lake Michigan water after it passes through three or four other communities or providers. Each transaction generates a markup.

Delivering water that way can lead to incrementally higher rates for communities farther from Lake Michigan, but that alone does not account for the broad disparity in water rates across the region.

The small southwest suburb of Indian Head Park is one example. It receives Lake Michigan water from Countryside, which receives it from McCook, which receives it from Chicago.

Chicago charges McCook a wholesale rate that works out to \$19.05 per 5,000 gallons.

McCook sells it to Countryside at \$24.30 and Countryside charges Indian Head Park \$29.90.

By the time Indian Head Park sells its water to residents, the rate is \$54.50 per 5,000 gallons. That

Tribune surveyed.

Village Administrator John DuRocher said Indian Head Park raised rates recently to pay for sorely needed improvements to its infrastructure, starting with replacing all water meters last year and continuing next year with the replacement of 2 miles of water mains.

“We see the need for massive water infrastructure repairs,” DuRocher said, “and that’s what we’re committed to.”

Similar circumstances exist in north suburban Bannockburn and west suburban Clarendon Hills, where Village President Len Austin acknowledged that his town’s rates were high — Clarendon Hills’ are the fourth-highest in the region. But he noted that the water department is debt-free and that trustees raised rates primarily to pay for replacing water mains throughout the village.

Other communities have allowed that infrastructure to deteriorate, leading to staggering losses of treated water that the towns — and their residents — pay.

More than 25 billion gallons of Lake Michigan water was lost in 2016 after flowing through the crumbling system, at a cost of more than \$44 million, according to records from the Illinois Department of Natural Resources and Tribune calculations.

Maywood, Hometown, East Hazel Crest, Burnham and Posen lost at least one-third of their water last year — the most in the region, according to documents they filed with IDNR. Another 16 communities lost 20 to 32 percent of their water, the documents show.

## Have you had water trouble?

Do you have concerns or complaints about how your town handles water bills and service? We want to hear your story.

Submit your story

## Surging water rates

Rate increases theoretically correlate with the cost of keeping that water delivery system solvent. But the reality is more complicated, and more costly.

Starting in 2012, Chicago began aggressively hiking water rates — by 90 percent over four years — to make overdue infrastructure repairs. Then in 2016, city officials, desperate for cash, imposed a water and sewer tax to generate revenue for a chronically underfunded pension system.

Price increases rippled across the region.

As Chicago raised rates, nearly 1 in 4 suburbs in the past four years have quietly passed along higher increases. In a handful of towns, those increases were twice as high as Chicago's.

The result was that between 2013 and 2017, the median cost of Lake Michigan water for a typical household rose from \$34 to \$45 per month, or 32 percent, the Tribune's findings show.

In the 10 towns with the highest water rates, the typical family's water bill grew to \$75 from \$51, or by 46

Those bills far surpass Chicago's rates, which are \$19.40 for the first 5,000 gallons of water.

The double whammy is that many of those communities hit with the largest rate hikes already were paying high water prices. But those towns' populations are dwindling. Many of their businesses and industries have departed.

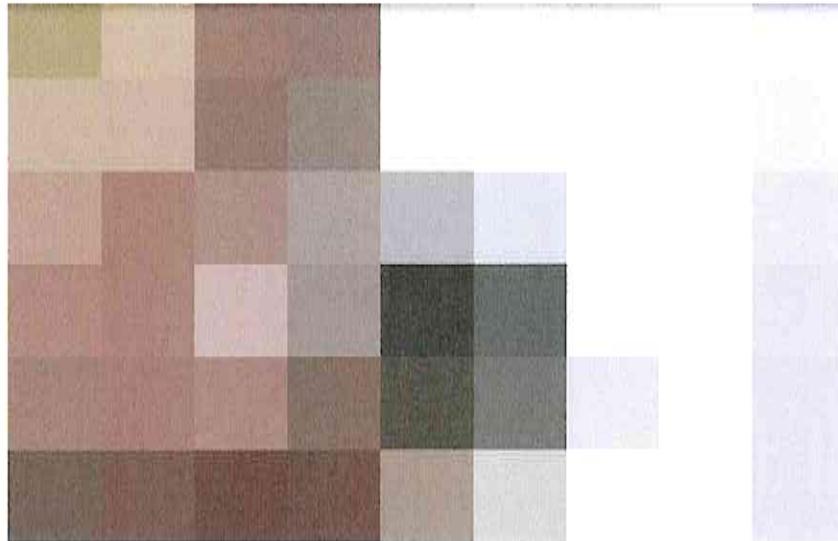
That scenario leaves local officials with few options for raising revenue while they try to maintain a water infrastructure built for the robust past.

"If you need revenue for your municipality and you don't have a sales tax base and you don't really have a property tax base, whoever you do have, whether they're poor or a mom and pop store, they still need water. It's a relatively dependable revenue base," said Josh Ellis, Metropolitan Planning Council vice president.



**"If you need revenue for your municipality and you don't have a sales tax base and you don't really have a property tax base, whoever you do have ... they still need water."**

**Josh Ellis** Metropolitan Planning Council vice president.



Josh Ellis, vice president of the Metropolitan Planning Council, holds a section of a wood pipe that once served Chicago's water system. Crews have been removing the relics during water main replacement work. (Antonio Perez / Chicago Tribune)

## Water mismanagement

One of the more egregious examples of water mismanagement has occurred in south suburban Harvey, where, according to the U.S. Census Bureau, 36 percent of the population lives in poverty and 95 percent are African-American or Latino.

On the surface, the way it manages its water seems straightforward: The town buys from Chicago and sells to its residents, institutions and businesses, and to surrounding communities, including Dixmoor.

But in court documents from litigation Chicago filed against Harvey in 2012, Harvey acknowledged that for several years starting in 2008 it received millions of gallons of water a day from the city, resold it and failed to pay Chicago.

The financially wracked community also admitted in court documents that it had used money earmarked for water payments to cover unrelated loans.

But in July, the judge found Harvey had repeatedly violated the agreement and ordered a receiver to take control of the suburb's water fund, saying Harvey's leaders "failed to grasp the severity of their years of illegal conduct."

In her ruling, Cook County Circuit Judge Kathleen Pantle said millions of dollars were missing and \$26 million was misspent. Those funds, which should have been used to pay off the debt to Chicago, were instead diverted to other accounts, the judge found.

In an interview in September, Sean Howard, spokesman for Harvey Mayor Eric Kellogg, rejected the judge's finding that the suburb "misallocated" water funds. Howard also contended that Harvey paid "a huge amount of money" to Chicago and blamed Chicago's water department for "the ridiculous way they increase rates arbitrarily."

In addition, Harvey did not pass along Chicago's rate increases to the south suburb's residents, who cannot afford to pay them, he added.

"We're not Wilmette," Howard said, referring to the wealthy North Shore community.

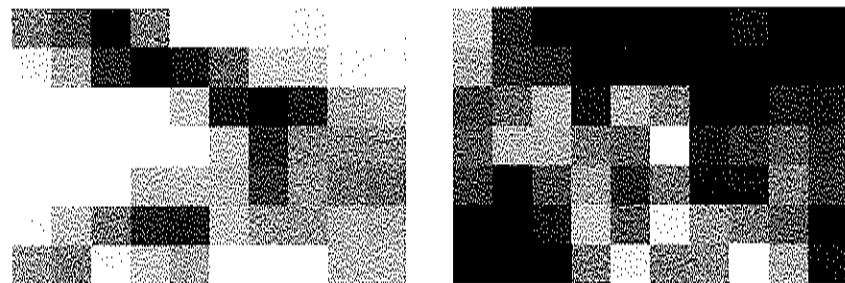
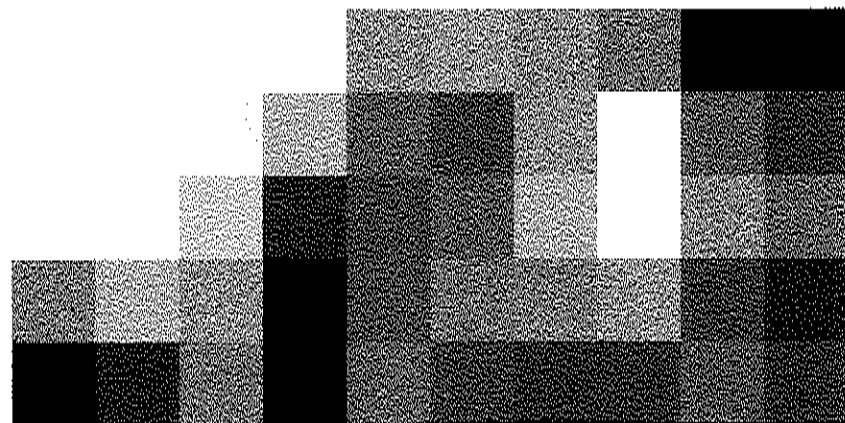
Harvey is appealing the ruling and is talking with state lawmakers to encourage the state to regulate how cities raise water rates, Howard said.

Maywood is another town notorious for water mismanagement issues, some dating to 1996, when federal investigators looked into the municipality after \$160,000 was found missing from the water department.

Maywood municipal employees received fraudulent payments from the village for purported overcharges on their water bills. The employees were fired.

Residents say they're suspicious of local leaders when it comes to managing water. Some, like Esthela Corona, are confounded.

Since her family moved to the gray vinyl-sided house on a Maywood corner in 2011, Corona had been paying about \$95 a month for water, already high enough that she endured a shutoff for three days in 2013 when she couldn't make a payment.



Esthela Corona, with her grandson Devon Valle at her home in Maywood, received a water bill this past spring of more than \$2,000. Because of the high water bills, she says, she is planning to move to another town. (Antonio Perez / Chicago Tribune)

In late March this year, the village installed a new water meter battery on her home. Her next monthly water bill

"It was crazy," Corona, a 65-year-old widow on a fixed income, said one morning at her dining room table. "I told my son, 'Oh, I don't believe it.' I thought it was a mistake."

She said she went to a second-floor room in Maywood's public works building set aside for residents' complaints about water bills. An employee told Corona the bill was for water that had been provided to the home and had gone unrecorded by the old meter, Corona recalled.

But she said the employee was unable to provide proof of past water use in her home.

The employee lowered Corona's bill to \$95 and told her the village would examine the matter. On May 19, Corona received her next bill. It was for \$1,276, or nearly \$540 more than her monthly Social Security benefit.

Her daughter Guadalupe Fabian began urging Corona to move from Maywood. Instead, Corona negotiated a monthly water payment of \$450.

That's a temporary arrangement. Corona said she was planning to move as soon as possible to Justice, where Fabian lives.

Maywood's high water rates are a result of "debt services" to neighboring Melrose Park, which provides Lake Michigan water to Maywood, and significant water loss, Village Manager Willie Norfleet Jr. said.

Maywood charges the sixth-highest rate among towns receiving Lake Michigan water in the Chicago region.

Underlying the abuses like those in Harvey and Maywood is a system that lacks accountability.

In Illinois, the Commerce Commission regulates utilities like electricity, natural gas and private water distribution companies. The Illinois Department of Natural Resources manages Lake Michigan water allocation, and the Illinois Environmental Protection Agency tracks water quality.

But state law exempts municipally owned utilities from the definition of public utility, which removes the Illinois Commerce Commission from monitoring the rates of all but private water systems.

That allows municipalities to set their water rates.

Public officials can raise those rates by adopting an ordinance, which comes with no guarantees that the municipal leaders will keep water revenue in water accounts. In fact, it's legal for towns to divert water revenue to other purposes, provided local officials deem the water system is being managed properly.

Residents have little recourse over rate increases or water fund transfers for nonwater purposes.

When angry residents call the Citizens Utility Board seeking help in dealing with exorbitant water bills, the board encourages the critics to gather as many similarly outraged residents as possible and raise the issue with their local elected leaders.

It's a different story in Wisconsin. Since 1907, the state has had its Public Service Commission, an independent

Those utilities are required to obtain approval from the commission to raise water rates, undertake construction projects, even issue stocks or bonds. Publicly run utilities are also required to submit lengthy audits each year outlining everything from staff counts to the cost of buying and delivering water and the age of each section of pipe or pumps.

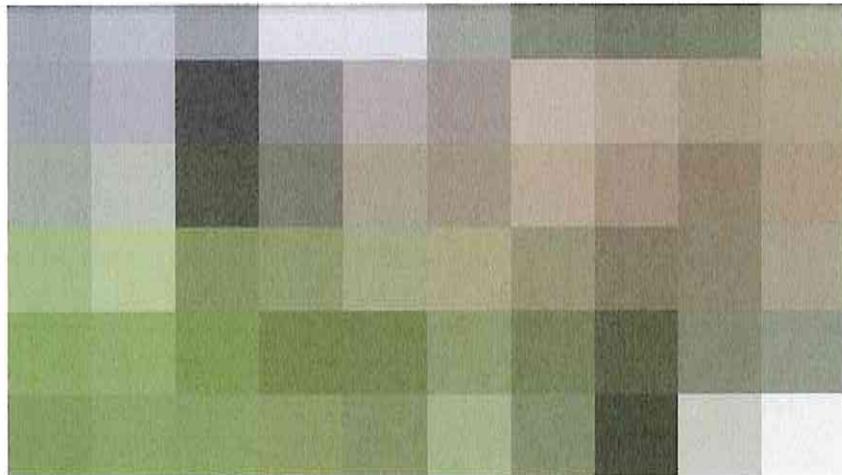
In addition, the commission can direct utilities to become more efficient if the commission detects disproportionate water loss.

With this oversight, water bills in Wisconsin communities that withdraw or purchase Lake Michigan water are more consistent than those in Illinois -- the highest charge was \$56 for 5,000 gallons a month. The bills are generally much lower as well, even though some municipalities include water-related charges in residents' property taxes, which are not reflected in the data provided by the commission.

Illinois has no such oversight of publicly managed water systems. Daniel Injerd, IDNR's director of water resources, said his department "has no statutory authority" to be involved with rate setting in communities.

"You'd have to have a huge, huge staff to begin to analyze all of the information," Injerd added. Beyond that, from a philosophical perspective, Injerd said he is sensitive to big government bodies imposing their will on smaller governments.

Navigating rate complexities, he said, "is just a pit that I would never want to go into."



Charlene McFadden, shown at her home in Dixmoor, has long complained to the village about high water bills. (Antonio Perez / Chicago Tribune)

## A daily struggle

Charlene McFadden, who often finds herself paying more than \$100 a month for water in Dixmoor, has been complaining about rising rates to village officials for years, even taking her complaints to village board meetings.

The efforts have made little difference, McFadden said.

“We’re talking to a brick wall,” she said on a muggy Thursday afternoon, adding that officials pass rate hikes with little public consideration or discussion. “They come up with all of these excuses.”



**“We’re talking to a brick wall. They come up with all of these excuses.”**

**Charlene McFadden** Dixmoor resident

One of the reasons village officials offer to McFadden for the increased rates is that Dixmoor often falls behind on