

Winnetka Village Council
REGULAR MEETING
Village Hall
510 Green Bay Road
Tuesday, September 6, 2016
7:00 p.m.

Emails regarding any agenda item are welcomed. Please email contactcouncil@winnetka.org, and your email will be relayed to the Council members. Emails for the Tuesday Council meeting must be received by Monday at 4 p.m. Any email may be subject to disclosure under the Freedom of Information Act.

AGENDA

- 1) Call to Order
- 2) Pledge of Allegiance
- 3) Quorum
 - a) September 13, 2016 Study Session
 - b) September 20, 2016 Regular Meeting
 - c) October 4, 2016 Regular Meeting
- 4) Approval of Agenda
- 5) Consent Agenda
 - a) Approval of Village Council Minutes
 - i) August 16, 2016 Regular Meeting3
 - b) Approval of Warrant List dated August 12 – September 1, 20168
 - c) Resolution No. R-46-2016: Purchase of Two Stormwater Pumps (Adoption)9
- 6) Stormwater Report: None.
- 7) Ordinances and Resolutions: None.
- 8) Public Comment
- 9) Old Business
 - a) 5 Indian Hill Road, Subdivision and Zoning Variation: Policy Direction.....15
- 10) New Business
 - a) Water Main Replacement Plan and Water Rate Study32
- 11) Appointments

- 12) Reports
- 13) Closed Session
- 14) Adjournment

NOTICE

All agenda materials are available at villageofwinnetka.org (Government > Council Information > Agenda Packets & Minutes); the Reference Desk at the Winnetka Library; or in the Manager's Office at Village Hall (2nd floor).

Broadcasts of the Village Council meetings are televised on Channel 10 and AT&T Uverse Channel 99 every night at 7 PM. Webcasts of the meeting may also be viewed on the Internet via a link on the Village's web site: <http://www.villageofwinnetka.org/government/village-videos/>.

The Village of Winnetka, in compliance with the Americans with Disabilities Act, requests that all persons with disabilities who require certain accommodations to allow them to observe and/or participate in this meeting or have questions about the accessibility of the meeting or facilities, contact the Village ADA Coordinator – Megan Pierce, at 510 Green Bay Road, Winnetka, Illinois 60093, 847-716-3543; T.D.D. 847-501-6041.

**MINUTES
WINNETKA VILLAGE COUNCIL
REGULAR MEETING
August 16, 2016**

(Approved: xx)

A record of a legally convened regular meeting of the Council of the Village of Winnetka, which was held in the Village Hall Council Chambers on Tuesday, August 16, 2016 at 7:00 p.m.

- 1) Call to Order. President Greable called the meeting to order at 7:00 p.m. Present: Trustees Andrew Cripe, William Krucks, Christopher Rintz and Kristin Ziv. Absent: Trustees Penfield Lanphier and Scott Myers. Also present: Village Manager Robert Bahan, Assistant to the Village Manager Megan Pierce, Village Attorney Peter M. Friedman, Finance Director Tim Sloth, Assistant Finance Director Nick Mostardo, Director of Public Works Steve Saunders, Chief of Police Patrick Kreis, Deputy Police Chief Marc Hornstein, Public Safety Analyst Keri Kaup , and approximately 8 persons in the audience.
- 2) Pledge of Allegiance. President Greable led the group in the Pledge of Allegiance.
- 3) Quorum.
 - a) September 6, 2016 Regular Meeting. All of the Council members present indicated that they expect to attend.
 - b) September 13, 2016 Study Session. All of the Council members present indicated that they expect to attend.
 - c) September 20, 2016 Regular Meeting. All of the Council members present indicated that they expect to attend.
- 4) Approval of the Agenda. Trustee Cripe, seconded by Trustee Ziv, moved to approve the Agenda. By voice vote, the motion carried.
- 5) Consent Agenda
 - a) Village Council Minutes.
 - i) July 27, 2016 Special Meeting.
 - ii) August 2, 2016 Regular Meeting.
 - b) Warrant List. Approval of Warrant List dated July 29 – August 11, 2016 in the amount of \$1,320,867.12.
 - c) Resolution No. R-43-2016: First Amendment to IGA with New Trier High School Regarding Installation of Water And Electric Utility Improvements (Adoption). A Resolution approving a first amendment to the intergovernmental agreement between the Board of School District 203 and the Village of Winnetka regarding installation of Water & Electric utility improvements, as presented in Exhibit A.
 - d) Resolution No. R-44-2016: Approving an Intergovernmental Agreement with New Trier Regarding the Maintenance of Street Lights (Adoption). A Resolution approving an intergovernmental agreement concerning street light maintenance with the Board of School District 203, as presented in Exhibit A.

- e) Village Green Flag Request. Approval of a request to plant flags on the Village Green in commemoration of those who lost their lives during the 9/11 attacks.

Trustee Ziv, seconded by Trustee Krucks, moved to approve the foregoing items on the Consent Agenda by omnibus vote. By roll call vote, the motion carried. Ayes: Trustees Cripe, Krucks, Rintz and Ziv. Nays: None. Absent: Trustees Lanphier and Myers.

6) Stormwater Report.

- a) Sewer Backup Prevention Program – Additional Funding. Mr. Saunders reported that the Village has received almost 40 inquiries about the Backup Prevention Program. He explained the initial \$50,000 in funding allocated at the time the Council resurrected the program will not be enough to serve all the interested residents. He added that a number of homeowners who installed backup prevention systems while the program was on hiatus have asked whether they will be eligible for retroactive cost-sharing. He recommended allocating an additional \$50,000 from the Sewer Fund to finance the program.

After Mr. Saunders answered a few questions, President Greable called for audience comment.

Sue McDonald, 788 Green Bay Road. Ms. McDonald said her townhome development suffered a sanitary sewer backup, and she asked specific questions about how her association could qualify for the Backup Prevention Program. Mr. Saunders explained that applicants must fix outstanding cross-connections before they are eligible for the program.

Sean Pinney, 204 Fuller Lane. Mr. Pinney said he applied for funding one month after the Village Council defunded the Backup Prevention Program, and he requested a retroactive reimbursement in the interest of fairness.

Jeffrey Liss, 1364 Edgewood Avenue. Mr. Liss quoted an article from Scientific American, which forecast more flash flooding as warmer temperatures correlate to more intense rain storms.

Trustee Ziv suggested a different characterization for flood protection, as the current ratings based on probability no longer seems to hold true. Trustee Cripe agreed, proposing a numbering or lettering system from least to worst severe.

The Council discussed the logistics of providing retroactive Backup Prevention Program reimbursements. Mr. Saunders explained he would need to research building permits to find the homeowners who installed backflow prevention systems in the past three years.

Trustee Rintz suggested that homeowners who wish to seek retroactive reimbursement should make the effort to file a request – at that time, Mr. Saunders could verify their installation by pulling their building permit.

The Council was in favor of reimbursing the homeowners already in process with the program at the time the funding was terminated in 2013.

There being consensus to increase funding for the current program by \$50,000, Trustee Krucks, seconded by Trustee Cripe, moved to increase funding for the Backup Prevention Program by \$50,000. By roll call vote, the motion carried. Ayes: Trustees Cripe, Krucks, Rintz and Ziv. Nays: None. Absent: Trustees Lanphier and Myers.

Trustee Cripe, seconded by Trustee Rintz, moved to provide retroactive cost-sharing to the homeowners who were in line to receive funding when the 2013 Council defunded the Backup Prevention Program. By roll call vote, the motion carried. Ayes: Trustees Cripe, Krucks, Rintz and Ziv. Nays: None. Absent: Trustees Lanphier and Myers.

7) Ordinances and Resolutions.

a) Resolution No. R-45-2016: Amendment to Agreement for Engineering Services.

Mr. Saunders explained that Strand Associates has performed additional work at the request of the Council. The Subject Resolution would amend their contract to provide for these additional services, which were not included in the original project scope.

There were no audience comments. After a brief Council discussion, Trustee Krucks, seconded by Trustee Ziv, moved to adopt Resolution No. R-45-2016. By roll call vote, the motion carried. Ayes: Trustees Cripe, Krucks, Rintz and Ziv. Nays: None. Absent: Trustees Lanphier and Myers

8) Public Comment.

Linda Kramer, Willow Road. Ms. Kramer said at the previous Regular Council meeting, she distributed a petition asking for reduced speeds and limits on construction truck traffic on Willow Road. She asked what actions had been taken so far.

Mr. Saunders reviewed the results of a traffic study in July, which revealed truck traffic on Willow Road is about the same as truck traffic on other major east-west thoroughfares. He noted that all of these road experience significant truck traffic.

Manager Bahan reported that the Village has learned that New Trier High School's demolition is nearly complete; and the Village has requested that trucks from the upcoming excavation work will be re-routed to Lake Avenue. He explained that local teardown activities necessitate trucks having access to Winnetka's neighborhoods. Lastly, he asked the Chief of Police to comment on speed enforcement on Willow Road.

Chief Kreis noted that the area of Willow Road and Glendale Avenue gets considerable attention from the Police Department, and he added enforcement stops on Willow Road account for 13% of all traffic stops in the Village. He said patrol officers do not report a significant amount of truck-related speed violations, and he described additional measures used to control traffic speed on Willow Road.

Next, Mr. Saunders explained he has asked the Illinois Department of Transportation (IDOT) to perform a traffic study to determine if lower speeds are warranted on Willow Road.

Manager Bahan said the Village would contact Ms. Kramer when it hears back from IDOT about the speed limit, and there will be follow-up with New Trier High School about its construction project.

9) Old Business. None.

10) New Business.

- a) Comprehensive Annual Financial Report (CAFR). Mr. Sloth explained that the Village's annual audit results in a Comprehensive Annual Financial Report (CAFR) from the auditor. He noted that Winnetka remains in a very strong financial position overall, and the General Fund continues to provide adequate funds for operating and capital needs. He introduced the Village's auditor, Ron Amen, of Lauterbach and Amen.

Mr. Amen explained that a new Governmental Accounting Standards Board (GASB) rule does not impact cash flow, bond rating or required pension contributions; however, there will be a change in how pension information is disclosed. He said the change was made to ensure information on pensions will be consistent from an auditing standpoint. He affirmed that the Village is in a strong financial position, has always maintained balanced budgets, and has again achieved an Aaa bond rating.

Mr. Amen answered questions from a few Trustees; there no comments or questions.

- b) Police Communications Consolidation. Chief Kreis explained that the Illinois Legislature has mandated the consolidation of smaller 911 phone centers by July 1, 2017. In order to comply with the new law, the Villages of Winnetka, Northfield, Kenilworth and Glencoe have been analyzing a combined dispatch system. He gave a presentation on the results of their study, which recommends contracting with the Village of Glenview for police dispatching services. He noted that the new model will improve emergency communications and provide significant cost savings.

Manager Bahan stressed that Winnetka will still be served with the utmost care and safety. The Council was in support of the Feasibility Study's recommendation.

Trustee Ziv, seconded by Trustee Krucks, moved to authorize Village staff to pursue a contract for consolidated 911 dispatching. By roll call vote, the motion carried. Ayes: Trustees Cripe, Krucks, Rintz and Ziv. Nays: None. Absent: Trustees Lanphier and Myers.

11) Appointments. None.

12) Reports.

- a) Village President. President Greable made several announcements.
- b) Trustees. None.
- c) Attorney. None.
- d) Manager. Manager Bahan updated the Council on the building permit fee waivers for flood repairs.

13) Closed Session. Trustee Ziv moved to adjourn into Closed Session to discuss Personnel Matters, pursuant to Section 2c(1) of the Illinois Open Meetings Act. Trustee Cripe seconded the motion. By roll call vote, the motion carried. Ayes: Trustees Cripe, Krucks, Rintz and Ziv. Nays: None. Absent: Trustees Lanphier and Myers.

President Greable announced that the Council would not return to the open meeting after Executive Session. The Council adjourned into Executive Session at 9:03 p.m.

- 14) Adjournment. Trustee Cripe, seconded by Trustee Rintz, moved to adjourn the meeting. By voice vote, the motion carried. The meeting adjourned at 9:58 p.m.

Deputy Clerk

DRAFT



Agenda Item Executive Summary

Title: Approval of Warrant List

Presenter: Robert M. Bahan, Village Manager

Agenda Date: 09/06/2016

Consent: YES NO

- | | |
|-------------------------------------|-------------------------|
| <input type="checkbox"/> | Ordinance |
| <input type="checkbox"/> | Resolution |
| <input type="checkbox"/> | Bid Authorization/Award |
| <input type="checkbox"/> | Policy Direction |
| <input checked="" type="checkbox"/> | Informational Only |

Item History:

None.

Executive Summary:

The Warrant List dated August 12 - September 1, 2016 was emailed to each Village Council member.

Recommendation:

Consider approving the Warrant List dated August 12 - September 1, 2016.

Attachments:

None.



Agenda Item Executive Summary

Title: Resolution No. R-46-2016: Purchase of Two Stormwater Pumps (Adoption)

Presenter: Steven M. Saunders, Director of Public Works/Village Engineer

Agenda Date: 09/06/2016

Consent: YES NO

Ordinance
 Resolution
 Bid Authorization/Award
 Policy Direction
 Informational Only

Item History:

As a result of recent severe flooding in certain low-lying areas of Winnetka, and in an effort to provide short-term flooding relief to these areas, the Village Council provided policy direction to Village staff to research purchasing additional pumping capacity to reduce the duration of excessive flooding.

Executive Summary:

In order for additional pumping capacity to be effective, two conditions must be satisfied. First, there must be a suitable location where sufficient water can be delivered to a pump so that the pump does not short-cycle or lose prime. Second, and more important, there must be a suitable discharge location where pumped water will not cause negative downstream consequences. Currently, staff is able, under certain conditions, to locate a supplemental pumping unit at the west end of Ash Street to reduce the duration of flooding after severe rainstorms. Staff has identified two additional locations where additional pumping capacity could be beneficially located - at the west end of Spruce Street and adjacent to the Mount Pleasant Pump Station. These locations are shown in the attached map.

Staff has identified a suitable trailer-mounted 6" centrifugal pump manufactured by Thompson Pump & Manufacturing Company for \$17,618 per unit plus freight, available through General Services Administration (GSA) pricing. GSA pricing allows State, county, and local governments to take advantage of the purchasing power of the Federal government in procuring goods and services.

Resolution R-46-2016 authorizes purchase of two (2) Thompson trailer-mounted 6HT-DD-3-D2011 6" Centrifugal Trash Pumps under GSA Contract GS-07F-01401V for a total of \$35,236 plus \$1,944 for freight, for a total of \$37,180.

Recommendation:

Consider adoption of Resolution No. R-46-2016 authorizing purchase of two (2) Thompson trailer-mounted 6HT-DD-3-D2011 6" Centrifugal Trash Pumps under GSA Contract GS-07F-01401V for a total of \$35,236 plus \$1,944 for freight, for a total of \$37,180.

Attachments:

- 1) Resolution No. R-46-2016
- 2) GSA Contract GS-07F-0140V
- 3) Location map

RESOLUTION NO. R-46-2016

**A RESOLUTION APPROVING THE PURCHASE
OF TWO STORMWATER PUMPS**

WHEREAS, Article VII, Section 10 of the 1970 Illinois Constitution authorizes the Village of Winnetka ("**Village**") to contract with individuals, associations, and corporations in any manner not prohibited by law or ordinance; and

WHEREAS, the Village has appropriated funds for the purchase of stormwater pumps for use by the Department of Public Works ("**Pumps**"); and

WHEREAS, the Village has identified suitable equipment available for purchase through cooperative General Services Administration Contract Number GS-07F-0140V; and

WHEREAS, pursuant to Chapter 4.12 of the Village Code and the Village's purchasing manual, the Village Council has determined that Thompson Pump & Manufacturing Company, Inc. ("**Vendor**"), is the lowest responsible bidder for the purchase and sale of the Pumps; and

WHEREAS, the Village Council desires to purchase Pumps from Vendor in an amount not to exceed \$37,180.00; and

WHEREAS, the Village Council has determined that it is in the best interests of the Village and its residents to purchase the Pumps from Vendor;

NOW, THEREFORE, BE IT RESOLVED, by the Council of the Village of Winnetka, Cook County, Illinois, as follows:

SECTION 1: RECITALS. The Village Council adopts the foregoing recitals as its findings, as if fully set forth herein.

SECTION 2: AUTHORIZATION TO PURCHASE. The Village Council authorizes and directs the Village President, the Village Manager, and the Village Clerk to execute and attest, respectively, on behalf of the Village, all documents approved by the Village Attorney and necessary to purchase the Pumps from Vendor in an amount not to exceed \$37,180.00.

SECTION 3: EFFECTIVE DATE. This Resolution shall be in full force and effect from and after its passage and approval according to law.

[SIGNATURE PAGE FOLLOWS]

ADOPTED this 6th day of September, 2016, pursuant to the following roll call vote:

AYES: _____

NAYS: _____

ABSENT: _____

ABSTAIN: _____

Signed

Village President

Countersigned:

Village Clerk



Corporate Headquarters
1496 Herbert Street
Port Orange, FL 32129
Tel: 386-767-7310
Fax: 386-761-0362
www.thompsonpump.com

August 30, 2016

Quote #: RS-TPM-345

Mr. Steve Saunders
Director of Public Works/Village Engineer
Village of Winnetka
510 Green Bay Road
Winnetka, IL 60093
Tel: (847) 716-3534
ssaunders@winnetka.org



Good day Mr. Saunders,

As you have discussed with Robert, per your recent request attached is your quotation on model 6HT-DDST-3-D2011 from our GSA contract [GS-07F-0140V](#), please see the details below.

With its heavy-duty cast-iron construction, ability to self-prime when filled with water, and re-prime automatically, this trash pump leads the industry in construction, industrial and wastewater applications. The 6HT-DDST-3-D2011 provides flow rates up to 1,430 gpm and can handle spherical solids up to 3"

Estimated Freight: From Port Orange, FL to Winnetka, IL **\$972.00**

We will be in touch to follow up with you tomorrow, but should you have any questions or concerns please don't hesitate to contact me immediately.

We appreciate the opportunity to do business with you.

Thank You,

Rico Saldana
Inside Sales
Thompson Pump & Manufacturing
(386) 944-4198
RSaldana@thompsonpump.com



Corporate Headquarters
1496 Herbert Street
Port Orange, FL 32129
Tel: 386-767-7310
Fax: 386-761-0362
www.thompsonpump.com

SALES QUOTE – ALL PRICING IS IN NET USD

Item #1

Job requirements: General utilization; no specific duty requirement

GSA Net Price
\$17,114.00

6" Trailer Mounted Self-Priming (Wet Prime) Trash Pump

Thompson Model: 6HT-DDST-3-D2011

Max. Flow: 1,430 gpm; Max Head: 104' TDH; Max Solids: 3" spherical

- Pump:** 6" x 6" Centrifugal, cast iron, Class 30 construction.
- Seal:** Grease lubricated run-dry seal w/ tungsten carbide faces.
- Priming:** Wet Prime; fill the casing with water to start pumping.
- Fittings:** Thompson 6" Galvanized Ball & Socket. Camlock fittings optional.
- Impeller:** 9.74" Dynamically balanced, 2 vane, non-clogging, semi-open, ductile iron, with rear equalizing vanes reducing axial loading.
- Engine:** Deutz D2011L03I, 32-hp max, Interim Tier IV diesel 4-cylinder, 4- cycle, direct injected.
- Control:** Thompson standard panel w/ key switch, tach, hourmeter, & safety shutdowns.
- Mounting:** Industrial steel integral frame with 45-gallon fuel cell.
- Trailer:** Single axle, suspension, tow bar, pintle hitch, safety chains, front and rear support stands, fenders, light package and a cushioned suspension.
- Standard:** Lifting bail provision, locking provision for battery and fuel cap, integral fuel tank cleanouts and drain ports, 6" suction strainer, fuel gauge, and a diagnostic fuel gauge.

Open Market Options

Hose & Accessories

- 6" x 20' Green PVC suction hose with Ball X Socket Fittings \$289.00
- 6" x 50' Blue Layflat Discharge hose with Ball X Socket Fittings \$215.00

TERMS

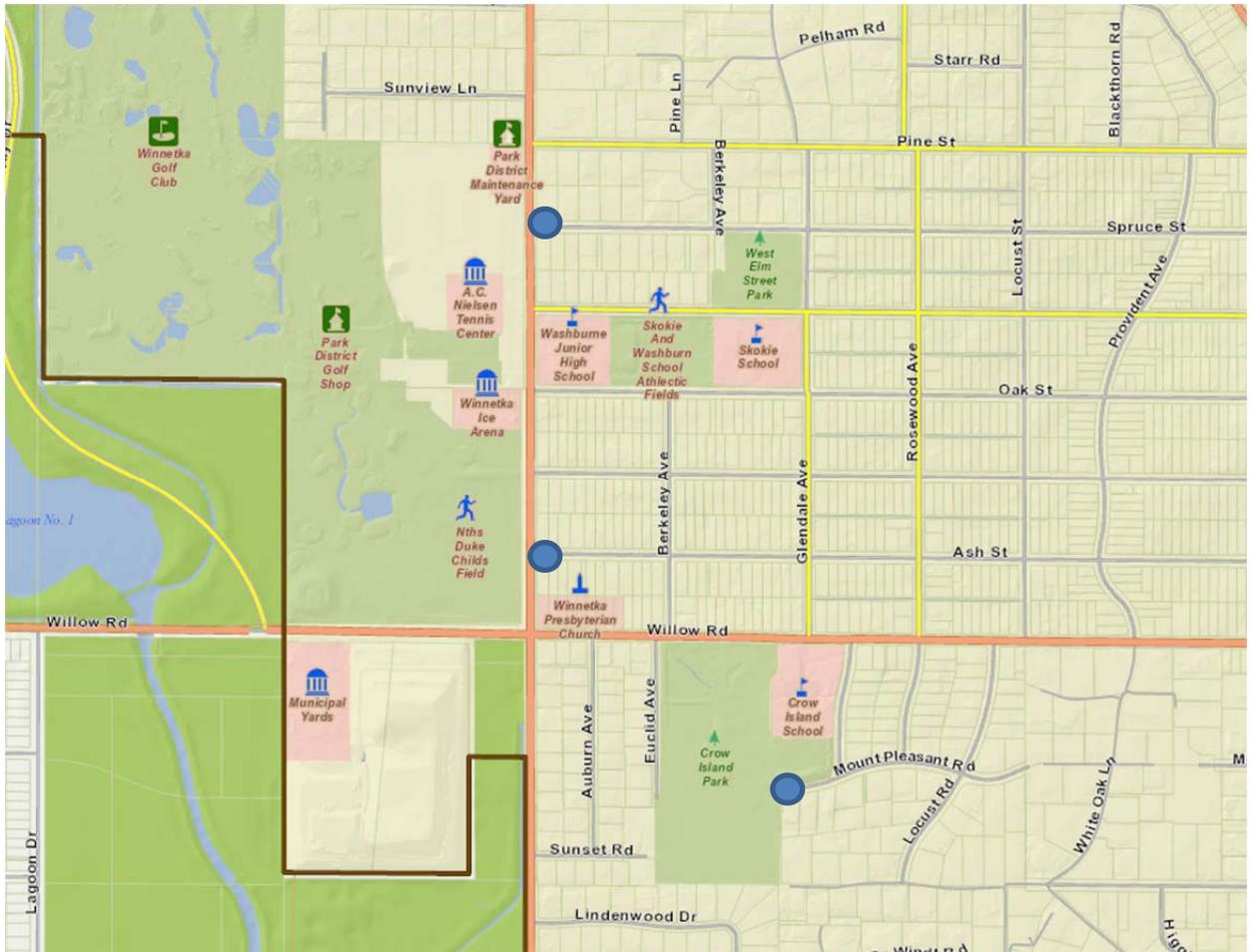
- FOB: Port Orange FL, USA.
- TERMS: Net 30 Days w/a/c.
- WARRANTY: One (1) year limited.
- DELIVERY: Six to Eight (6-8) weeks or sooner after acceptance of a hard copy purchase order regarding the unit only.
- The customer is responsible for any and all taxes, tariffs or associated fees in the sale and transport of equipment purchased or rented. Thompson Pump to arrange freight.
- Estimated freight rate: Any and all freight rates that may be quoted are for *budgetary purposes only*. All freight rates are an *estimate* only and are not binding to Thompson Pump.
- Please provide a tax exemption certificate at time of order if applicable.
- No penalties or liquidated damages are acceptable.
- Cancellation of this order or return of any equipment purchased may result in re-stocking fees.
- Quote validity: 30-days.

Note:

- **All pumps are tested utilizing Hydraulic Institute® standards.**
- **Thompson Pump is a member in good standing with the Contractor's Pump Bureau, the governing association of U.S. pump manufacturer standards.**
- **ISO 9001:2008 certified.**



SUPPLEMENTAL PUMPING LOCATIONS





Agenda Item Executive Summary

Title: 5 Indian Hill Road, Subdivision and Zoning Variation: Policy Direction

Presenter: Michael D'Onofrio, Director of Community Development

Agenda Date:

09/06/2016

Consent:

YES

NO

Ordinance

Resolution

Bid Authorization/Award

Policy Direction

Informational Only

Item History:

The Council first considered the proposed subdivision for policy direction at its July 5, 2016 meeting (see July 5, 2016 Agenda, pp. 20-199).

Executive Summary:

The owner of 5 Indian Hill Rd. has submitted an application seeking approval of a land subdivision which would divide the existing single lot measuring 85,290 s.f. (1.96 acres) into two (2) lots, measuring 41,500.82 s.f. (Lot 1 – west lot) and 43,789.18 s.f. (Lot 2 – east lot).

In addition to the subdivision application, the owner has submitted an application seeking approval of a variation by Ordinance from Section 17.30.010 [Lot Area, Shape and Dimensions] of the Winnetka Zoning Ordinance to permit Lot 2 of the proposed Gill Subdivision to have a minimum lot depth of 156.62 ft., whereas a minimum of 200 ft. is required, a variation of 43.38 ft. (21.69%).

The request was first heard at the Plan Commission (PC) meeting October 21, 2015, but was continued, in part to allow staff to provide additional background information relating to the frequency of requests for relief from land subdivision standards. The PC continued its consideration of the request at its meeting January 27, 2016. With a vote of 6 to 2, with one abstention, the PC voted to recommend denial of the proposed subdivision, including the requested relief from the subdivision standard prohibiting the creation of side lot lines abutting rear lot lines.

Subsequent to the January PC meeting, the petitioners submitted a revised application. The only change to the proposal was an increase in lot area for Lot 1 (west). The previous configuration of the proposed subdivision would have created a nonconformity with respect to the existing gross floor area (GFA) for Lot 1. However, the increase in lot area eliminated the need for a GFA variation.

The Zoning Board of Appeals considered the variation application at its meeting March 14, 2016. With a vote of 4 to 1, the Board recommended denial of the variation from the minimum required lot depth.

As mentioned above, this matter was before the Village Council for policy direction at its July 5, 2016 meeting. At that time the Council asked the applicant to meet with the neighbors in an attempt to find an alternative the neighbors could support. This meeting took place on August 24 and the attempt to come up with an acceptable plan was unsuccessful.

Recommendation:

Provide policy direction.

Attachments:

- Agenda Report
- Attachment A: Summary of neighborhood meeting
- Attachment B: Plat of Survey

AGENDA REPORT

TO: Village Council

PREPARED BY: Michael D'Onofrio, Director of Community Development

SUBJECT: Proposed Subdivision of 5 Indian Hill Rd.

DATE: August 29, 2016

REF: July 5, 2016 Council Mtg. pp. 20-199

At the conclusion of the Council's consideration of the proposed subdivision at the July 5, 2016 meeting, the Council asked the applicant, Dan and Debra Gill, to meet with the neighbors in an attempt to find an alternative the neighbors could support.

This neighbor meeting took place on Wednesday, August 24th. A detail of this meeting is provided in a letter from the applicant's attorney, Hal Francke, dated August 30, 2016 (Attachment A). According to Atty. Francke, nine neighbors attended the meeting, along with him, the Gill's, and their architect. At the meeting, an alternative plan was proposed. The alternative would move the lot line between the two proposed parcels, east 30 feet (see p. 7 of Attachment A). This would reduce the size of proposed Lot 2 (east lot) from 43,789 s.f. to 36,890 s.f. and increase proposed Lot 1 (west lot) from 41,500 s.f. to 48,400 s.f. According to Atty. Francke, this change would reduce the maximum allowable size of a newly constructed home on Lot 2, by approximately 1,500 s.f. Additionally, the shift in the property line would improve the view corridor between the two lots, for the owners of 2 Indian Hill Road.

It should be noted that with the proposed plan revisions, the two zoning variations (minimum lot depth and side yard abutting a rear yard) would still be necessary.

In his letter, Atty. Francke concluded that "...the attempt to resolve this matter on terms acceptable to all was unsuccessful."

In addition to the August 30th correspondence from Atty. Francke, a second attachment (B), which is a plat of survey of the property, has been included in this packet.

Introduction

The owner of 5 Indian Hill Rd. has submitted an application seeking approval of a land subdivision which would divide the existing single lot measuring 85,290 s.f. (1.96 acres) into two (2) lots, measuring 41,500.82 s.f. (Lot 1 – west lot) and 43,789.18 s.f. (Lot 2 – east lot).

In addition to the subdivision application, the petitioners have submitted an application seeking approval of a variation by Ordinance from Section 17.30.010 [Lot Area, Shape and Dimensions] of the Winnetka Zoning Ordinance to permit Lot 2 of the proposed Gill Subdivision to have a minimum lot depth of 156.62 ft., whereas a minimum of 200 ft. is required, a variation of 43.38 ft. (21.69%).

Property Location

The location of the subject site is shown in Figure 1 below.

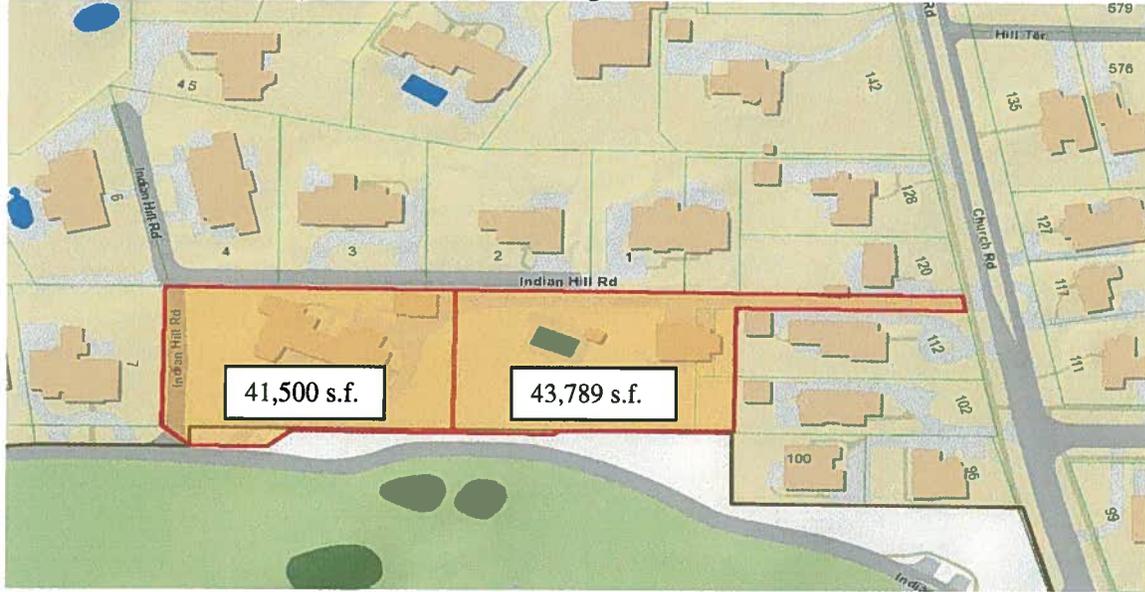


Figure 1 - Proposed subdivision

Description of subdivision and neighborhood context

The subject parcel is located in the R-2 zoning district, which requires a minimum lot area of 24,000 s.f. for interior lots and 25,200 s.f. for corner lots. As proposed, the two-lot subdivision would comply with the minimum lot area standard of the Zoning Ordinance, exceeding the minimum lot area by 82% (east lot) and 64% (west lot).

The subject parcel is one of thirty-eight (38) similarly-sized lots located south of Hill Rd. and west of Church Rd. This area of R-2 zoning is highlighted green in Figure 2.



Figure 2 - R-2 zoning district boundaries

The highlighted R-2 zoning district is located at the southerly edge of the Village, adjacent to the Indian Hill Club, which is located outside the Village in unincorporated Cook County. The highlighted area includes a wide range of different lot sizes, with the 38 lots highlighted ranging from a size of 10,045 s.f. on the small end to the largest lot (the subject parcel) measuring 85,290 s.f. Attachment B (ref: July 5 mtg.) lists the lot area for each of the 38 parcels in the R-2 district highlighted above.

In addition to a wide variation of lot sizes, this particular section of R-2 zoning is improved with an irregular, largely curvilinear street layout, contributing to a concentration of irregular, non-rectangular lots in contrast with a more regular grid layout to the north and east.

Variations required under subject application

The proposed subdivision requires relief from not only the Zoning Ordinance, but the Subdivision Ordinance as well. Table 1 below outlines the status of various subdivision and zoning standards for the proposed subdivision, highlighting those items noted as being noncompliant and requiring relief.

Table 1 – Subdivision and Zoning Ordinance Compliance

	Code Requirement	5 Indian Hill subdivision	Status
Zoning Ordinance requirements [17.30.010 & .020 Village Code]			
A. Minimum lot area <i>(interior lot)</i>	24,000 s.f.	43,789 s.f.	Complies
Minimum lot area <i>(corner lot)</i>	25,200 s.f.	41,500 s.f.	Complies
B. Minimum lot width <i>(interior lot)</i>	100 ft.	244.09 ft.	Complies
Minimum lot width <i>(corner lot)</i>	115 ft.	165.15 ft.	Complies
C. Minimum lot depth <i>(proposed east lot)</i>	200 ft.	156.62 ft. <i>(measured north to south)</i>	Does not comply – requires zoning variation
Minimum lot depth <i>(proposed west lot)</i>	200 ft.	251.29 ft. <i>(measured east to west)</i>	Complies
D. Rectangular buildable area/rectangular lot area	16,335 s.f. rectangular area with a minimum dimension of 90 ft.		Complies
E. Existing improvements Lot area must be adequate to support existing improvements.	In addition to minimum lot area standards, lot sizes must be adequately sized to allow existing improvements to comply with density limits.		Complies

F. Existing improvements Lot configuration must not create nonconforming setbacks.			Complies
Subdivision Ordinance lot requirements [16.12.010.D Village Code]			
A. Side lot lines to be perpendicular to street lines			Complies
B. No side lot line shall abut another lot's rear lot line.		See Fig. 4	Does not comply – requires variation by Plan Commission

Compliance with Zoning Standards

All subdivisions are evaluated for compliance with basic minimum quantitative measures including minimum lot area, lot width, and lot depth. The proposed subdivision does not comply with one provision of Section 17.30.010 of the Zoning Ordinance related to lot dimensions. Lot 1 (west lot) would provide a conforming depth of 251 ft., while Lot 2 (east lot) would result in a nonconforming depth of 160 ft., whereas a minimum depth of 200 ft. is required. Figure 3 depicts the measurement of each lot's depth. Under the Zoning Ordinance, lot depth is measured from the "front street line" to the farthest point from that line.

It is worth pointing out, in this particular subdivision, each lot's depth is measured with a different orientation (east-west versus north-south) due to the location of abutting streets and due to the fact the west lot is a corner lot with two street frontages.

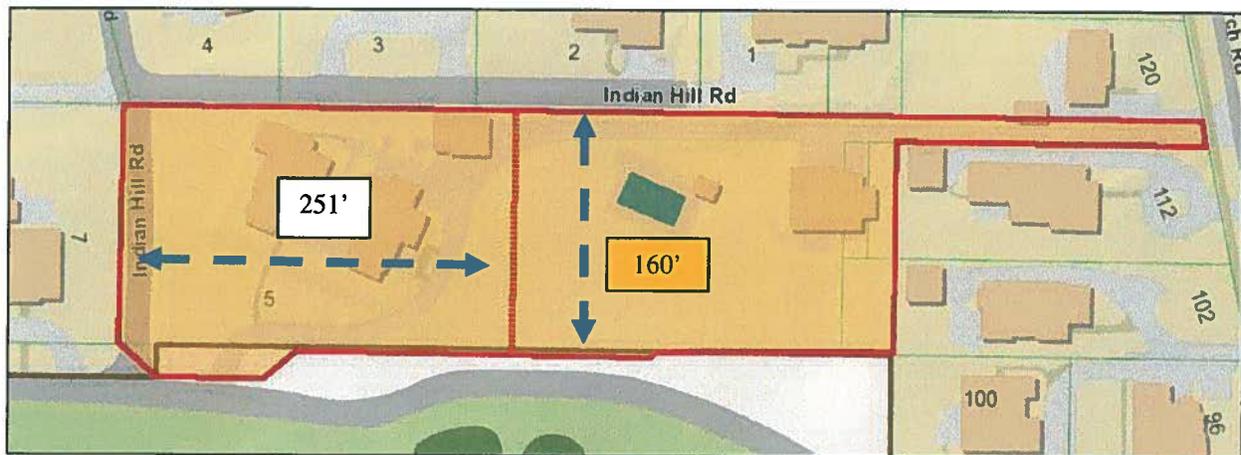


Figure 3 - Lot depth measurement

Existing Zoning Nonconformities

In the case of the proposed subdivision, the following zoning nonconformities exist and will continue to exist:

1. The existing residence at 5 Indian Hill, located on proposed Lot 1, is setback 5.2 ft. from the north lot line, whereas a minimum front yard setback of 50 ft. is required;
2. The existing detached garage at 5 Indian Hill on proposed Lot 1 is setback 0.99 ft. from the north lot line, whereas a front yard setback of 50 ft. is required;
3. The existing swimming pool on proposed Lot 2 is setback 37 ft. from the north lot line, whereas a front yard setback of 50 ft. is required;
4. The existing coach house on proposed Lot 2 is setback 12.48 ft. from the east lot line, and 36.47 ft. from the north lot line, whereas a front yard setback of 50 ft. is required.

Table 2 below describes the allowable building sizes and required setbacks of the existing single lot and compares them to the proposed two-lot subdivision. The existing improvements on the proposed lots would comply with the maximum permitted building size and lot coverage.

Table 2 – Comparison of zoning density and setback requirements: Existing vs. Proposed

Zoning standards	Existing single lot 80,707.42 s.f. (excludes narrow access way)	Proposed Lot 1 (West) 41,500.82 s.f.	Proposed Lot 2 (East) 39,206.6 s.f.
1. Minimum Front Setback	50 ft. (west)	50 ft. (west)	50 ft. (north)
2. Minimum Corner Setback	50 ft. (north)	50 feet (north)	-----
3. Minimum Side Yard	12 ft. (south)	12 ft. (south)	12 ft.
4. Required Total Side Yards	-----	-----	73.23 ft.
5. Minimum Rear Yard	25 ft. (east)	25 ft. (east)	24.09 ft. (south)
6. Maximum Gross Floor Area	20,377.71 s.f.	11,360.19 sf.	10,832.52 s.f.
7. Maximum total building footprint / roofed lot coverage	20,176.85 s.f.	10,375.2 s.f.	9,801.65 s.f.

8. Maximum total impermeable lot coverage	40,353.71 s.f.	20,750.41 s.f.	19,603.3 s.f.
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Compliance with Subdivision Standards

Section 16.12.010(D) (6) of the Village Subdivision Ordinance stipulates that subdivisions shall not “result in the creation of one or more lots having side lot lines abutting rear lot lines”. Generally speaking, this standard was adopted to place limits on subdivisions such as the one depicted in Figure 4 below. The subdivision in Figure 4 was approved by the Village, but later felt to have disrupted a regular “grid” form of the neighborhood by placing structures closer to neighbors than had previously been permitted. The prohibition of “side lot lines abutting rear lot lines” was the approach used to place limits on such practices.



Figure 4 Example of “side yards abutting rear yards”

The proposed Gill Subdivision would result in two such “side yards abutting rear yards,” as follows:

1. As proposed, the rear (east) lot line of Lot 1 abuts the side lot line of Lot 2;

-
2. In addition, the proposed subdivision would result in the creation of the side (east) lot line of Lot 2 abutting the rear lot line of the adjacent parcels to the east at 102 Church Rd. and 112 Church Rd.

Section 16.12.010 (F) of the Subdivision Ordinance states that “Whenever the land to be subdivided is of such unusual size or shape or is surrounded by such development or unusual conditions that the strict application of this section would result in real difficulties and substantial hardships or injustices, the Plan Commission may vary or modify such requirements so that the owner is allowed to develop the land in a reasonable manner; provided that, public health, safety, welfare and convenience are protected.”

Related to the existing zoning nonconformities noted on pages 3 and 4 of this report, Section 16.12.010.D of the Subdivision Ordinance requires the Plan Commission to determine whether such existing nonconformities, in the context of the proposed subdivision, will result in a material increased adverse impact upon the public health, safety or welfare.

Subdivision and Variation History

A staff memorandum dated November 12, 2015 (Attachment C of July 5, 2016 mtg.) is an analysis of fifty (50) subdivision applications filed from 1990-2015, and describes the seventeen (17) cases which incorporated one or more forms of such relief, representing 34% of the total of all subdivisions.

The memo provides a breakdown of the type of variations requested (lot width, lot area, etc.) as well as their final disposition. Key findings in the memo included the following:

- A. Five (5) requests for zoning relief came from lot consolidation requests, involving instances where lot sizes were increased. All five requests were based on a unique feature of the Zoning Ordinance that increases setback requirements as lot area increases – in each case existing structures became nonconforming with a setback requirement even as lot size and lot width increased. All five requests were approved. Due to the unique combination of zoning relief resulting from an increase in lot size, such requests for relief might best be considered a unique circumstance.
- B. Five (5) cases involved requests for relief from minimum lot area requirements, with one (1) approved for a nominal reduction in lot area. The remaining cases were either withdrawn (3 cases) or denied (1 case).
- C. While no requests involved relief from the minimum lot depth standard (as in the current application), three (3) requests for zoning relief involved lot width requirements, a somewhat similar “dimensional” standard. Two (2) requests for lot width relief were approved and one (1) withdrawn.
- D. Rectangular lot area - Two (2) cases involved request for zoning relief from “rectangular lot area requirements. One case was denied and one was withdrawn.

Seven (7) requests were for variation from subdivision standards, primarily for cases in which side lot lines were not perpendicular to the street, as is often the case with irregularly shaped lots. All such requests were approved.

Property History

The existing residence at 5 Indian Hill was built in 1922. Subsequent building permits were issued in 1955 to construct a one-story addition to the coach house and in 1999 to remodel and build an addition to the main residence.

There is one previous zoning case for this property. In 1999 the Village Council adopted Ordinance M-597-99 granting a variation to permit new window openings in the nonconforming north building wall.

The petitioners purchased the property in 1999.

Recommendation of Advisory Boards

The request was first heard at the Plan Commission (PC) meeting October 21, 2015 (Attachment D of July 5, 2016 mtg.), but was continued, in part to allow staff to provide additional background information relating to the frequency of requests for relief from land subdivision standards. The PC continued its consideration of the request at its meeting January 27, 2016 (Attachment D of July 5, 2016 mtg.). With a vote of 6 to 2, with one abstention, the PC voted to recommend denial of the proposed subdivision, including the requested relief from the subdivision standard prohibiting the creation of side lot lines abutting rear lot lines.

Subsequent to the January PC meeting, the petitioners submitted a revised application. The only change to the proposal was an increase in lot area for Lot 1 (west). The previous configuration of the proposed subdivision would have created a nonconformity with respect to the existing gross floor area (GFA) for Lot 1. However, the increase in lot area eliminates the need for a GFA variation.

The Zoning Board of Appeals considered the variation application at its meeting March 14, 2016. With a vote of 4 to 1, the Board recommended denial of the variation from the minimum required lot depth (Attachment E of July 5, 2016 mtg.).

Council Consideration and Action

Due to the negative recommendations from both advisory boards, the proposed subdivision is before the Council for policy direction.

Recommendation

Provide policy direction.

Attachment

Attachment A: Summary of neighborhood meeting.

Attachment B: Plat of Survey

ATTACHMENT A

MPSLAW

MELTZER, PURTILL & STELLE LLC

ATTORNEYS AT LAW

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TELEPHONE (847) 330-2400
FAX (847) 330-1231

300 SOUTH WACKER DRIVE
SUITE 3500
CHICAGO, ILLINOIS 60606-6704
TELEPHONE (312) 987-9900
FAX (312) 987-9854

Direct Dial: 847-330-6068 (Schaumburg)
E-mail: hfrancke@mpsllaw.com

August 30, 2016

Mr. Michael D'Onofrio
Director of Community Development
Village of Winnetka
510 Green Bay Road
Winnetka, IL 60093

Re: 5 Indian Hill Road / Meeting with Neighbors

Dear Mr. D'Onofrio:

On Wednesday evening, August 24th, our clients, Dan and Debra Gill, met at 5 Indian Hill Road with a number of neighbors to see if a subdivision proposal could be identified which would be considered acceptable to the neighborhood. The meeting was held pursuant to the suggestion of the members of the Village Council which was made at the July 5th Council meeting.

On August 2nd, Mrs. Gill personally placed hard copies of the enclosed meeting invitation in the mailboxes of the following neighbors:

Ernie MacVicar, Butch MacVicar and Janice MacVicar (1 Indian Hill Road)
Dana and Laura Connell (2 Indian Hill Road)
David and Karen Hawkins (3 Indian Hill Road)
Davis and Karen Roenisch and Mignon Buehler (4 Indian Hill Road)
Brad and Lisa Tank (6 Indian Hill Road)
Barb and Kevin Sheridan (7 Indian Hill Road)
Thomas M. Lillard III and Cindy Lillard (100 Church Road)
Jim and Connie Aslaksen (102 Church Road)
Baird and Patrice Smart (112 Church Road)
Nan Martin and Dr. Pat Logan (116 Church Road)
Laurie Kaplan Singh and Rashtal Singh (120 Church Road)

I believe that nine neighbors attended the meeting--Dana and Laura Connell, Janice MacVicar, Butch MacVicar, Kevin Sheridan, Dave Hawkins, Cindy Lillard, Nan Martin and Dr. Pat Logan—although one or more of those names may be incorrect. Dan Gill, Joanne Hudson (the Gills' real estate broker), Lesa Rizzolo (the Gills' architect), and I attended the meeting on behalf of the ownership of the property at 5 Indian Hill Road. The meeting lasted approximately one hour.

At the outset of the meeting Dan Gill asked the neighbors to detail the concerns they had with the proposed subdivision. The neighbors said they thought their concerns and their objections to the proposed subdivision, both legal and practical, had been adequately detailed in the letters and emails they had sent to the Village and in their public testimony and that those concerns and objections remained unchanged. The legal objections were generally based on the assertion that the subdivision

Michael D'Onofrio
August 30, 2016
Page 2 of 4

was not allowed under Village ordinances. Mr. Gill responded by saying that those ordinances contemplated a legal process for the consideration of his proposed subdivision, that we were in the midst of pursuing that process, and that the point of the meeting was to see if that process could be concluded by arriving at a compromise that would work for all parties. At that point, Mr. Gill expressed his desire to find a subdivision plan that would address the concerns of the neighbors in a reasonable manner and in a manner that would be fair to the Gills as property owners.

After Mr. Gill spoke, Mr. Connell, who is an attorney, said he was surprised to see that I, the Gills' attorney, was attending the meeting since he thought this was going to be a meeting of neighbors only. I explained that I was there so that I could report back to you on the outcome of the discussions and to assist, to the extent possible, in helping the Gills and the neighbors arrive at a compromise solution, explaining to those present that my experience with the Village was that the Village Council preferred to see consensus among competing neighbor interests, if and when that is achievable. I then offered to leave the meeting if that is what the neighbors preferred, but in the end they did not request that I do so.

Mr. Gill then presented a compromise proposal that contemplated moving the western boundary of proposed Lot 2 approximately 30 feet to the east and reducing the size of the lot from approximately one acre (43,789 square feet) to .85 of an acre (36,890 square feet). This proposal reduces the size of Lot 2 for Gross Floor Area purposes from 39,206 square feet to 32,308 square feet and the maximum Gross Floor Area that can be constructed on Lot 2 from 10,832 square feet to approximately 9,246 square feet (or approximately 6,000 square feet if a buyer of Lot 2 elects to retain the existing coach house and pool house on the property). As you know, a newly constructed house on Lot 2 would have to be setback a minimum of 30 feet from the western lot line and a minimum of 50 feet from the northern lot line of such lot.

The proposal that is currently before the Village and this compromise proposal are depicted on the enclosed drawings that Ms. Rizzolo prepared and distributed at the meeting. You should know that, prior to the start of the meeting, we also demarcated the location of the western boundary of Lot 2, as described in the Gills' pending application, and its location as it was being newly proposed by the placement on the property of bright orange highway-type cones.

I told the neighbors that to implement this revised subdivision plan, the same two variations from the Subdivision Code would be needed—the variation for lot depth and the variation for a side yard-to-rear yard condition. No increase in the scope of those variations and no new or additional zoning ordinance or subdivision code variations would be needed. However, the compromise proposal would result in a side yard-to-rear yard condition on the eastern boundary of the property (that is, where the eastern side yard of the proposed Lot 2 would abut the rear yards of the properties at 112 Church Road and 102 Church Road) that is reduced from the previously shown 62 feet to 55 feet. As you know, this would exceed the minimum required separation between homes on the properties if a standard 50-foot rear yard-to-rear yard condition were established.

The primary goal of the compromise proposal that Mr. Gill presented was to reduce the mass of a newly constructed home on the proposed Lot 2 and shift it to the east to protect the "view corridor" of the Connells. The Connells, however, rejected this compromise proposal and reiterated that they do not want to see any new home constructed on the property. Other neighbors expressed support for this position. Later in the discussion, Mr. Connell stated that he might be willing to accept a subdivision of the property if the only purpose is to allow the coach house to be sold and conveyed as a separate residence.

Mrs. MacVicar, who lives at the far eastern end of the portion of Indian Hill Road that abuts the 5 Indian Hill Road property on the north, stated that under the right conditions she would not object to the construction of a new home on a newly created Lot 2. I believe she also said that she would be trying to do the same thing the Gills are trying to do if she owned the property but it might have been someone else who made that comment.

Michael D'Onofrio
 August 30, 2016
 Page 3 of 4

A summary of the other objections to the proposed subdivision that were voiced at the meeting, and comments made in response to these objections, are noted below.

1. Construction of a new house would exacerbate existing flooding problems in the area.

In response, Mr. Gill pointed out that there have not been any flooding issues on the property, the property sits on a hill, and a new home was unlikely to create a flooding problem.

2. Construction of a new house would adversely affect the neighbors' property values. Specifically, the neighbors said they were concerned that the subdivision would result in there being a second property for sale at 5 Indian Hill Road (as opposed to the single parcel of property that is on the market today) and that putting another property in the area up for sale would reduce the value of their properties.

Joanne Hudson commented that if a nice new home were constructed on the newly created lot it could actually be a positive for neighborhood property values.

3. The Connells said they were concerned that a new house would cast shadows on their property.

Mr. Gill responded by saying that this would be unlikely because a new house would sit lower on the hill than the Connells' house and it would be minimum of 100 feet away from their house.

4. Granting the two requested subdivision code variations would set a bad precedent.

Mr. Gill responded by saying that the property had been developed long before the current code and any work on the east and north end of the coach house would require a variation. I explained to the neighbors that a number of precedents already exist in the Village for resolving neighborhood conflicts such as this by conditioning a subdivision approval on a self-imposed limit on the size of a new house that might be constructed on a newly created lot and that this is what the Gills were effectively doing by reducing the size of Lot 2.

5. The legal standards for approving the two variations have not been met.

Mr. Gill responded by saying that that is what the legal process is there to resolve.

6. Construction of a new, larger house (potentially up to 9,000 square feet in size) at the coach house location would harm the view from neighboring houses and could harm the value of those homes.

In response, Mr. Gill pointed out that a new construction home would not be visible to the owners of the homes situated to the west of the Connells' home and to the west of the existing home at 5 Indian Hill Road, and that a newly constructed home would actually move farther away from and be at a lower grade than the houses situated to the east of the Connells' home and to the east and south of the existing coach house and could actually improve their views of green space. With respect to the Connells' home, we mentioned that a new home would need to be a minimum of 50 feet from the northern property line of a new Lot 2 and that any such home would be a minimum of 100 feet away from the Connells' home. We also mentioned that by moving the property line to

Michael D'Onofrio
August 30, 2016
Page 4 of 4

the east any new home would not be in a direct line of sight with the Connells' home and, in particular, its second story windows which look south.

7. It was suggested several times that the Gills should simply lower the asking price for their property so that it would sell and make the subdivision of the property unnecessary.

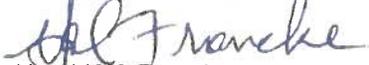
In response, Mr. Gill pointed out that their price had been lowered several times and by over one million dollars since it was first placed on the market. He also said that the market had changed and that there is less interest in larger properties now than there was when they first put their home on the market and that subdividing makes sense because it will be easier to sell two smaller properties in today's market than one large one.

In the end, the attempt to resolve this matter on terms acceptable to all was unsuccessful.

If you have any questions or would like additional information, please feel free to contact me.

Very truly yours,

MELTZER, PURTILL & STELLE LLC



Harold W. Francke

cc: Peter Friedman
Dan and Debbie Gill
Joanne Hudson
Lesia Rizzolo

August 2, 2016

Dear Neighbors,

As a follow-up to our recent appearance before the Village Council, Dan and I would like to invite you to a meeting to discuss your concerns about our proposed subdivision and possible changes to our plan to address those concerns.

We would like to propose the following three dates and times for this meeting, and set the meeting for the date and time which works best for the majority of you:

Monday evening August 8th at 7:00pm
Sunday afternoon August 14th at 4:00pm
Wednesday evening August 24th at 7:00pm

The meeting will take place at 5 Indian Hill.

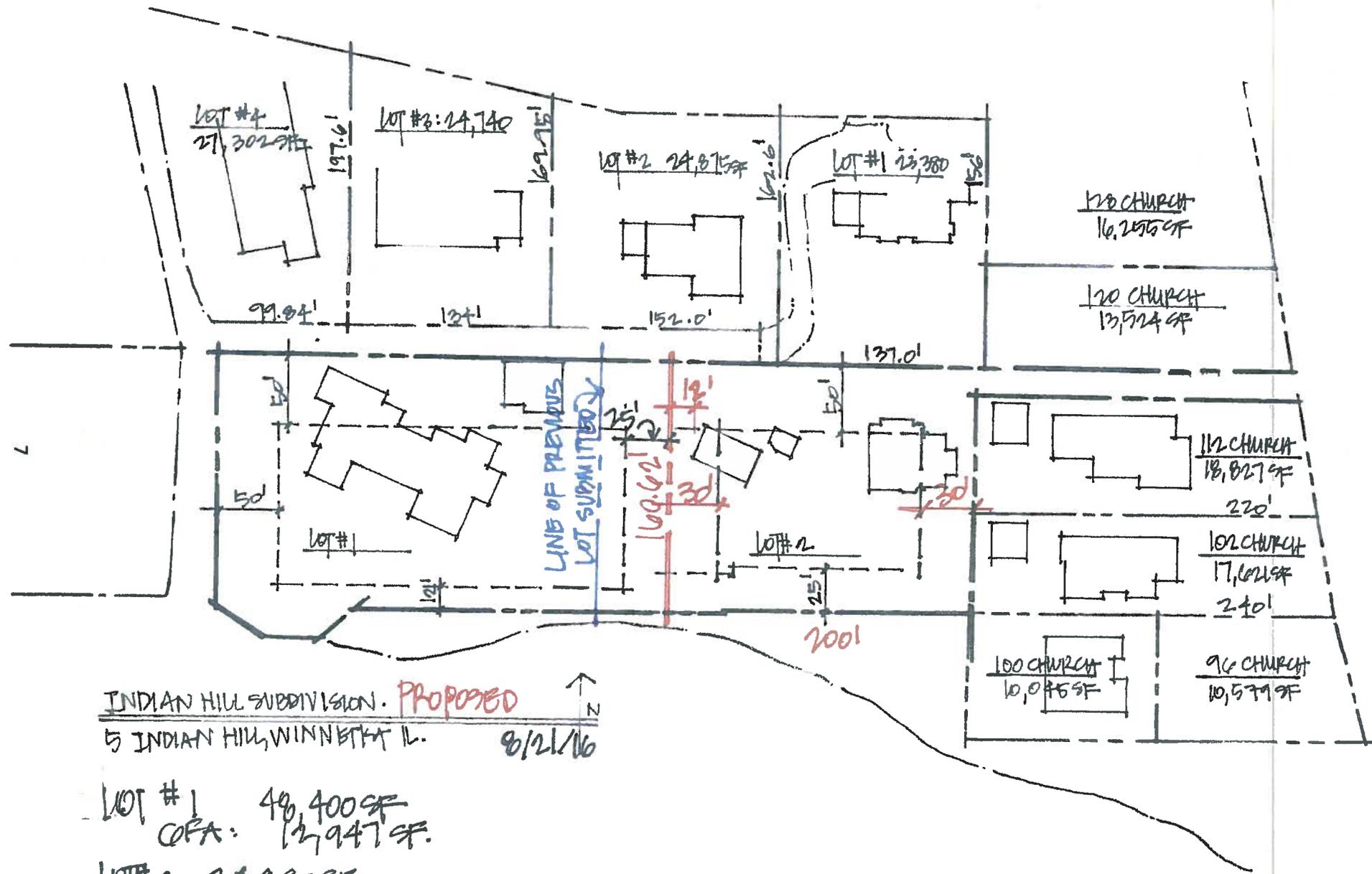
If you could get back to me as soon as possible with your preferences, we would greatly appreciate it.

Thank you in advance.

Sincerely,

Debbie Gill

Dgdg2@comcast.net



INDIAN HILL SUBDIVISION. PROPOSED
 5 INDIAN HILL, WINNETKA IL. 8/21/16

LOT #1 48,400 SF
 CFA: 12,947 SF

LOT #2 36,890 SF
 32,308 SF (FOR CFA)
 CFA ALLOWED: 9,245.8 SF
 SIDE YARD SETBACK: 30'

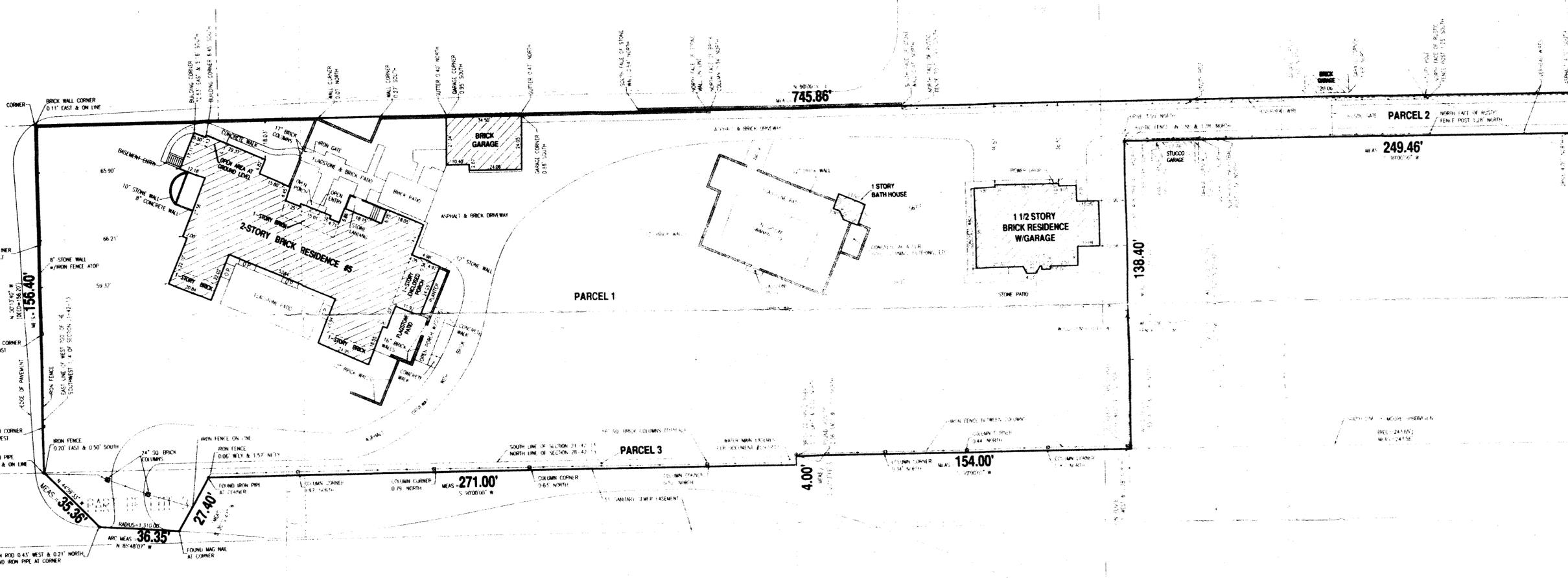
PLAT of SURVEY

Legal Description:
PARCEL 1: The East 500' of the West 1200' of that part of the South 20 acres of the Southwest Quarter of Section 21, Township 42 North, Range 13, East of the Third Principal Meridian, described as follows: Beginning at a point 172.7 feet South of the Northwest corner of said South 20 acres running thence South along the West line of said 20 acres, 156.20 feet, more or less, to the Southwest corner of said 20 acres; thence East along the South line of said 20 acres, 1470.15 feet, more or less, to the center of Church Road; thence Northerly along said center line of Church Road, 158.97 feet; thence West along a line parallel with the South line of said 20 acres, 1440.57 feet, more or less, to the place of beginning;

PARCEL 2: The North 18 feet (measured on the West line) of that part lying East of the West 1,200' of that part of the South 20 acres of the Southwest Quarter of Section 21, Township 42 North, Range 13, East of the Third Principal Meridian, described as beginning at a point 172.7 feet South of the Northwest corner of said South 20 acres; thence South along the West line of said 20 acres, 156.2 feet to the Southwest corner of said 20 acres; thence East along the South line of said 20 acres, 1,470.15 feet to the center of Church Road; thence Northerly along the center line of said Church Road, 158.97 feet; thence West along line parallel with the South line of said 20 acres, 1,440.57 feet to the place of beginning, said 18 feet being described as beginning at the intersection of center line of said Church Road with a line parallel to the South line of said 20 acres; said parallel line intersecting the West line of said South 20 acres at a point 190.7 feet South of the Northwest corner of said South 20 acres; thence West on said parallel line to the East line of the West 1,200 feet aforesaid; thence North and parallel to the West line of said South 20 acres, 18 feet; thence East on a line parallel to the South line of said South 20 acres to the center line of said Church Road; thence Southerly along the center line of said Church Road to the place of beginning;

PARCEL 3: That part of Lot 3 in Owner's Subdivision of Lot 1 of Indian Hill Sub. No. 1 of parts of Sections 21, 28, and 29, Township 42 North, Range 13, East of the Third Principal Meridian, Plat Document 7751931 to wit: That part of said Lot 3 which lies South of the North line of Section 28 aforesaid and East of the West 700 feet of said Section 28 excepting from the premises above described that portion which lies Westerly and Southerly of the following described straight line: Beginning at the Northwest corner of premises first described; thence Southeasterly to point of intersection with the South line of said premises first described with a straight line drawn South and at right angles from a point in said North line of said Section 28 which said last mentioned point is 25 feet East of the Northwest corner of said premises first described, all in Cook County, Illinois.

Commonly known as: **5 Indian Hill Road, Winnetka, Illinois.**



...or is shown or noted hereon
 ...vided to us by the client, and does not guarantee ownership, and should
 ...r Certificate of Title.
 ...and easements may or may not be shown, check your Deed, Abstract,
 ...r responsibility is assumed by Surveyor.
 ...same and report any discrepancy at once
 ...decimal parts thereof, no dimension is to be assumed by scaling

JHR & COMPANY, INC.
 SURVEYORS ESTABLISHED 1911
 840 CUSTER AVENUE, EVANSTON, ILLINOIS 60202
 TEL: (847) 864-6315 / FAX: (847) 864-9341
 E-MAIL: SURVEYOR@JHRSURV.COM

ALL ROAD EVANSTON MARCH 16, 20 15
 334 ORDERED BY DEBBIE GILL

FIELD MEASUREMENTS COMPLETED MARCH 16, 20 15
 STATE OF ILLINOIS
 COUNTY OF COOK

This is to certify that a survey of the above described property was performed under my supervision and that the above plat correctly represents said survey. This professional service conforms to the current Illinois Minimum Standards for a boundary survey.

By *Raymond R. Hansen* Dated April 22, 20 15
 Raymond R. Hansen
 Illinois Professional Land Surveyor No. 035-002542
 License Expiration Date 11/30/16





Agenda Item Executive Summary

Title: Water Main Replacement Plan and Water Rate Study

Presenter: Brian Keys, Director of Water & Electric

Agenda Date: 09/06/2016

Consent: YES NO

<input type="checkbox"/>	Ordinance
<input type="checkbox"/>	Resolution
<input type="checkbox"/>	Bid Authorization/Award
<input checked="" type="checkbox"/>	Policy Direction
<input type="checkbox"/>	Informational Only

Item History:

The Village's water distribution system is comprised of approximately 72 miles of water main with the majority of the system having been installed in the early 1900's. Given the age of the water distribution system, a long term, comprehensive plan for the asset's replacement and a funding strategy is necessary to ensure the long term viability of the water utility. In December 2015, the Village Council approved Resolution R-43-2015, approving an agreement with Burns & McDonnell Engineering Company for professional services. The project scope included development of a prioritization plan for the replacement of the water infrastructure, determining the appropriate rate of replacement of the existing water infrastructure, and performing a rate study of the Village's water system.

Executive Summary:

Burns & McDonnell has prepared a preliminary report entitled; "Water Main Replacement Plan and Water Rate Study" (attached), which summarizes the preliminary recommendations. During the September 6, 2016 Regular Council meeting, staff is seeking feedback and policy direction from the Village Council regarding the Water Main Replacement and financial plan. Thereafter, a full report including recommendations on cost of service and rate design will be provided to the Council with an accompanying presentation. The second presentation and full report is tentatively scheduled for the October 4, 2016 Regular Council meeting.

Recommendation:

Provide policy direction regarding the Water Main Replacement Plan and financial planning scenarios

Attachments:

- Agenda Report dated August 29, 2016
- Burns & McDonnell preliminary report entitled; "Water Main Replacement and Water Rate Study"

AGENDA REPORT

SUBJECT: Water Main Replacement Plan and Water Rate Study

PREPARED BY: Brian Keys, Director Water & Electric

REF: December 1, 2015 Council Meeting, pp. 111-233

DATE: August 29, 2016

Background:

The Village's water distribution system is comprised of approximately 72 miles of water main with the majority of the system having been installed in the early 1900's. Given the age of the water distribution system, a long term, comprehensive plan for the asset's replacement and a funding strategy is necessary to ensure the long term viability of the water utility. In December 2015, the Village Council approved Resolution R-43-2015, approving an agreement with Burns & McDonnell Engineering Company for professional services. The project scope included development of a prioritization plan for the replacement of the water infrastructure, determining the appropriate rate of replacement of the existing water infrastructure, and performing a rate study of the Village's water system.

The Consultant team is using a four step approach to achieve these goals.

- Step 1: Water Main Replacement Plan
- Step 2: Financial Planning
- Step 3: Cost of Service
- Step 4: Rate Design

Steps 1 & 2 of the project plan are completed. Burns & McDonnell has prepared a preliminary report entitled; "*Water Main Replacement Plan and Water Rate Study*" (attached), which summarizes the preliminary recommendations. During the September 6, 2016 Regular Council meeting, staff is seeking feedback and policy direction from the Village Council regarding the Water Main Replacement and financial plan. Thereafter, a full report including recommendations on cost of service and rate design will be provided to the Council with an accompanying presentation. The second presentation and full report is tentatively scheduled for the October 4, 2016 Regular Council meeting.

Preliminary Report Recommendations:

In the preliminary report, Burns & McDonnell has developed a prioritized listing of water main sections that should be replaced. The prioritized list is based on their evaluation of Village data using parameters such as: number of main breaks, time period in which main breaks occurred, break type, water main age, water main material and capacity. A replacement plan database has been developed so staff can manage and update

information on an annual basis. The proposed replacement cycle for water mains has been developed upon a 100-year cycle.

Critical Decision #1: Is the proposed cycle for water main replacement acceptable?

The Consultant evaluated several financial planning scenarios appropriate for the operating and capital needs of the Water Fund. Since the targeted replacement cycle of water mains directly impacts the financial planning analysis, the Plan was developed with input from Village staff. The proposed plan recommends phasing in replacement and funding beginning in 2017 through 2025, when a fully implemented targeted replacement program is envisioned.

To complete the targeted replacement program by 2025, three scenarios are presented for the Council's consideration. The Consultant and staff recommend Scenario #1 which incorporates consistent revenue increases over time, a loan from the general fund repaid with interest, and capping the water utility's payment in lieu of taxes to maximize funds for capital investment. Under each of the scenarios, existing water rates and annual revenues do not meet the projected need of capital investment over the next 10 years.

Critical Decision #2: What is the preferred financial planning scenario?

The Consultant and staff require direction from the Council before finalizing the cost of service study and rate design report. The cost of service analysis is tied to the selected financial plan; therefore, the values in the cost of service tables will change depending on the scenario selected. Subsequent recommendations for proposed rates and structures would include projected revenue scenario increases.

Representatives from Burns & McDonnell will be at the September 6th Regular Council meeting to present an overview of the work completed to date. Following the presentation, Village staff and the Consultant will address questions regarding the work completed to date and the next steps.

Recommendation:

Provide policy direction regarding the Water Main Replacement Plan and financial planning scenarios



Water Main Replacement Plan and Water Rate Study



Village of Winnetka

Water Main Replacement Plan and Water Rate Study
Project No. 89470

Preliminary Report
9/06/2016



Water Main Replacement Plan and Water Rate Study

prepared for

**Village of Winnetka
Water Main Replacement Plan and Water Rate Study
Winnetka, IL**

Project No. 89470

**Preliminary Report
9/06/2016**

prepared by

**Burns & McDonnell Engineering Company, Inc.
Downers Grove, Illinois**

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INDEX AND CERTIFICATION

Village of Winnetka Water Main Replacement Plan and Water Rate Study Project No. 89470

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3.0	Financial Planning Analysis	21
4.0	Cost of Service Analysis	2
5.0	Proposed Rate Design	1
6.0	Recommendations	3

Certification

I hereby certify, as a Professional Engineer in the state of Illinois, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the Village of Winnetka or others without specific verification or adaptation by the Engineer.

Claus Dunkelberg, P.E. (Illinois 062.039590)

Date: 7/15/2016

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
AWWA	American Water Works Association
BLS	Bureau of Labor Statistics
Ccf	Hundred cubic feet
CI	Cast Iron
CIP	Capital Improvement Program
CPI	Consumer Price Index
DI	Ductile Iron
IEPA	Illinois Environmental Protection Agency
EPA	Environmental Protection Agency
gpm	Gallons per minute
HDPE	High-Density Polyethylene
O&M	Operation & Maintenance Expense
Plan	Water Main Replacement Plan and Water Rate Study
PVC	Polyvinyl Chloride
SCI	Sand Cast Iron
Village	Village of Winnetka

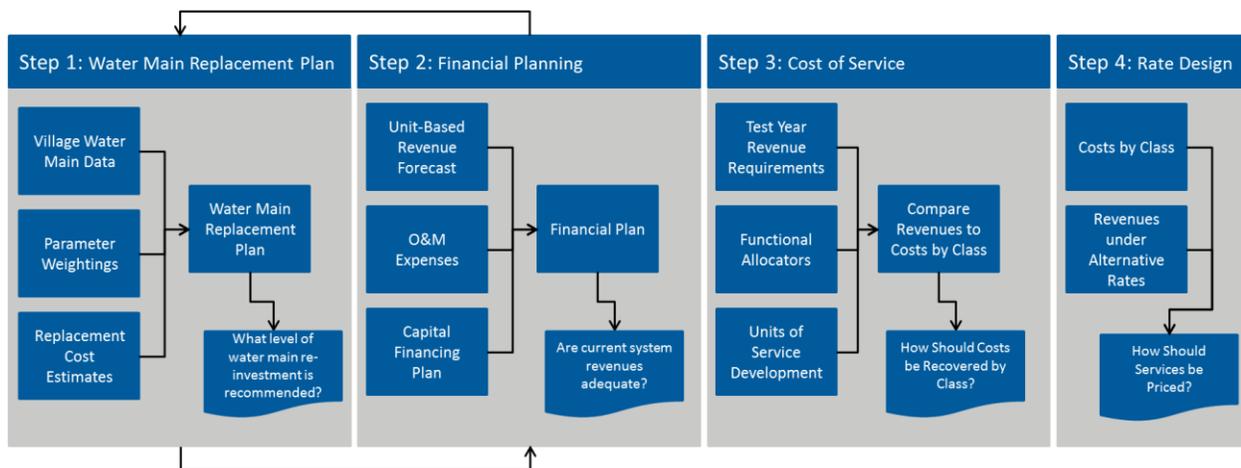
EXECUTIVE SUMMARY

Burns & McDonnell was contracted by the Village of Winnetka (the Village) to create the Water Main Replacement Plan and Water Rate Study (the Plan). The Plan is intended to aid the Village with prioritizing and replacing water mains and provide a financial and rate roadmap to equitably recover projected costs. The Plan also provides an annual estimated construction cost for budgeting purposes concurrent to the rate study. The objectives of the Plan are to:

- Indicate priority, quantity, cost, and location of annual water main replacement segments.
- Create a plan that can be evaluated on an annual basis by updating water distribution system operations and maintenance history.
- Become a guide for decisions for annual replacement of existing water distribution or transmission mains.
- Develop a financial plan that provides adequate funding to meeting operating and capital requirements of the Water Utility.
- Propose rate structures and design rates that meet the Water Utility objectives and equitably recover costs.

To achieve these goals, the Plan was developed following a four-step approach depicted in Figure ES-1. This approach couples the Water Main Replacement Plan with a comprehensive Water Rate Study.

Figure ES-1: Plan Approach



The Plan process is described more fully in the Overview section of this report. It is helpful to note the iterative relationship between the Water Main Replacement Plan (Step 1) and the financial plan (Step 2). The level of water main replacement has a direct bearing on the level of revenue increases proposed in the

financial plan, and as a result several scenarios have been developed. Three scenarios are described further in this report.

This report summarizes the preliminary recommendations regarding the first two steps of the Plan. Burns & McDonnell and Village staff wish to present the preliminary recommendations to the Village Council regarding the Water Main Replacement Plan and the financial plan prior to full completion of the report. Feedback and direction from the Village Council may lead to modifications to either the Water Main Replacement Plan or the financial plan. After consideration of Board feedback regarding the Water Main Replacement Plan and the financial plan, a full report including recommendations regarding all facets of the Plan will be provided for the Village's review, to be followed by an additional presentation to the Village Council.

Water Main Replacement Plan

The Village's water distribution system contains approximately 71.5 miles of water main. The majority of the water main is aged and undersized:

- 14 percent of the system is 4-inch diameter water main
- 53 percent is 6-inch diameter water main.
- More than 58 percent of the water mains are over 100 years old.
- Based on a weighted average of breaks and pipes within the system, 4-inch diameter pipes account for approximately 43 percent of the breaks, and 6-inch diameter pipes account for approximately 33 percent of the breaks.

The Water Main Replacement Plan represents Step 1 of the Study, as depicted previously in Figure ES-1.

The goals of the Water Main Replacement Plan were to:

- Indicate priority, quantity, cost, and location of annual water replacement segments.
- Evaluate replacements on an annual basis by updating water distribution system operating and maintenance history.
- Become a guide for decisions regarding annual replacement of existing water distribution or transmission mains.

By analyzing various parameters, Burns & McDonnell created a document that prioritizes water main segments. These parameters include: number of breaks, break type, water main age, water main material, water main capacity, type of customers, critical risk priority, water main size, water main purpose, and

system continuity. Multipliers were assigned to the parameters that were deemed as higher priority to the Village.

Water distribution system information and operating data was gathered such as break history and capacity issues, from which 236 water main segments were selected and input into the parameter worksheets document to be evaluated according to selected parameters and weighted averages.

Burns & McDonnell recommends focusing on segments with high break volumes, especially in recent years, as this indicates deterioration. Replacing the 4-inch and 6-inch diameter water mains should also be a priority as these typically do not provide sufficient flow or maintain desired water pressure during high usage, particularly for fire flow. The Water Main Replacement Plan utilizes a parameter spreadsheet document that allows for new information to be entered and the document to be maintained going forward. Burns & McDonnell recommends this be done on an annual basis keeping the information up to date and allowing the Village to reprioritize water segments accordingly.

Based on the parameter analysis for each water main segment and anticipated funding available in Scenario 1, Table ES-1 presents the recommended segments for replacement from 2017 through 2025. The last column to the right reflects anticipated annual funding levels.

Table ES-1: Recommended Water Main Replacement Segments

Segment	Replacement Year	Length (feet)	Estimated Cost	Scenario 1 Funding for Renewal / Replacement
Cherry Street (Birch/Ridge)	2017	1304	\$958,000	\$1,000,000
Spruce Street (Glendale/Locust)	2018	1154	\$847,000	\$1,000,000
Ash Street (Glendale/Birch)	2019	1469	\$1,079,000	\$1,000,000
Hackberry Lane (Hibbard/end)	2020	1397	\$1,026,000	\$1,100,000
Ash Street (Birch/Green Bay)	2021	1679	\$1,233,000	\$1,200,000
Spruce Street (Locust/Green Bay)	2022	1888	\$1,387,000	\$1,300,000
Elm Street (Locust/Provident) & N/S Forest Glen Drive	2023	2121	\$1,558,000	\$1,600,000
Asbury Avenue (Grove/Lake)	2024	2792	\$2,050,000	\$2,000,000
Cherry Street (Maple/Sheridan) & Sunset Road (Poplar/Essex)	2025	3953	\$2,903,000	\$2,900,000

Appendices to this report provide a complete list of water main segments for replacement. It is the intent that on an annual basis, updated operation and maintenance data be reviewed and the segments reprioritized by the Village. Use of the parameter spreadsheet document will facilitate this annual update process. This allows the annual replacement program to meet current operational and budgetary requirements.

Financial Planning

Financial planning represents Step 2 of the Plan. Several financial planning scenarios were evaluated to examine the operating and capital funding needs of the system. A summary of key financial terms regarding three representative financial planning scenarios is shown in Table ES-2. Under each of the three alternatives, revenues under existing water rates are not adequate to meet the projected cash obligations of the utility over the ten-year study period.

Scenario 1 is recommended based on its ability to meet the following guiding principles:

1. Minimize the need for sudden and substantial revenue adjustments.
2. Maintain projected operating reserves each year in an amount equal to a minimum of 33 percent of total revenue requirements, which includes operation and maintenance expenses, payment in lieu of taxes, and where applicable, debt service payments.
3. Mitigate new debt issuance where possible.
4. Fully implement the targeted renewal/replacement program by 2025, phasing in the program in accordance with available funding.

Table ES-2: Summary of Key Financial Assumptions by Scenario

Indicator	Scenario 1	Scenario 2	Scenario 3
	General Fund Loan	No Debt	Revenue Bond Debt
Total Baseline CIP	\$ 4,904,000	\$ 4,904,000	\$ 4,904,000
Renewal & Replacement CIP 2016-2020	\$ 4,100,000	\$ 2,650,600	\$ 9,622,400
Renewal & Replacement CIP 2021-2025	\$ 9,000,000	\$ 9,738,600	\$ 13,744,000
Total Renewal/Replacement	\$ 13,100,000	\$ 12,389,200	\$ 23,366,400
2017 Renewal & Replacement Spend	\$ 1,000,000	\$ 450,000	\$ 2,300,000
2025 Renewal & Replacement Spend	\$ 2,900,000	\$ 2,951,100	\$ 2,913,700
Number of Debt Issues	3	0	5
Total Debt Issued	\$ 3,000,000	\$ -	\$ 24,400,000
Revenue Adjustment Proposed			
FY 2017 (Effective Jan 1 each year)	8.50%	20.00%	8.00%
FY 2018	8.50%	7.50%	8.00%
FY 2019	8.50%	7.50%	8.00%
FY 2020	8.50%	7.50%	8.00%
FY 2021	8.50%	7.50%	8.00%
FY 2022	8.50%	7.50%	8.00%
FY 2023	8.50%	7.50%	8.00%
FY 2024	8.50%	7.50%	8.00%
FY 2025	8.50%	7.50%	8.00%
Cumulative Increase	108.39%	114.02%	99.90%

Scenario 1 recommends 8.5 percent annual revenue increases for 2016 through 2025, at which point renewal and replacement funding is projected to be sufficient to implement the renewal replacement program at a 100-year replacement rate. Scenario 1 also includes a loan from the Village General Fund in three \$1 million disbursements to provide an initial jump start in funding for renewal and replacement projects.

Cost of Service & Proposed Rates

Cost of service analysis and recommendations regarding proposed rates are dependent on the preliminary recommendations regarding water main replacement and financial planning, including proposed revenue increases. After consideration of feedback received regarding the Water Main Replacement Plan and the financial plan, a full report including recommendations regarding all facets of the Plan will be provided for the Village's review, to be followed by an additional presentation to the Village Council.

1.0 OVERVIEW

1.1 The Village's Water Distribution System Overview

The Village's water distribution system contains approximately 71.5 miles of water main. The majority of the water main is aged and undersized:

- 14 percent of the system is 4-inch diameter water main
- 53 percent is 6-inch diameter water main.
- More than 58 percent of the water mains are over 100 years old.
- Based on a weighted average of breaks and pipes within the system, 4-inch diameter pipes account for approximately 43 percent of the breaks, and 6-inch diameter pipes account for approximately 33 percent of the breaks.

The water distribution system has performed well to date, averaging approximately 0.2 breaks per year per mile, while nearby suburbs average approximately 0.4 and 0.7 breaks per year per mile. Various hydrants within the Village have insufficient fire flow volumes of 500 gpm or less. This fire flow deficiency is primarily caused by hydrants connected to 4-inch diameter mains or located along lengthy dead end water main segments. In addition to main break frequency, the Water Main Replacement Plan design incorporated the prioritizing of the old and undersized water main segments for replacement, number of services on a segment basis, and various risk factors.

1.2 Project Approach

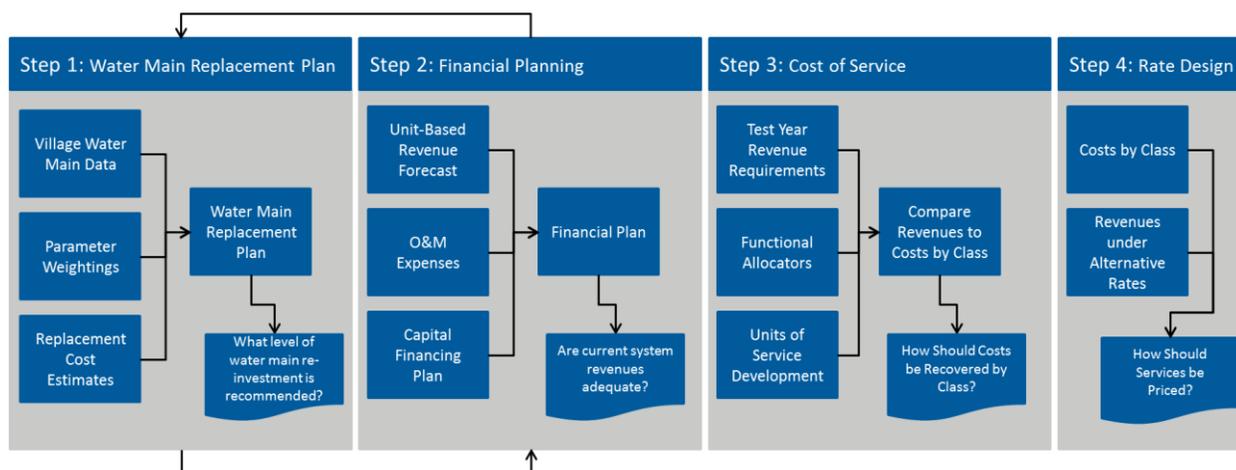
Burns & McDonnell was contracted by the Village to create a plan that assists the Village in prioritizing and replacing water mains and provides a financial and rate roadmap to equitably recover projected costs. The Water Main Replacement Plan also provides an annual estimated construction cost for budgeting purposes and as input to the concurrent rate study. The objectives of the Water Main Replacement Plan are to:

- Indicate priority, quantity, cost, and location of annual water replacement segments.
- Be created in a manner that can be evaluated on an annual basis by updating water distribution system operations and maintenance history.
- Become a guide for decisions for annual replacement of existing water distribution or transmission mains.

- Develop a financial plan that provides adequate funding to meeting operating and capital requirements of the water utility.
- Propose rate structures and design rates that meet the water utility objectives and equitably recover costs.

To achieve these goals, the Plan was developed following a four-step approach depicted in Figure 1-1. This approach couples the Water Main Replacement Plan with a comprehensive Water Rate Study.

Figure 1-1: Plan Approach



Step 1: Water Main Replacement Plan provides an assessment of rehabilitation and replacement spending necessary to maintain desired levels of service and integrity within the water system. Additionally, the plan ranks and prioritizes water main segments for replacement. Section 2.0 of this report provides details regarding the Water Main Replacement Plan.

Step 2: Financial planning provides an indication of the adequacy of the revenue generated by current rates. The results of the financial forecast analysis answer the questions "Are the existing rates adequate?" and "If not, what level of overall revenue increase is needed?" The financial planning analysis is presented in Section 3.0 of this report.

Step 3: Cost of service focuses on assigning cost responsibility to customer classes. Each customer class is allocated an appropriate share of the overall system costs based on the level of service provided. The net revenue requirements (costs to be recovered from rates) identified in Step 2 are allocated to customers in accordance with industry standards and principles and system specifics. The cost of service analysis is

detailed in Section 4.0 of this report. (Details will be added in this section after consideration of feedback regarding the Water Main Replacement Plan and the financial plan.)

Step 4: Rate design provides for the required revenue recovery. Once the overall level of revenue that is required is identified and customer class responsibility for that level of revenue is determined, rate schedules for each rate class are developed that will generate revenues accordingly. The rate design analysis is detailed in Section 5.0 of this report. (Details will be added in this section after consideration of feedback regarding the Water Main Replacement Plan and the financial plan.)

1.3 Water Main Infrastructure Reinvestment – A National Challenge

The challenge of addressing aging water infrastructure is not unique to the Village. It is estimated that more than one million miles of water mains are in place in the United States. In comparison, there are over four million miles of roadway in the United States. The condition of these water mains are mostly unknown as they are buried and out of sight. Some pipes date back to the Civil War era and are often not examined until there is a problem or a water main break. Water main break frequency is increasing as there are an estimated 240,000 water main breaks per year in the United States. Failures in drinking water infrastructure can result in water disruptions, impediments to emergency response and damage to other types of infrastructure. The replacement era is upon us.

The Environmental Protection Agency (EPA) estimates that approximately 4,000 to 5,000 miles of water mains are replaced annually, with an anticipated increase in replacement activity in coming years. The annual replacement rate is projected to peak around 2035 at 16,000 to 20,000 miles of aging water main replaced each year. Meanwhile, water mains installed during the middle of the 20th century are likely to begin to fail in large numbers. Thus, the ability to determine pipe condition will allow worst-condition pipes to be addressed first to avoid potential failures and mitigate associated risks, damages and costs. It will also help avoid premature replacement of structurally sound pipes to save resources and time.

In 2001, an American Water Works Association (AWWA) study called “Dawn of Replacement” pointed out:

“The oldest cast iron pipes—dating to the late 1800s—have an average useful life of about 120 years. This means that, as a group, these pipes will last anywhere from 90 to 150 years before they need to be replaced, but on average they need to be replaced after they have been in the ground about 120 years. Because manufacturing techniques and materials changed, the roaring '20s vintage of cast-iron pipes has an average life of about 100 years. And because techniques and materials continued to evolve, pipes laid down in the Post-World War II boom

have an average life of 75 years, more or less. Using these average life estimates and counting the years since the original installations shows that these water utilities will face significant needs for pipe replacement over the next few decades. Replacement of pipes installed from the late 1800s to the 1950s is now hard upon us, and replacement of pipes installed in the latter half of the 20th Century will dominate the remainder of the 21st. We believe that we stand today at the dawn of a new era—the replacement era—for water utilities.”¹

Table 1-1 displays the time periods in which various water pipe materials were predominantly used.

Table 1-1: Historic Production and Use of Water Pipe by Material ²

Pipe Material	Joint Type	Internal Corrosion Protection	External - Corrosion Protection	1900s	1910s	1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s
Steel	Welded	None	None	Commercially Available				Predominantly in Use						
Steel	Welded	Cement	None					Predominantly in Use						
Cast Iron (Pit Cast)	Lead	None	None	Predominantly in Use										
Cast Iron	Lead	None	None			Predominantly in Use								
Cast Iron	Lead	Cement	None			Commercially Available		Predominantly in Use						
Cast Iron	Leadite	None	None			Commercially Available								
Cast Iron	Leadite	Cement	None			Commercially Available		Predominantly in Use						
Cast Iron	Rubber	Cement	None						Commercially Available		Predominantly in Use			
Ductile Iron	Rubber	Cement	None							Predominantly in Use				
Ductile Iron	Rubber	Cement	PE Encasement							Commercially Available		Predominantly in Use		
Asbestos Cement	Rubber	Material	Material				Commercially Available		Predominantly in Use					
Reinforced Conc.	Rubber	Material	Material	Commercially Available				Predominantly in Use						
Prestressed Conc.	Rubber	Material	Material				Commercially Available		Predominantly in Use					
Polyvinyl Chloride (PVC)	Rubber	Material	Material					Commercially Available		Predominantly in Use				

Commercially Available 
 Predominantly in Use 
 Source: American Water

In an update to the “Dawn of Replacement”, AWWA published “Buried No Longer” which states, “More than a million miles of pipes are nearing the end of its useful life and approaching the age at which it needs to be replaced.”² These replacement costs combined with projected expansion costs will cost more

¹ *Dawn of the Replacement Era: Reinvesting in Drinking Water Infrastructure: An Analysis of Twenty Utilities' Needs for Repair and Replacement of Drinking Water Infrastructure*. Denver, CO: American Water Works Association, 2001. Print.

² *Buried No Longer: Confronting America's Water Infrastructure Challenge*. Denver, CO: American Water Works Association, 2012. Print.

than \$1 trillion over the next couple of decades. The water treatment and delivery systems provide health protection, fire protection, economic prosperity, and the high quality of life.

A comprehensive Study on Water Breaks, dated April 2012, completed by Utah State University³ provides several national-level metrics and rules of thumb which utilities can use for benchmarking purposes. Some of which are:

1. Nationwide One Mile of Installed Water Main Serves 264 People

While in urban areas the industry has assumed 325 people are served for one mile of distribution system pipe, this survey suggests a new national metric of 264 people served per one mile of pipe regardless of utility size. Also, 66 percent of all water mains are 8" or less in diameter and the range of 10" to 14" make up another 18 percent of all installed water mains.

The Village currently has approximately 170 people per mile of water main and 76.2 percent are 8-inch or less in diameter and the range from 10 to 14-inch diameter water main makes up another 14.7 percent.

2. Most Utilities Use Several Kinds of Pipe Materials

Based on the study, 80 percent of water utilities across the nation have water systems comprised of 28 percent Cast Iron (CI), 28 percent Ductile Iron (DI), and 23 percent Polyvinyl Chloride (PVC).

The Village installed water mains utilize a combination of cast iron at 88.8 percent and ductile iron at 10.7 percent. The other 0.5 percent is marked as unknown in the GIS.

3. Pipe Material Use Differs by Region

Water main pipe material usage varies significantly over geographic regions. The Northeast and North Central region of the USA uses either CI or DI pipe for approximately 90 percent of its length.

The Village is located within the North Central Region and uses 99.5 percent CI or DI pipe.

4. There is Considerable Scatter in Pipe Failure Rate Data

The water main break experiences of one utility may not represent another. Factors such as climate, installation practices, and the corrosiveness of soil can greatly affect failure rates. The overall failure rate based on the study participants is 11.0 failures/ (100 miles)/year.

³ "Water Main Break Rates in the USA and Canada: A ..." Web. 9 May 2016.

The Village's average failure rate is 22.5 failures/ (100 miles)/year based on provided break data from 1984 through 2015.

5. The Average Age of Failing Water Mains is 47 years old

About 43 percent of water mains are between 20 and 50 years old and 22 percent of all mains are over 50 years old. While pipe life can be estimated at over 100 years, actual life is affected by the climate, corrosiveness of soil, and installation practices. Based on the detailed survey, the average expected life of pipe being put in the ground today is 79 years. Regardless of the pipe material selected, installation practices will affect the actual life that can be achieved.

Approximately 7 percent of the Village's water mains are between 20 and 50 years old, and 88 percent of the Village's water mains are over 50 years old. The average expected life of the Village's pipe is 87 years.

6. The Average Supply Pressure is 77 psi with Pressure Fluctuations less than 20 psi.

Pressure events can contribute to water main breaks for pipes that have internal corrosion (tuberculation) or weakened areas due to external corrosion. Pressure is an important component to pipe design and material selection. A well-controlled system operated below design limits will lead to extended pipe life.

The Village's system operates below the study's average 77 psi at approximately 50 psi.

7. Nationally Over 8 percent of Installed Water Mains are Beyond Their Useful Life

This percentage corresponds with an EPA study (EPA, 2002) that shows the amount of pipe needing immediate replacement is growing rapidly. Improved asset management will be essential to all utilities to survive this trend.

Assuming an average water main useful life of 100 years, over 58 percent of the Village's water mains are currently beyond their useful life.

AWWA's recent update, "Buried No Longer", presented average estimated service life and replacement values for different size water utilities and locations. Table 1-2 shows the magnitude of the national costs for replacing water systems. The Village is a part of the Midwest Medium and Small Region's cost which totals \$305,925 million.

Table 1-2: Aggregate Replacement Value of Water Pipes by Pipe Material and Utility Size (millions 2010 \$s)²

Region	CI	CICL	DI	AC	PV	Steel	PCCP	TOTAL
Northeast Large	48,958	8,995	5,050	2,308	1,875	335	0	67,522
Northeast Medium & Small	66,357	61,755	28,777	26,007	16,084	5,533	6,899	211,411
Northeast Very Small	14,491	15,992	10,661	7,281	7,937	329	462	57,152
Midwest Large	37,413	9,151	3,077	2,504	1,098	784	512	54,539
Midwest Medium & Small	74,654	92,106	51,577	37,248	30,506	8,682	11,152	305,925
Midwest Very Small	37,597	28,943	25,464	12,428	19,720	601	828	125,581
Southeast Large	30,425	28,980	29,569	21,229	14,936	9,337	7,227	141,703
South Medium & Small	54,772	98,608	140,079	103,659	102,804	21,394	17,160	538,475
South Very Small	43,183	24,998	49,791	34,529	47,823	1,461	1,244	203,028
West Large	15,448	16,055	28,949	14,774	14,723	7,443	6,215	103,607
West Medium & Small	15,775	50,145	70,355	50,541	48,885	12,276	9,806	257,782
West Very Small	16,344	11,199	17,910	13,166	17,245	545	453	76,862
Total	455,416	446,927	461,258	325,674	323,637	68,719	61,957	2,143,589

CI: cast iron; CICL: cast iron cement lined; DI: ductile iron; AC: asbestos cement; PV: polyvinyl chloride; PCCP: prestressed concrete cylinder pipe

Table 1-3 shows the national average estimated service life for pipe materials. The average water main life expectancy for a water utility categorized as Midwest Medium and Small is 87 years. The average age of the Village's water mains is approximately 87 years.

Table 1-3: Average Estimated Service Lives by Pipe Materials (average years of service)²

Derived Current Service Lives (Years)	CI	CICL (LSL)	CICL (SSL)	DI (LSL)	DI (SSL)	AC (LSL)	AC (SSL)	PVC	Steel	Conc & PCCP
Northeast Large	130	120	100	110	50	80	80	100	100	100
Midwest Large	125	120	85	110	50	100	85	55	80	105
South Large	110	100	100	105	55	100	80	55	70	105
West Large	115	100	75	110	60	105	75	70	95	75
Northeast Medium & Small	115	120	100	110	55	100	85	100	100	100
Midwest Medium & Small	125	120	85	110	50	70	70	55	80	105
South Medium & Small	105	100	100	105	55	100	80	55	70	105
West Medium & Small	105	100	75	110	60	105	75	70	95	75
Northeast Very Small	115	120	100	120	60	100	85	100	100	100
Midwest Very Small	135	120	85	110	60	80	75	55	80	105
South Very Small	130	110	100	105	55	100	80	55	70	105
West Very Small	130	100	75	110	60	105	65	70	95	75

*LSL indicates a relatively long service life for the material resulting from some combination of benign ground conditions and evolved laying practices etc.
SSL indicates a relatively short service life for the material resulting from some combination of harsh ground conditions and early laying practices, etc.*

Table 1-4 shows the estimated aggregate needs for investment in water mains through 2035 and 2050 by Region of the United States (AWWA, 2012).

Table 1-4: Aggregate Needs for Investment in Water Mains through 2035 and 2050, by Region ²

2011-2035 Totals				2011-2050 Totals			
(2010 \$M)	Replacement	Growth	Total	(2010 \$M)	Replacement	Growth	Total
Northeast	\$92,218	\$16,525	\$108,744	Northeast	\$155,101	\$23,200	\$178,301
Midwest	\$146,997	\$25,222	\$172,219	Midwest	\$242,487	\$36,755	\$279,242
South	\$204,357	\$302,782	\$507,139	South	\$394,219	\$492,493	\$886,712
West	\$82,866	\$153,756	\$236,622	West	\$159,476	\$249,794	\$409,270
Total	\$526,438	\$498,285	\$1,024,724	Total	\$951,283	\$802,242	\$1,753,525

As can be seen by the information provided above, the need for water main replacement is large. To meet these funding needs, the typical household bill for potable water will likely increase. As replacement is an ongoing requirement, these capital outlays are unlike those required to build a new treatment plant, pump station or storage tank, where the capital costs are incurred up front and aren't faced again for many years. Rather, infrastructure renewal investments are likely to be incurred each year over several decades. For that reason, many utilities may choose to finance water main renewal and replacement on a "pay-as-you-go" basis rather than through debt financing.

As large as the cost of reinvestment may be, not undertaking it will be worse in the long run. This suggests a responsibility for utility managers to develop the processes necessary to continually improve their understanding of the replacement dynamics of their water system.

The United States is reaching a crossroads and faces a difficult choice. We can incur the haphazard and growing costs of living with aging and failing drinking water infrastructure. Or, we can carefully prioritize and undertake drinking water infrastructure renewal investments so that our water utilities can continue to reliably and cost-effectively support the public health, safety, and economic vitality of our communities. The Village does not appear to be an exception to these findings based on the age, size and

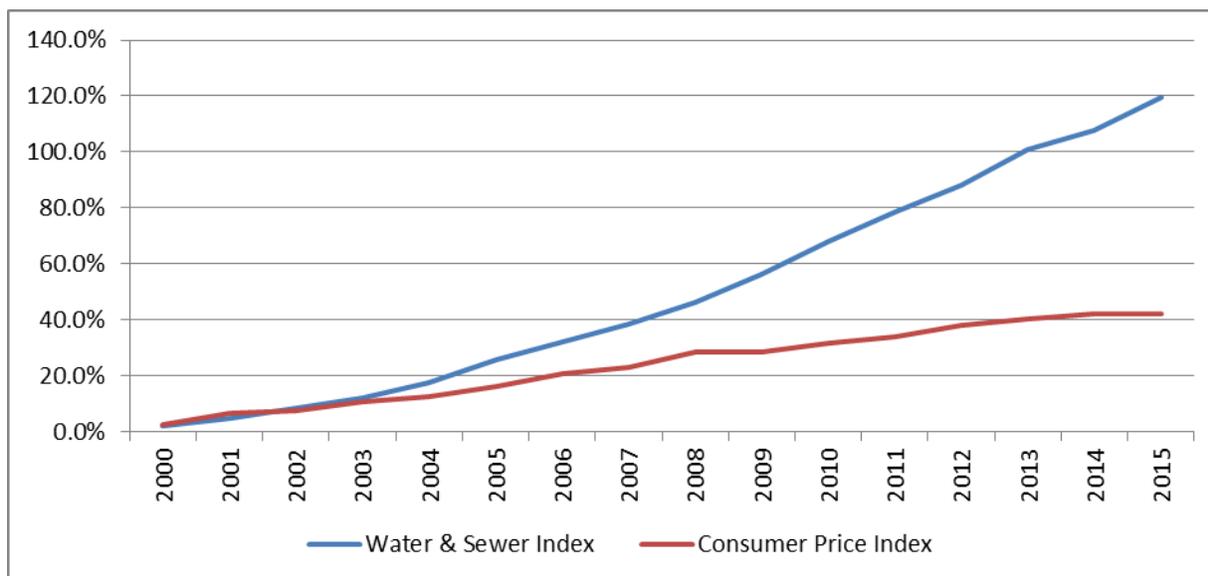
break history of the Village's water system. Therefore, completing a water main replacement plan is a prudent approach to prioritizing the renewal program.

1.4 Water Utility Rates are Increasing Much Faster than Inflation

Replacement of aging infrastructure is one of several dynamics impacting water utility rates. Other dynamics may include regulatory requirements, inflation on operating and capital costs, and a general trend in declining consumption most often associated with more efficient fixtures and appliances and greater awareness of water conservation.

Each utility is different, and the relative importance of these dynamics will vary by utility. However, there is no doubt that water rate increases have substantially outpaced general inflation in the United States. The United States Bureau of Labor Statistics (BLS) tracks many facets of inflation. The most commonly referenced measure is the consumer price index (CPI-U) which measures inflation at the consumer level. The BLS also tracks a combined inflation index for consumer water and sewer costs. Figure 1-2 compares changes in the consumer price index to changes in the water and sewer cost index.

Figure 1-2: Historical Changes in the Consumer Price Index and Water and Sewer Cost Index



Cumulatively since 2000, the water and sewer index has risen about 120 percent, while CPI has increased about 42 percent. Annually, this equates to an approximate increase of 5 percent per year for the water and sewer index, while CPI's annual rate of change is about 2 percent per year. However, in the last five years, the gap appears to be widening. During that time, the water and sewer index has increased at approximately 5.5 percent annually, while CPI has trended upward at approximately 1.5 percent annually.

A utility may be influenced by specific circumstances that can lead to increases that are higher or lower than these industry trends. However, costs associated with renewal and replacement of existing infrastructure and the increasing cost of regulatory compliance are two of the primary dynamics contributing toward the increases in water and sewer rates. Understanding the nature of increasing utility costs within the water industry provides meaningful context in evaluating proposed financial plans.

2.0 WATER MAIN REPLACEMENT PLAN DETAILS

The goal of the Water Main Replacement Plan was to develop an annual water main replacement program that meets annual budget constraints, provides measurable results, and is adaptable to system changes.

This section presents the available water system information utilized in developing the Water Main Replacement Plan, parameters used for prioritizing replacement segments, summarizes the results of the Water Main Replacement Plan, and provides water main replacement cost estimates.

2.1 Review of Available Information

Relevant water system information was collected to develop the Water Main Replacement Plan. This information included a GIS file containing water distribution system layout, pipe diameter, pipe material, valve layout, and installation year. Pipe break data from 1984 through 2015 was provided. The water main failure data included the date of the break, description of the break type, and what water main segment the break occurred on.

Daily water system activities that typically impact water main life expectancy are:

- **Pumping operations:** This pertains more to frequency of pump cycling which may cause significant fluctuations in system pressure or transient pressures.
- **Transient Pressures:** Transient pressures are created by pump on/off cycling or quick decrease or increase in flow demand such as opening or closing a hydrant quickly. Transient pressures are a common cause of water main failure.
- **Freeze/Thaw Cycle:** Ground frost that occurs during the change of seasons can negatively impact water mains.
- **Water Main Age:** From a historical standpoint the era the water main was manufactured can have a significant impact on break frequency probability. Table 1-1 provides an overall industry historical pipe material usage and Table 1-3 provides an overall water industry service life based on pipe material. Pipe manufactured in the 1920's and 1930's, commonly referred to as sand cast water main, has shown good durability. The down side is that this pipe typically had lead joints and variable pipe wall thickness. During times of war, the quality of the cast iron material was impacted by the military's needs and had a tendency to be lower grade iron and subject to higher break frequency. Applicable time periods for cast iron pipe in this system include World War II

(1939-1945) and the Korean War (1950-1953). Communities with similar era water main have typically replaced these mains before older mains.

2.2 Ranking Parameters

A parameter spreadsheet document was created for the purpose of organizing and ranking water main segments according to the identified parameters. The parameters and evaluation methods applied in the document are detailed below.

A total of eleven (11) parameters were considered for the Water Main Replacement Plan; based on available information. The parameters were assigned different priority values based on input from the Village. The priority values correlated with a multiplier which was used to determine a water main segments overall replacement score, giving the more important parameters more impact on the priority of replacing a water main segment. The parameters that were considered in order of importance were:

- **Breaks:** The number of breaks are divided into three categories:
 - number of breaks in the last five years,
 - number of breaks in the last five to ten years,
 - number of breaks that occurred prior to ten years ago.

If the water main segment length being considered is greater than 1000 feet, the breaks are totaled per thousand feet of pipe by dividing the number of breaks by the length of pipe divided by 1000, and the resultant number is added to the total parameter value.

If the segment length is less than or equal to 1000 feet, the number of breaks is added to the total parameter value. The type of break was considered if that information was available. The intent is to determine the potential for future breakage, replacing the water main before breakage becomes excessive.

- **Water Main Age:** Water main age denotes years in service. The value in the worksheet column is the total number of years in service divided by 10. Based on engineering judgment gained through experience gained through conducting these assessment for a number of water systems, an adjustment factor of 10 was selected to allow for a more even distribution of impact on prioritization of water main segments. The age of the pipe was determined by available data or installation date in the Village GIS file.

- **Water Main Material:** Water main material is the installed pipe material for the segment. The six categories of pipe material in ascending order of impact are: ductile iron (DI), polyvinyl chloride (PVC), high-density polyethylene (HDPE), sand cast iron (SCI), cast iron (CI), and other. The material dictates the numerical value to be placed in the worksheet column.
- **Number of Customers:** Number of customers is represented by the number of active service laterals that are connected to a segment of water main. The worksheet value is the number of laterals connected to the water main segment divided by 5. Based on engineering judgment gained through previous experience, the adjustment factor of 5 was selected to allow for a more even distribution of impact on prioritization of water main segments.
- **Water Main Capacity:** Water main capacity refers to the hydraulic capacity of the existing water main compared to system or location requirements. A greater deficiency is assigned a higher number. Water main capacity requirements typically change over time caused by higher per capita use or change in customer type.
- **Customers Type:** Pertains to customer type and the risk of that customer being without appropriate water quality and quantity. The customer types in ascending order of importance are: single family residential, multi-family residential, commercial, and institutional.
- **Critical Risk Priority:** Critical risk priority relates to level of risk to adjacent infrastructure (above and below grade) if water main breaks occur. For example, if a large diameter water main breaks, the risk could be considerable based on volume and pressure of water discharge through the break versus a smaller diameter pipe.
- **Water Main Size:** Water main size refers to the inside diameter of the existing water main. . Size of pipe will determine the value to be placed in the column for the segment. The value for each segment is the water main inside diameter size divided by 2. Segments with 4-inch or 6-inch diameter water main were given scores of 8 and 6 respectively to increase their impact on the total parameter value.
- **Water Main Purpose:** Purpose designates the water main as a distribution or a transmission water main, with a transmission main having a higher value.

- **System Continuity:** System continuity pertains to the ability of the water mains to be continuous; minimizing dead ends. If the existing segments hinder system continuity, the value is higher.
- **Type of Break:** Type of break refers to what kind of break has occurred on the water main. This can be an indication of what caused the break and if that issue could arise again. The six types of breaks in ascending order of importance are: service, valve, joint, horizontal, vertical, and hole. The most frequent type of break on a segment was the value that was entered on the sheet.

Table 2-1 shows the parameters that were used and their corresponding multipliers.

Table 2-1: Parameters and Multipliers

Parameter	Multiplier
No. of Breaks (last 5 years)	1.4
No. of Breaks (last 10 years)	1.4
No. of Breaks (> 10 years or unknown)	1.4
System Continuity	1.4
Purpose	1.4
Risk - Critical	1.3
Water Main Size	1.3
Age	1.3
Pipe Material	1.3
Number of Customers	1.3
Capacity	1.2
Risk - Customer	1.2
Type of Break	1.0

Additional parameters that may be considered in the future are environmental conditions, soils corrosiveness, and depth of bury. These parameters were not considered in the Water Main Replacement Plan.

2.3 Results

Exhibit 1 shows values that were entered into the document. Each water main segment has a separate value for each parameter. This data was determined from available information and was entered without any adjustment factors or multipliers.

The first table in Exhibit 2 shows the segment summaries. The values for each parameter are the values from Exhibit 1 with adjustment factors and multipliers applied. A segment's total parameter value is the sum of parameters for each segment. Higher parameter values represent a higher priority. The second table in Exhibit 2 shows the total parameter value of each of the 236 water main segments evaluated in descending order.

Near the top of the list of segments is Oak Street between Locust and Birch. This segment of water main is set to be abandoned in 2016. Another segment further down on the list, the 4-inch on Hill Road between Ridge and Church, is also set to be abandoned in 2016. These sections of water main remained on the list and were noted as abandoned or to be abandoned, but were not included in the cost estimate.

2.4 Cost Estimate

A cost estimate was developed for replacing water mains. The unit costs were determined based on recent Burns & McDonnell bid tabulations and 2015/2016 cost data. Unit costs used for the cost estimate are shown in Table 2-2. A restoration value was added to account for vegetative refurbishment. A 30 percent contingency was added to the totals, which is industry standard for projects at a conceptual phase. A 20 percent contingency was added for engineering and administration; 15 percent for engineering fees, and five percent for any additional Village costs, outside of engineering, related to the project. Costs are according to current cost indices, and annual adjustment factors should be considered when looking at future costs.

Table 2-2: Cost Estimate Unit Prices

Item Name	Unit	Unit Cost
Water Main - 8" Diameter	Foot	\$ 170
Water Main - 10" Diameter	Foot	\$ 195
Water Main - 12" Diameter	Foot	\$ 225
Water Main - 16" Diameter	Foot	\$ 280
Water Main - 20" Diameter	Foot	\$ 380
Water Main Valves in Vaults	Each	\$ 9,100
Water Service Connections	Each	\$ 3,400

Item Name	Unit	Unit Cost
Fire Hydrants and Leads	Each	\$ 6,400
Excavation & Trenching	CY	\$ 11
Trench Backfill	CY	\$ 43
Pavement Removal & Patching	SY	\$ 125
Restoration	SY	\$ 10

Table 2-3 shows a cost estimate for the ten highest ranked segments according to the parameter spreadsheet as shown in Exhibit 2. These segments are either 4-inch or 6-inch diameter pipe; the cost estimates were calculated assuming an 8-inch diameter replacement water main.

Table 2-3: Cost Estimate for Ten Highest Ranked Segments

Segment	Length (feet)	Cost
Foxdale (Tower/Humboldt)	2,560	\$1,880,000
Ash Street (Glendale/Birch)	1,469	\$1,079,000
Cherry Street (Glendale/Birch)	2,511	\$1,844,000
Elm Street (Locust/Provident)	570	\$2,050,000
Asbury Avenue (Grove/Lake)	2,792	\$696,000
Spruce Street (Locust/Green Bay)	1,888	\$1,387,000
Cherry Street (Maple/Sheridan)	2,262	\$1,661,000
Elm Street (Maple/Sheridan)	1,270	\$933,000
Cherry Street (Birch/Ridge)	1,304	\$958,000
Sunset Road (Poplar/Essex)	2,224	\$1,633,000
Total	18,850	\$14,121,000

The annual cost to replace the entire water system over a 100 year period is approximately \$2.96 million. The annual cost to replace only the water mains that were identified in the Water Main Replacement Plan over a 100 year period is approximately \$2.30 million in current dollars. Assuming a three percent inflation factor, the annual cost to replace the water mains identified in the Water Main Replacement Plan will approach \$2.90 million by 2025.

Based on the financial plan and proposed revenues, Table 2-4 shows the recommended water main segments to be replaced from 2017 to 2025. These segments were selected based on priority and location, and meet the financial plan as presented in Financial Plan Scenario 1 alternative.

Table 2-4: Recommended Water Main Replacement Schedule

Segment	Replacement Year	Length (feet)	Estimated Cost	Scenario 1 Funding for Renewal / Replacement
Cherry Street (Birch/Ridge)	2017	1304	\$958,000	\$1,000,000
Spruce Street (Glendale/Locust)	2018	1154	\$847,000	\$1,000,000
Ash Street (Glendale/Birch)	2019	1469	\$1,079,000	\$1,000,000
Hackberry Lane (Hibbard/end)	2020	1397	\$1,026,000	\$1,100,000
Ash Street (Birch/Green Bay)	2021	1679	\$1,233,000	\$1,200,000
Spruce Street (Locust/Green Bay)	2022	1888	\$1,387,000	\$1,300,000
Elm Street (Locust/Provident) & N/S Forest Glen Drive	2023	2121	\$1,558,000	\$1,600,000
Asbury Avenue (Grove/Lake)	2024	2792	\$2,050,000	\$2,000,000
Cherry Street (Maple/Sheridan) & Sunset Road (Poplar/Essex)	2025	3953	\$2,903,000	\$2,900,000

3.0 FINANCIAL PLANNING ANALYSIS

3.1 Introduction to Financial Planning

The primary issue addressed in the Financial Planning Analysis is revenue adequacy. The results of the Financial Planning Analysis answer the questions:

- "Are the existing rates adequate?"
- "If not, what level of overall revenue increase is needed?"

To determine if the existing schedule of rates can be expected to generate revenues sufficient to meet the Village's operating and capital costs, Burns & McDonnell prepared a ten-year financial projection of revenues and expenditures for the Water Utility. A comparison of projected revenues and expenditures provides insight into the adequacy of overall revenue levels.

Our approach to financial planning involves the following basic steps:

1. Project revenues under existing rates.
2. Project Water Utility expenditures.
3. Develop ten-year financial plan, including the budget year and a nine-year forecast period.

The planning period includes the current fiscal year (FY) 2016 as a budget year and a nine-year forecast period, FY 2017 – FY 2025. Since 2013, the Village has utilized a fiscal year ending December 31. In prior years, the fiscal year ended March 31. Unless otherwise noted, the projected periods in the financial plan recognize the fiscal year ended December 31, consistent with current Village practice.

3.2 Water Utility Revenues under Existing Rates

The first step in the Financial Plan Analysis was to project revenues under the existing schedule of rates. To complete this effort required an analysis of customers, volumes, and revenues.

3.2.1 Historical Projected Customers

Table 3-1 presents the historical water customers served by the Village from 2012 to 2015 and the projection of customers for the 2016 to 2025 planning period. In recent years, the Village has experienced minimal change in the number of accounts. In light of recent trends in account growth, the projection of accounts conservatively assumes no growth within any customer class of accounts for 2016 through 2025.

3.2.2 Historical and Projected Volumes

Table 3-1 also summarizes historical water sales volumes, based on applicable water sales for 2012 to 2015, and the projection of volumes for the 2016 to 2025 planning period. The Village experienced unusually wet weather in 2014 and 2015 which tends to suppress water use in the peak summer months. To develop a demand forecast more consistent with “normal” weather conditions, a five-year average of water use per account was used to estimate 2016 billed water demand. Village use per account was estimated to decline 0.5 percent annually beginning in 2017, with other classes estimated to remain at the five-year average level. Forecasting use per account to decline provides a slightly more conservative forecast of water sales and ultimately, revenue under existing rates. It also recognizes a general trend in declining use per account due to greater adoption of more efficient appliances and low flow fixtures. The projection of stable accounts and the five-year average usage per account indicates water sales estimates of 1,340,500 hundred cubic feet (Ccf) in 2016. By 2025, water sales are projected to decrease to 1,309,200 Ccf due to anticipated declines in use per account.

Table 3-1: Historical and Projected Accounts and Volume

Line No.		Historical					Budgeted	Projected								
		FYE 3/31/12	FYE 3/31/13	FYE 12/31/13	FYE 12/31/14	FYE 12/31/15	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Accounts																
1	Winnetka	4,085	4,081	4,081	4,093	4,098	4,098	4,098	4,098	4,098	4,098	4,098	4,098	4,098	4,098	4,098
2	Northfield	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3	Indian Hill	245	243	243	243	243	243	243	243	243	243	243	243	243	243	243
4	Special (Plant)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5	Total Accounts	4,336	4,330	4,330	4,342	4,347	4,347	4,347	4,347	4,347	4,347	4,347	4,347	4,347	4,347	4,347
Billed Volume (100 Cu. Ft.)																
6	Winnetka	786,821	963,590	696,397	695,794	698,816	801,600	797,600	793,600	789,700	785,700	781,800	777,900	774,000	770,100	766,300
7	Northfield	449,345	488,632	361,805	407,357	393,754	444,000	444,000	444,000	444,000	444,000	444,000	444,000	444,000	444,000	444,000
8	Indian Hill	76,297	101,045	76,841	73,987	73,955	82,100	82,100	82,100	82,100	82,100	82,100	82,100	82,100	82,100	82,100
9	Special (Plant)	19,918	15,166	6,405	12,587	10,999	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800
10	Total Billed Volume	1,332,381	1,568,433	1,141,448	1,189,725	1,177,524	1,344,500	1,340,500	1,336,500	1,332,600	1,328,600	1,324,700	1,320,800	1,316,900	1,313,000	1,309,200

3.2.3 Existing Water Rates

The current water rate schedule is shown in Table 3-2 and features a volumetric usage rate that varies by customer class. Current water rates do not include a base or fixed fee under the current structure.

Table 3-2: Existing Water Rates

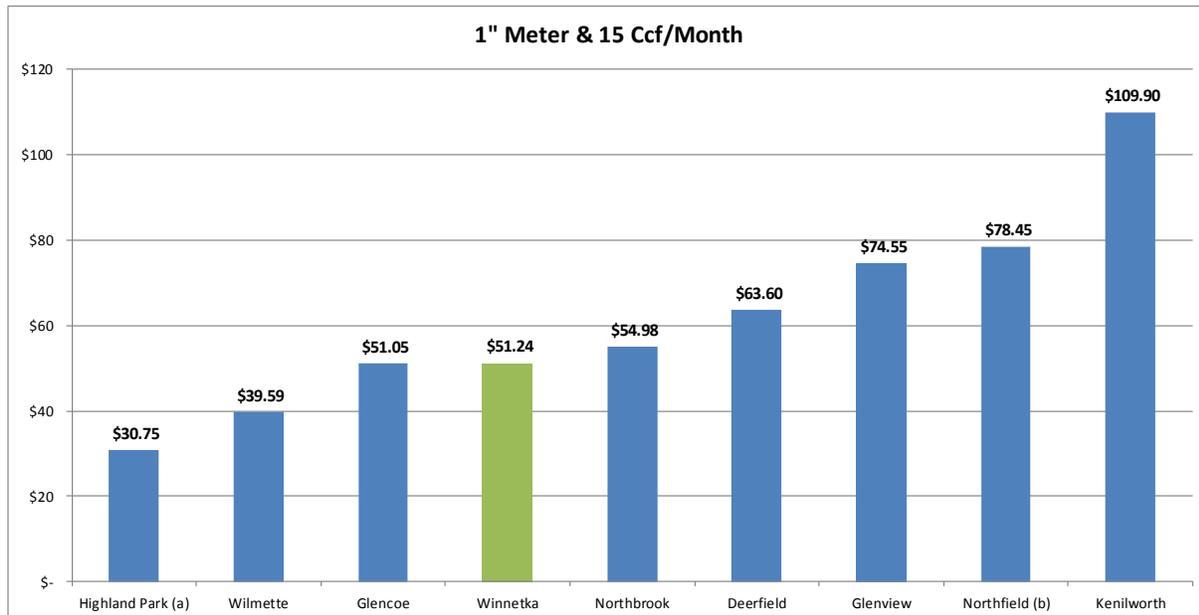
<u>Component</u>	<u>Existing Rates</u>
Volume Charge per 1,000 cubic feet	
Winnetka	\$ 34.16
Northfield	\$ 12.95
Indian Hill	\$ 61.08
Special (Plant)	\$ 25.61

As a matter of practice, rates for service provided to outside Village customers are set at 1.79 times Village rates.

3.2.4 Regional Typical Bill Comparison

Figure 3-1 compares monthly water bills across neighboring water utilities for a customer with a 1-inch meter using 15 Ccf per month, reflective of a typical residential customer in the Village water system. This analysis indicates that the Village's current water rates result in a bill which compares favorably to most regional water utilities. Understanding the competitiveness of current rates is helpful context when evaluating financial planning scenarios.

Figure 3-1: Regional Comparison of Typical Residential Water Bills



(a) Rates effective until July 2016; conservation rate for residential users is effective at that time. At 15 Ccf, the typical bill will be \$33.34 per month at that time.

(b) Inside Village, water only rate.

3.2.5 User Revenues under Existing Rates

Table 3-3 summarizes historical user charge revenues for 2012 to 2015 and a projection of user charge revenues under existing rates for the 2016 to 2025 planning period. The projection of user revenues was estimated based on the forecasted accounts and volumes factored by the existing schedule of water rates.

Historical water user revenues ranged from \$3.1 million to \$4.0 million since 2012. Forecasted user charge revenues reflect the anticipated stable levels of customers and slightly declining volumes previously discussed, and the existing water rates. Overall, water user revenues under existing rates are projected to decline from \$3.86 million in 2016 to \$3.74 million in 2025.

Table 3-3: Historical and Projected Water User Revenues

Line No.	Historical					Budgeted	Projected									
	FYE 3/31/12	FYE 3/31/13	FYE 12/31/13	FYE 12/31/14	FYE 12/31/15	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
User Charge Revenues under Existing Rates																
1	Winnetka	\$ 2,178,010	\$ 2,885,674	\$ 2,210,432	\$ 2,295,355	\$ 2,346,139	\$ 2,738,300	\$ 2,724,600	\$ 2,710,900	\$ 2,697,600	\$ 2,684,000	\$ 2,670,600	\$ 2,657,300	\$ 2,644,000	\$ 2,630,700	\$ 2,617,700
2	Northfield	\$ 538,321	\$ 597,281	\$ 449,660	\$ 508,560	\$ 487,783	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000
3	Indian Hill	\$ 356,852	\$ 520,040	\$ 427,513	\$ 410,784	\$ 443,717	\$ 501,500	\$ 501,500	\$ 501,500	\$ 501,500	\$ 501,500	\$ 501,500	\$ 501,500	\$ 501,500	\$ 501,500	\$ 501,500
4	Special (Plant)	\$ 41,190	\$ 33,862	\$ 15,163	\$ 30,986	\$ 27,618	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000
5	Total User Charge Revenues	\$ 3,114,373	\$ 4,036,857	\$ 3,102,768	\$ 3,245,685	\$ 3,305,257	\$ 3,857,800	\$ 3,844,100	\$ 3,830,400	\$ 3,817,100	\$ 3,803,500	\$ 3,790,100	\$ 3,776,800	\$ 3,763,500	\$ 3,750,200	\$ 3,737,200
6	Retail Revenue	\$ 2,576,052	\$ 3,439,576	\$ 2,653,108	\$ 2,737,125	\$ 2,817,474	\$ 3,282,800	\$ 3,269,100	\$ 3,255,400	\$ 3,242,100	\$ 3,228,500	\$ 3,215,100	\$ 3,201,800	\$ 3,188,500	\$ 3,175,200	\$ 3,162,200
7	Wholesale (Northfield) Revenue	\$ 538,321	\$ 597,281	\$ 449,660	\$ 508,560	\$ 487,783	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000	\$ 575,000
8	Total User Charge Revenues	\$ 3,114,373	\$ 4,036,857	\$ 3,102,768	\$ 3,245,685	\$ 3,305,257	\$ 3,857,800	\$ 3,844,100	\$ 3,830,400	\$ 3,817,100	\$ 3,803,500	\$ 3,790,100	\$ 3,776,800	\$ 3,763,500	\$ 3,750,200	\$ 3,737,200

[1] FYE 12/31/13 is only nine months due to change in fiscal year end.
 [2] 2016 volumes are based on the average annual usage per customer over the previous five years.
 [3] 2016 Revenue calculated by taking 2016 volumes times the 2016 rates.

3.3 Water Utility Expenditures

The Water Utility's primary cash expenditures include the following direct operating and capital costs:

- Operation and Maintenance (O&M) Expenses
- Capital Improvement Program Expenditures

In addition to these costs, the Water Utility also contributes a Payment in Lieu of Taxes to the Village General Fund. Typically this cost is calculated by the Village as 8.0 percent of prior year water revenues.

3.3.1 Operation & Maintenance Expenses

Table 3-4 presents the recent water operation and maintenance expense (O&M) history and the projection of water system O&M expenses through the 2025 planning period. Costs related to capital projects are excluded from Table 3-4 and are addressed in Section 3.3.2 of this report.

In recent history, water O&M expenses ranged from a low of \$2.04 million in 2012 to \$2.91 million in 2015. O&M costs for 2016 are based on the approved budget. In general, projected O&M expenses are anticipated to increase from budgeted 2016 amounts at about 3 percent annually. This overall inflationary increase is a function of the following inflation rate assumptions developed in collaboration with the Village.

- | | |
|---|--|
| • Employee pay: | 2.5 percent annually, except for 2018 ^(a) |
| • Medical/dental insurance: | 7.5 percent annually |
| • IMRF (retirement) expenses: | Equal to 15 percent of forecasted employee pay |
| • All other employee benefits & pensions ^(b) : | 4.5 percent annually |
| • All other operating expenses: | 3.0 percent annually |

^(a) Employee pay in 2018 inflated at 2.75 percent

^(b) Includes deferred compensation, worker's compensation, life insurance, Medicare, and social security

Table 3-4: Historical and Projected Operation and Maintenance Expenses

Line No.	Historical			Budgeted	Projected											
	FYE 12/31/13	FYE 12/31/14	FYE 12/31/15	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025			
Administration																
1	General and Administrative															
2	Salary & Benefits															
3				173,404	156,100	160,000	164,400	168,500	172,700	177,000	181,400	185,900	190,500	195,300		
4				17,843	20,900	22,500	24,200	26,000	28,000	30,100	32,400	34,800	37,400	40,200		
5				38,310	61,600	64,400	67,300	70,300	73,500	76,800	80,300	83,900	87,700	91,600		
6				25,764	22,400	24,000	24,700	25,300	25,900	26,600	27,200	27,900	28,600	29,300		
7				3,167	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200		
8				258,488	263,300	273,300	283,100	292,700	302,800	313,300	324,200	335,500	347,300	359,600		
9	Services & Supplies															
10				959,534	951,400	980,000	1,009,400	1,039,700	1,070,900	1,103,000	1,136,100	1,170,200	1,205,300	1,241,500		
11				20,405	19,700	20,200	20,800	21,400	22,000	22,700	23,400	24,100	24,800	25,500		
12				979,939	971,100	1,000,200	1,030,200	1,061,100	1,092,900	1,125,700	1,159,500	1,194,300	1,230,100	1,267,000		
13				873,202	1,430,317	1,238,427	1,234,400	1,273,500	1,313,300	1,353,800	1,395,700	1,439,000	1,483,700	1,529,800	1,577,400	1,626,600
Operations																
14	Pumping															
15	Salary & Benefits															
16				470,150	532,700	546,000	561,000	575,000	589,400	604,100	619,200	634,700	650,600	666,900		
17				83,037	95,700	102,900	110,600	118,900	127,800	137,400	147,700	158,800	170,700	183,500		
18				355	400	400	400	400	400	400	400	400	400	400		
19				67,380	76,400	81,900	84,200	86,300	88,400	90,600	92,900	95,200	97,600	100,000		
20				34,432	40,300	42,100	44,000	46,000	48,100	50,300	52,600	55,000	57,500	60,100		
21				655,354	745,500	773,300	800,200	826,600	854,100	882,800	912,800	944,100	976,800	1,010,900		
22	Services & Supplies															
23				117,750	98,200	101,100	104,100	107,200	110,400	113,700	117,100	120,600	124,200	127,900		
24				172,631	184,600	190,100	195,800	201,700	207,800	214,000	220,400	227,000	233,800	240,800		
23				290,381	282,800	291,200	299,900	308,900	318,200	327,700	337,500	347,600	358,000	368,700		
25	132,874	702,828	945,735	1,028,300	1,064,500	1,100,100	1,135,500	1,172,300	1,210,500	1,250,300	1,291,700	1,334,800	1,379,600			
26	605,928															
27	Distribution															
28	Salary & Benefits															
29				324,903	296,100	303,500	311,800	319,600	327,600	335,800	344,200	352,800	361,600	370,600		
30				26,303	37,700	40,600	43,600	46,900	50,400	54,200	58,300	62,700	67,400	72,500		
31				127	100	100	100	100	100	100	100	100	100	100		
32				46,013	54,700	45,500	46,800	47,900	49,100	50,400	51,600	52,900	54,200	55,600		
33				22,437	24,300	25,400	26,500	27,700	28,900	30,200	31,600	33,000	34,500	36,100		
34				419,783	412,900	415,100	428,800	442,200	456,100	470,700	485,800	501,500	517,800	534,900		
35	Services & Supplies															
36				300,112	407,800	420,000	432,600	445,600	459,000	472,800	487,000	501,600	516,600	532,100		
37				3,000	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900		
38				303,112	411,800	424,100	436,800	449,900	463,400	477,300	491,600	506,300	521,400	537,000		
39	427,672	448,252	722,895	824,700	839,200	865,600	892,100	919,500	948,000	977,400	1,007,800	1,039,200	1,071,900			
40	1,166,474	1,151,080	1,668,630	1,853,000	1,903,700	1,965,700	2,027,600	2,091,800	2,158,500	2,227,700	2,299,500	2,374,000	2,451,500			
41	2,039,676	2,581,397	2,907,057	3,087,400	3,177,200	3,279,000	3,381,400	3,487,500	3,597,500	3,711,400	3,829,300	3,951,400	4,078,100			

(a) Includes deferred compensation, worker's compensation, and life insurance.

(b) Includes Medicare and social security.

3.3.2 Projected Capital Improvement Expenditures

Table 3-5 shows the projected capital improvement expenditures for the 2016 to 2025 planning period. The Water Utility maintains a five year CIP which plans for projects through 2020. This CIP is the basis for capital projects shown in Table 3-5 and represents projects that are in addition to any further renewal and replacement in water mains identified in Section 2 of this report. An additional \$400,000 in capital projects has been included in Table 3-5 starting in 2022 to recognize that a level of reinvestment will likely be necessary in Water Utility source, treatment, and distribution assets that has yet to be identified. This placeholder is included in Line 28 starting in 2022. Failing to include some level of investment in 2022-2025 would lead to a plan that risks underfunding capital investment in the last 4 years of the study period.

As shown in Table 3-5, the CIP is estimated to total \$4.90 million through 2025 and ranges by year from \$250,000 to \$863,000. Costs for projects related to the renewal and replacement program are included in subsequent sections of this report.

3.3.3 Existing Debt Service Requirements

The Water Utility does not have any existing debt obligations.

Table 3-5: Capital Improvement Program

Line No.	Projected										Total	
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025		
Transportation												
1	50% of #61 Dump Truck (1996)	-	45,000	-	-	-	-	-	-	-	-	45,000
2	50% of Mini Excavator	35,000	-	-	-	-	-	-	-	-	-	35,000
3	67% of Line Truck #57 (1986)	-	-	-	-	-	-	-	-	-	-	-
4	50% of #62 Dump Truck (1997)	-	-	-	45,000	-	-	-	-	-	-	45,000
5	50% of #84 Pick Up Truck/Snow Plow (2003)	-	25,000	-	-	-	-	-	-	-	-	25,000
6	Sub-Total Transportation	\$ 35,000	\$ 70,000	\$ -	\$ 45,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 150,000
Pumping and Equipment												
7	Place Stone on Exposed Intake Pipe	-	108,000	-	119,000	-	-	-	-	-	-	227,000
8	Low Lift Pump #4	-	-	-	-	-	-	-	-	-	-	-
9	Replace Screen House Valves	-	-	-	-	-	-	-	-	-	-	-
10	Sub-Total Pumping and Equipment	\$ -	\$ 108,000	\$ -	\$ 119,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 227,000
Filtration												
11	Replace Pipe Manifold	90,000	-	-	-	-	-	-	-	-	-	90,000
12	Concrete Repairs Clearwell #1	75,000	-	-	-	-	-	-	-	-	-	75,000
13	Concrete Repairs Clearwell #2	75,000	-	-	-	-	-	-	-	-	-	75,000
14	Replace filter media 5-8	-	105,000	210,000	210,000	-	-	-	-	-	-	525,000
15	Replace flocculators	-	-	-	-	460,000	-	-	-	-	-	460,000
16	Sub-Total Filtration	\$ 240,000	\$ 105,000	\$ 210,000	\$ 210,000	\$ 460,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,225,000
Distribution												
17	Install Sectionalizing Valves	52,000	-	-	-	-	-	-	-	-	-	52,000
18	Water main replacement, Forest Glen West	-	-	-	-	-	-	-	-	-	-	-
19	Allocated Employee Salaries	85,000	87,000	90,000	92,000	95,000	-	-	-	-	-	449,000
20	Transfer services to 16" main, Elm St.	-	-	-	-	-	-	-	-	-	-	-
21	Transfer services to 8" main, Oak St.	-	-	-	-	-	-	-	-	-	-	-
22	Transfer services, Oak St., Locust to Birch	108,000	-	-	-	-	-	-	-	-	-	-
23	Transfer services, Hill Road; Church to Ridge	183,000	-	-	-	-	-	-	-	-	-	-
24	Water main replacement, Lake St., Forest Glen to Asb	160,000	-	-	-	-	-	-	-	-	-	-
25	Water main replacement	-	-	-	-	-	-	-	-	-	-	-
26	Remote Metering Technology	-	-	-	-	-	250,000	250,000	250,000	-	-	750,000
27	Sub-Total Distribution [1]	\$ 588,000	\$ 87,000	\$ 90,000	\$ 92,000	\$ 95,000	\$ 250,000	\$ 650,000	\$ 650,000	\$ 400,000	\$ 400,000	\$ 3,302,000
28	Total Existing Capital Improvement Program	\$ 863,000	\$ 370,000	\$ 300,000	\$ 466,000	\$ 555,000	\$ 250,000	\$ 650,000	\$ 650,000	\$ 400,000	\$ 400,000	\$ 4,904,000

[1] Includes an additional \$400,000 per year in undefined CIP for 2022 through 2025

3.4 Financial Planning Scenarios

During the course of the Financial Planning Analysis, multiple financial planning scenarios were examined to understand the impact of the projected funding requirements, with specific emphasis on funding renewal and replacement of Water mains. To consistently evaluate the effectiveness of the scenarios, the following guiding principles were considered in the development of these plans.

1. Minimize the need for sudden and substantial revenue adjustments.
2. Maintain projected operating reserves each year in an amount equal to a minimum of 33 percent of total revenue requirements, which includes operation and maintenance expenses, payment in lieu of taxes, and where applicable, debt service payments.
3. Mitigate new debt issuance where possible.
4. Implement targeted renewal/replacement program by 2025, phasing in the program in accordance with available funding.

Implementing a renewal and replacement program that achieves a 100-year cycle will require an annual investment in water main capital projects of approximately \$2.3 million in today's dollars. Compared to a 2017 retail user charge revenue stream of \$3.3 million, a revenue increase of approximately 70 percent ($\$2.3\text{M}/\$3.3\text{M} = 70$ percent) would be necessary in 2017 to cash fund the immediate implementation of this program. For this reason, a phased implementation of the renewal and replacement program was considered preferable, and the potential use of debt was considered to initiate the renewal and replacement program.

In this report, three financial planning scenarios are reviewed in detail. All scenarios fund the "baseline" CIP depicted previously in Table 3-5, adequately fund operating costs, and maintain appropriate reserves. A renewal and replacement program that requires \$2.3 million in funding today's dollars will amount to a \$2.9 million requirement by 2025, assuming inflation of 3 percent annually. All scenarios provide funding necessary to implement a 100-year cycle renewal and replacement program by 2025; however, the scenarios differ in how quickly the program is implemented. The featured scenarios are listed in Table 3-6.

Table 3-6: Financial Planning Scenario Descriptions

Scenario Number	Description
1	Stable Revenue Increases / \$3M General Fund Loan
2	Front Loaded Revenue Increases / No Debt
3	Stable Revenue Increases / \$24M Revenue Bond Debt

3.4.1 Scenario 1 - Stable Revenue Increases / \$3M General Fund Loan

Scenario 1 represents the recommended scenario, implementing the renewal and replacement program with approximately \$1.0 million in funding in 2017, and climbing to a \$2.9 million funding level by 2025. A threshold of \$2.9 million in 2025 is the estimated spending level required to achieve the 100-year replacement cycle. Scenario 1 achieves funding by proposing revenue increases of 8.5 percent annually. Additionally, under Scenario 1 the Water Utility is proposed to borrow \$1.0 million annually from the General Fund for the first three years (2017, 2018, & 2019) to jump start the renewal and replacement program.

A detailed cash flow for the Scenario 1 - Stable Revenue Increases / \$3M General Fund Loan is shown in Table 3-7. Line 1 of Table 3-7 shows user revenues under existing rates, as shown previously on Line 6 of Table 3-3. Lines 2 through 11 of Table 3-7 propose revenue increases of 8.5 percent per year for 2017 through 2025. Northfield user revenue is shown on Line 13. Under the terms of this wholesale contract, rates are based on an average of regional water purveyor wholesale rates. This average is recalibrated periodically, with the next recalibration set to occur in 2018. In between recalibrations, the rate is adjusted on the basis of the CPI. The revenue forecast shown on Line 13 assumes a 10 percent increase is realized in 2018 due to recalibration of the regional average. Annual CPI-based increases of 1.5 percent are assumed starting in 2019.

Miscellaneous revenue sources are shown on Lines 15 through 18 of Table 3-7. These revenue sources are estimated based on the 2016 budget and are projected to remain consistent over the study period. The total Water Utility revenue, including user charges, wholesale revenue, and miscellaneous revenue is shown on Line 19.

Operating revenue requirements are shown on Lines 20 through 25 of Table 3-7 and include O&M expenses, payment in lieu of taxes, and debt service obligations. O&M expenses, shown on Line 20, are as forecasted previously in Table 3-4.

Payment in lieu of taxes is shown on Line 21 of Table 3-7. This obligation is typically based on 8 percent of prior year's rate revenue. In Scenario 1, however, payment in lieu of taxes is capped at the current budget level of approximately \$275,000 per year. This approach was taken to maximize the benefit of the incremental revenue raised under this scenario for the primary purpose of reinvestment in water main renewal and replacement. In so doing, nearly \$1.3 million of additional renewal and replacement projects can be implemented by 2025 under the proposed revenue increases.

As shown on Line 23, debt issuance is anticipated in Scenario 1. Three \$1.0 million loans from the General Fund are included in this scenario to provide funding to jump start the main renewal and replacement program. Payback terms assume an interest rate of 2.0 percent on each loan, and a duration of 20 years. These terms are comparable to those currently offered by Illinois Environmental Protection Agency (IEPA). The intent of these loans is to provide access to funding at available IEPA market rates for the Water Utility without the administrative burden that typically accompanies IEPA loans; at the same time, the General Fund would benefit from the interest earnings on these loans.

Total revenue requirements are summarized on Line 25. Total requirements are then deducted from total revenue on Line 19, providing annual operating balance on Line 26. Lines 27 through 33 of Table 3-7 provide a summary of the operating fund balance activity under Scenario 1. As shown by Line 33, the Operations Fund reserve policy of 33 percent of revenue requirements is projected to be met. Expressed as days of revenue requirements, the operating reserve balance ranges from 120 to 126 days, which is a reasonable result compared to industry norms. Burns & McDonnell typically recommends a minimum of 90 days, and ratings agencies such as Fitch Ratings considers 90 to 360 days to be a mid-range target.

Funds not required to meet operating expenses or reserve requirements are available to finance capital projects. Table 3-7 provides a summary of capital project funding on Lines 35 through 42. The sources of cash for the capital plan are provided in Lines 35 through 38 and include beginning balances, debt issuance proceeds, and transfers from operating cash flow. As noted on Line 36, loan proceeds totaling \$3.0 million from the General Fund are proposed. Transfers from operating revenues are shown on Line 37.

Uses of capital funds are shown on Lines 39 and 40 of Table 3-7. The baseline CIP previously shown in Table 3-5 is included on Line 39. Renewal and replacement spending is shown on Line 40, starting at

\$1.0 million in 2017 and climbing to \$2.9 million by 2025. Reinvestment of \$2.9 million in 2025 represents an amount generally equivalent to a 100-year replacement cycle for the Village's water mains.

The General Fund loans enable the renewal and replacement program to fund \$1.0 million of projects annually in 2017, 2018, and 2019 while the impact of revenue adjustments accumulates. By 2020, no additional debt is projected, and all renewal and replacement projects through the end of the study period are funded through available cash. Overall, the total CIP including the baseline CIP and renewal and replacement amounts to just over \$18.0 million from 2016 to 2025. Loan funding of \$3.0 million represents less than 17 percent debt funded capital, with 83 percent cash funded. This ratio is favorable compared to industry standards and represents a low level of debt financing. Burns & McDonnell has worked with many utilities that strive to cash fund 15 to 20 percent of their capital program through cash. Fitch Ratings considers the ability to fund capital plans with 50 percent or more from cash to be in its "stronger" or best performance category.

Table 3-7: Scenario 1 - Stable Revenue Increases / \$3M General Fund Loan

Line No.	Projected										
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Water Utility Operating Flow of Funds											
1	Revenue Under Existing Rates	3,282,800	3,269,100	3,255,400	3,242,100	3,228,400	3,215,100	3,201,800	3,188,500	3,175,200	3,162,200
<u>Proposed Revenue Adjustments</u>											
	<u>Year</u>	<u>Month</u>	<u>Increase</u>								
2	2016	1	0.00%	-	-	-	-	-	-	-	-
3	2017	2	8.50%	254,700	276,700	275,600	274,400	273,300	272,200	271,000	269,900
4	2018	2	8.50%		275,200	299,000	297,700	296,500	295,300	294,100	292,800
5	2019	2	8.50%			297,400	323,000	321,700	320,400	319,100	317,700
6	2020	2	8.50%				321,300	349,100	347,600	346,200	344,700
7	2021	2	8.50%					347,200	377,200	375,600	374,000
8	2022	2	8.50%						375,100	407,500	405,800
9	2023	2	8.50%							405,300	440,300
10	2024	2	8.50%								437,900
11	2025	2	8.50%								473,200
12	Total Proposed Additional Revenue	-	254,700	551,900	872,000	1,216,400	1,587,800	1,987,800	2,418,800	2,883,100	3,384,300
13	Northfield	575,000	575,000	632,500	642,000	651,600	661,400	671,300	681,400	691,600	702,000
14	Total Water User Charge Revenue	3,857,800	4,098,800	4,439,800	4,756,100	5,096,400	5,464,300	5,860,900	6,288,700	6,749,900	7,248,500
<u>Miscellaneous Revenue</u>											
15	Water Service Penalties	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
16	Water Service Fees - Water Connection	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
17	Interest Income	700	700	700	700	700	700	700	700	700	700
18	Total Miscellaneous Revenue	93,200	93,200	93,200	93,200	93,200	93,200	93,200	93,200	93,200	93,200
19	Grand Total Water Revenue	3,951,000	4,192,000	4,533,000	4,849,300	5,189,600	5,557,500	5,954,100	6,381,900	6,843,100	7,341,700
<u>Revenue Requirements</u>											
20	Operation and Maintenance Expense	3,087,400	3,177,200	3,279,000	3,381,400	3,487,500	3,597,500	3,711,400	3,829,300	3,951,400	4,078,100
21	Payment in Lieu of Taxes	275,000	275,000	275,000	275,000	275,000	275,000	275,000	275,000	275,000	275,000
<u>Debt Service</u>											
22	Existing Debt	-	-	-	-	-	-	-	-	-	-
23	Proposed Debt	-	-	61,200	122,400	183,600	183,600	183,600	183,600	183,600	183,600
24	Total Debt Service	-	-	61,200	122,400	183,600	183,600	183,600	183,600	183,600	183,600
25	Total Revenue Requirements	3,362,400	3,452,200	3,615,200	3,778,800	3,946,100	4,056,100	4,170,000	4,287,900	4,410,000	4,536,700
26	Annual Operating Balance	588,600	739,800	917,800	1,070,500	1,243,500	1,501,400	1,784,100	2,094,000	2,433,100	2,805,000
<u>Water Operations Fund</u>											
<u>Sources</u>											
27	Beginning Balance	1,448,485	1,109,585	1,139,185	1,192,985	1,246,985	1,302,185	1,338,485	1,376,085	1,414,985	1,455,285
28	Annual Operating Balance	588,600	739,800	917,800	1,070,500	1,243,500	1,501,400	1,784,100	2,094,000	2,433,100	2,805,000
29	Total Operations Fund Sources	2,037,085	1,849,385	2,056,985	2,263,485	2,490,485	2,803,585	3,122,585	3,470,085	3,848,085	4,260,285
<u>Uses</u>											
30	Transfer to Capital	927,500	710,200	864,000	1,016,500	1,188,300	1,465,100	1,746,500	2,055,100	2,392,800	2,763,200
31	Operating Fund Ending Balance	1,109,585	1,139,185	1,192,985	1,246,985	1,302,185	1,338,485	1,376,085	1,414,985	1,455,285	1,497,085
32	Days O&M	120	120	123	124	126	126	126	126	126	126
33	Balance as % of Total Rev Req (33% Min)	33%									
34	Debt Service Coverage	-	-	20.49	11.99	9.27	10.68	12.22	13.90	15.75	17.78
<u>Water Capital Fund</u>											
<u>Sources</u>											
35	Beginning Balance	-	64,500	404,700	968,700	1,519,200	1,052,500	1,067,600	864,100	669,200	662,000
36	Debt Issuance	-	1,000,000	1,000,000	1,000,000	-	-	-	-	-	-
37	Transfer from Operations	927,500	710,200	864,000	1,016,500	1,188,300	1,465,100	1,746,500	2,055,100	2,392,800	2,763,200
38	Total Capital Fund Sources	927,500	1,774,700	2,268,700	2,985,200	2,707,500	2,517,600	2,814,100	2,919,200	3,062,000	3,425,200
<u>Uses</u>											
39	CIP	863,000	370,000	300,000	466,000	555,000	250,000	650,000	650,000	400,000	400,000
40	Additional Renewal & Replacement	-	1,000,000	1,000,000	1,000,000	1,100,000	1,200,000	1,300,000	1,600,000	2,000,000	2,900,000
41	Capital Fund Ending Balance	64,500	404,700	968,700	1,519,200	1,052,500	1,067,600	864,100	669,200	662,000	125,200
42	Capital Balance as % of Total Rev Req	2%	12%	27%	40%	27%	26%	21%	16%	15%	3%

3.4.2 Scenario 2 - Front Loaded Revenue Increases / No Debt

Under Scenario 2, no debt is issued to fund renewal and replacement projects. To assist in initiating the renewal and replacement program, a larger initial revenue increase is of 20 percent is proposed in 2017, followed by 7.5 percent increases per year thereafter. Despite the larger initial increase, initial funding for renewal and replacement projects is expected to be limited to \$450,000. However, renewal and replacement funding is expected to grow over time to achieve the \$2.9 million phased-in target by 2025. Table 3-8 provides a detailed cash flow for Scenario 2.

Many of the forecasting assumptions described in Scenario 2 (Table 3-8) are identical to Scenario 1 (Table 3-7). Differences are highlighted below.

- Revenue adjustments are more aggressively front-loaded on Lines 2 through 11 in Scenario 2 (Table 3-8).
- Payment in lieu of tax is forecasted as 8 percent of prior year's revenues, rather than capping at \$275,000 per year. If Scenario 2 capped payment in lieu of tax at \$275,000 annually, approximately \$1.45 million in additional renewal and replacement could be implemented.
- No debt is issued in Scenario 2.
- Renewal and replacement projects initiate at a lower level in Scenario 2, amounting to \$1.7 million from 2017-2019, compared to \$3.0 million in Scenario 1.

As shown on Lines 39 and 40 of Table 3-8, Scenario 2 funds approximately \$17.30 million in capital improvements, including both baseline improvements as well as the renewal and replacement program. All capital projects are issued using projected cash balances; no debt is issued in Scenario 2.

Table 3-8: Scenario 2 - Front Loaded Revenue Increases / No Debt Financial Plan

Line No.	Projected										
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Water Utility Operating Flow of Funds											
1	Revenue Under Existing Rates	3,282,800	3,269,100	3,255,400	3,242,100	3,228,400	3,215,100	3,201,800	3,188,500	3,175,200	3,162,200
<u>Proposed Revenue Adjustments</u>											
	<u>Year</u>	<u>Month</u>	<u>Increase</u>								
2	2016	1	0.00%	-	-	-	-	-	-	-	-
3	2017	2	20.00%	599,300	651,100	648,400	645,700	643,000	640,400	637,700	635,000
4	2018	2	7.50%		268,600	291,800	290,600	289,400	288,200	287,000	285,800
5	2019	2	7.50%			287,500	312,400	311,100	309,800	308,500	307,200
6	2020	2	7.50%				307,800	334,400	333,000	331,600	330,200
7	2021	2	7.50%					329,500	358,000	356,500	355,000
8	2022	2	7.50%						352,800	383,200	381,600
9	2023	2	7.50%							377,600	410,300
10	2024	2	7.50%								404,300
11	2025	2	7.50%								432,800
12	Total Proposed Additional Revenue	-	599,300	919,700	1,227,700	1,556,500	1,907,400	2,282,200	2,682,100	3,109,400	3,566,100
13	Northfield	575,000	575,000	632,500	642,000	651,600	661,400	671,300	681,400	691,600	702,000
14	Total Water User Charge Revenue	3,857,800	4,443,400	4,807,600	5,111,800	5,436,500	5,783,900	6,155,300	6,552,000	6,976,200	7,430,300
<u>Miscellaneous Revenue</u>											
15	Water Service Penalties	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
16	Water Service Fees - Water Connection	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
17	Interest Income	700	700	700	700	700	700	700	700	700	700
18	Total Miscellaneous Revenue	93,200	93,200	93,200	93,200	93,200	93,200	93,200	93,200	93,200	93,200
19	Grand Total Water Revenue	3,951,000	4,536,600	4,900,800	5,205,000	5,529,700	5,877,100	6,248,500	6,645,200	7,069,400	7,523,500
<u>Revenue Requirements</u>											
20	Operation and Maintenance Expense	3,087,400	3,177,200	3,279,000	3,381,400	3,487,500	3,597,500	3,711,400	3,829,300	3,951,400	4,078,100
21	Payment in Lieu of Taxes	276,600	308,600	355,500	384,600	408,900	434,900	462,700	492,400	524,200	558,100
<u>Debt Service</u>											
22	Existing Debt	-	-	-	-	-	-	-	-	-	-
23	Proposed Debt	-	-	-	-	-	-	-	-	-	-
24	Total Debt Service	-	-	-	-	-	-	-	-	-	-
25	Total Revenue Requirements	3,364,000	3,485,800	3,634,500	3,766,000	3,896,400	4,032,400	4,174,100	4,321,700	4,475,600	4,636,200
26	Annual Operating Balance	587,000	1,050,800	1,266,300	1,439,000	1,633,300	1,844,700	2,074,400	2,323,500	2,593,800	2,887,300
<u>Water Operations Fund Sources</u>											
27	Beginning Balance	1,448,485	1,110,085	1,150,285	1,199,385	1,242,785	1,285,785	1,330,685	1,377,485	1,426,185	1,476,985
28	Annual Operating Balance	587,000	1,050,800	1,266,300	1,439,000	1,633,300	1,844,700	2,074,400	2,323,500	2,593,800	2,887,300
29	Total Operations Fund Sources	2,035,485	2,160,885	2,416,585	2,638,385	2,876,085	3,130,485	3,405,085	3,700,985	4,019,985	4,364,285
<u>Uses</u>											
30	Transfer to Capital	925,400	1,010,600	1,217,200	1,395,600	1,590,300	1,799,800	2,027,600	2,274,800	2,543,000	2,834,300
31	Operating Fund Ending Balance	1,110,085	1,150,285	1,199,385	1,242,785	1,285,785	1,330,685	1,377,485	1,426,185	1,476,985	1,529,985
32	Days O&M	120									
33	Balance as % of Total Rev Req (33% Min)	33%									
34	Debt Service Coverage	-									
<u>Water Capital Fund Sources</u>											
35	Beginning Balance	-	62,400	253,000	600,900	810,300	934,500	1,331,800	1,251,500	1,032,100	842,200
36	Debt Issuance	-	-	-	-	-	-	-	-	-	-
37	Transfer from Operations	925,400	1,010,600	1,217,200	1,395,600	1,590,300	1,799,800	2,027,600	2,274,800	2,543,000	2,834,300
38	Total Capital Fund Sources	925,400	1,073,000	1,470,200	1,996,500	2,400,600	2,734,300	3,359,400	3,526,300	3,575,100	3,676,500
<u>Uses</u>											
39	CIP	863,000	370,000	300,000	466,000	555,000	250,000	650,000	650,000	400,000	400,000
40	Additional Renewal & Replacement	-	450,000	569,300	720,200	911,100	1,152,500	1,457,900	1,844,200	2,332,900	2,951,100
41	Capital Fund Ending Balance	62,400	253,000	600,900	810,300	934,500	1,331,800	1,251,500	1,032,100	842,200	325,400
42	Capital Balance as % of Total Rev Req	2%	7%	17%	22%	24%	33%	30%	24%	19%	7%

3.4.3 Scenario 3 – Stable Revenue Increases / \$24M Revenue Bond Debt

Under Scenario 3, the proposed renewal and replacement program is funded entirely through revenue bonds. The greater reliance on debt in Scenario 3 enables the renewal and replacement program to be funded at a 100-year replacement cycle beginning in 2017 rather than achieving the 100-year replacement cycle spending rate by 2025. However, debt issuance is required every two years, beginning in 2017, and it is reasonable to expect this pattern to continue beyond 2025. Revenue increases proposed under Scenario 3 are 8 percent annually beginning in 2017.

A detailed cash flow for Scenario 3 is shown in Table 3-9. Many of the forecasting assumptions described in Scenario 3 (Table 3-9) are identical to Scenario 1 (Table 3-7). Differences are highlighted below.

- Revenue adjustments are slightly lower in Scenario 3, with 8.0 percent annual increases compared to 8.5 percent under Scenario 1
- Payment in lieu of tax is forecasted as 8 percent of prior year's revenues, rather than capping at \$275,000 per year. If Scenario 2 capped payment in lieu of tax at \$275,000 annually, approximately \$1.20 million in additional renewal and replacement could be implemented.
- All renewal and replacement projects are funded through revenue bonds in Scenario 3. See Line 36 of Table 3-9 for debt issuance amounts, which total \$24.4 million through 2025.
- Renewal and replacement projects initiate at a higher level in Scenario 3, amounting to \$7.1 million from 2017-2019, compared to \$3.0 million in Scenario 1.

The issuance of revenue bonds will require the Village to agree to certain financial performance measures in the debt covenants authorizing the bonds. One of the important measures will be debt service coverage. Debt service coverage is generally calculated as follows:

$$\frac{\text{Net Revenues Available for Debt Service}}{\text{Annual Revenue Bond Principal \& Interest Payments}}$$

Where net revenues available for debt service are generally determined as follows:

$$\begin{aligned} & \text{Operating revenues} - \text{Operation and maintenance expenses} \\ & = \text{Net revenues available for debt service} \end{aligned}$$

Table 3-9: Scenario 3 - Stable Revenue Increases / \$24M Revenue Bond Debt Financial Plan

Line No.	Projected										
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Water Utility Operating Flow of Funds											
1	Revenue Under Existing Rates	3,282,800	3,269,100	3,255,400	3,242,100	3,228,400	3,215,100	3,201,800	3,188,500	3,175,200	3,162,200
<u>Proposed Revenue Adjustments</u>											
	<u>Year</u>	<u>Month</u>	<u>Increase</u>								
2	2016	1	0.00%	-	-	-	-	-	-	-	-
3	2017	2	8.00%	239,700	260,400	259,400	258,300	257,200	256,100	255,100	254,000
4	2018	2	8.00%		257,800	280,100	278,900	277,800	276,600	275,500	274,300
5	2019	2	8.00%			277,300	301,200	300,000	298,800	297,500	296,300
6	2020	2	8.00%				298,200	324,000	322,700	321,300	320,000
7	2021	2	8.00%					320,800	348,500	347,000	345,600
8	2022	2	8.00%						345,000	374,800	373,200
9	2023	2	8.00%							371,000	403,100
10	2024	2	8.00%								399,100
11	2025	2	8.00%								429,200
12	Total Proposed Additional Revenue	-	239,700	518,200	816,800	1,136,600	1,479,800	1,847,700	2,242,200	2,665,600	3,120,100
13	Northfield	575,000	575,000	632,500	642,000	651,600	661,400	671,300	681,400	691,600	702,000
14	Total Water User Charge Revenue	3,857,800	4,083,800	4,406,100	4,700,900	5,016,600	5,356,300	5,720,800	6,112,100	6,532,400	6,984,300
<u>Miscellaneous Revenue</u>											
15	Water Service Penalties	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
16	Water Service Fees - Water Connection	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
17	Interest Income	700	700	700	700	700	700	700	700	700	700
18	Total Miscellaneous Revenue	93,200	93,200	93,200	93,200	93,200	93,200	93,200	93,200	93,200	93,200
19	Grand Total Water Revenue	3,951,000	4,177,000	4,499,300	4,794,100	5,109,800	5,449,500	5,814,000	6,205,300	6,625,600	7,077,500
<u>Revenue Requirements</u>											
20	Operation and Maintenance Expense	3,087,400	3,177,200	3,279,000	3,381,400	3,487,500	3,597,500	3,711,400	3,829,300	3,951,400	4,078,100
21	Payment in Lieu of Taxes	276,600	308,600	326,700	352,500	376,100	401,300	428,500	457,700	489,000	522,600
<u>Debt Service</u>											
22	Existing Debt	-	-	-	-	-	-	-	-	-	-
23	Proposed Debt	-	-	336,300	336,300	691,200	691,200	1,062,800	1,062,800	1,449,300	1,449,300
24	Total Debt Service	-	-	336,300	336,300	691,200	691,200	1,062,800	1,062,800	1,449,300	1,449,300
25	Total Revenue Requirements	3,364,000	3,485,800	3,942,000	4,070,200	4,554,800	4,690,000	5,202,700	5,349,800	5,889,700	6,050,000
26	Annual Operating Balance	587,000	691,200	557,300	723,900	555,000	759,500	611,300	855,500	735,900	1,027,500
Water Operations Fund											
<u>Sources</u>											
27	Beginning Balance	1,448,485	1,110,085	1,150,285	1,300,885	1,343,185	1,503,085	1,547,685	1,716,885	1,765,385	1,943,585
28	Annual Operating Balance	587,000	691,200	557,300	723,900	555,000	759,500	611,300	855,500	735,900	1,027,500
29	Total Operations Fund Sources	2,035,485	1,801,285	1,707,585	2,024,785	1,898,185	2,262,585	2,158,985	2,572,385	2,501,285	2,971,085
<u>Uses</u>											
30	Transfer to Capital	925,400	651,000	406,700	681,600	395,100	714,900	442,100	807,000	557,700	974,600
31	Operating Fund Ending Balance	1,110,085	1,150,285	1,300,885	1,343,185	1,503,085	1,547,685	1,716,885	1,765,385	1,943,585	1,996,485
32	Days of operating expenses	120	120	132	131	142	141	151	150	160	158
33	Balance as % of Total Rev Req (33% Min)	33%									
34	Debt Service Coverage	-	-	3.63	4.20	2.35	2.68	1.98	2.24	1.85	2.07
Water Capital Fund											
<u>Sources</u>											
35	Beginning Balance	-	62,400	2,568,400	306,100	2,856,600	183,400	3,059,600	185,300	2,795,900	124,800
36	Net Debt Issuance	-	4,525,000	-	4,775,000	-	5,000,000	-	5,200,000	-	4,900,000
37	Transfer from Operations	925,400	651,000	406,700	681,600	395,100	714,900	442,100	807,000	557,700	974,600
38	Total Capital Fund Sources	925,400	5,238,400	2,975,100	5,762,700	3,251,700	5,898,300	3,501,700	6,192,300	3,353,600	5,999,400
<u>Uses</u>											
39	CIP	863,000	370,000	300,000	466,000	555,000	250,000	650,000	650,000	400,000	400,000
40	Additional Renewal & Replacement	-	2,300,000	2,369,000	2,440,100	2,513,300	2,588,700	2,666,400	2,746,400	2,828,800	2,913,700
41	Capital Fund Ending Balance	62,400	2,568,400	306,100	2,856,600	183,400	3,059,600	185,300	2,795,900	124,800	2,685,700
42	Capital Balance as % of Total Rev Req	2%	74%	8%	70%	4%	65%	4%	52%	2%	44%

If debt service coverage were to be exactly 1.00x, it indicates that after a utility receives its revenue and pays its annual O&M, the remaining dollars on hand are just enough to pay the principal and interest payments on its debt. However, typical minimum debt service coverage requirements range from 1.20x to 1.30x, providing a degree of security that a utility has the financial wherewithal to meet its debt obligations. In Table 3-9, debt service coverage is projected to achieve a minimum of 1.85x through 2025 as shown on Line 34. This performance is well above typical minimum requirements and benefits from the absence of existing debt.

With a capital plan amounting to approximately \$28.3 million, and revenue bonds funding approximately \$24.4 million, Scenario 3 would debt fund just over 86 percent of the capital plan and cash fund 14 percent. Shifting the financial plan to rely less on debt in Scenario 3 would require substantially higher revenue increases.

3.5 Financial Planning Scenario Summary and Recommendation

This report summarizes three financial planning scenarios considered the most implementable. Overall, many more scenarios were evaluated as the Study progressed. A summary of the key financial assumptions among the three scenarios is shown on Table 3-10.

All three scenarios fund the baseline CIP, and provide sufficient funding by 2025 to achieve a 100-year reinvestment rate in renewal and replacement of mains. Scenario 1 relies on \$3.0 million in loans from the General Fund to jump start the renewal and replacement program. Scenario 2 avoids debt, but requires a large increase in 2017 and implements the renewal and replacement program at a more gradual pace compared to Scenario 1. Scenario 3 rapidly implements the renewal and replacement program but requires substantial debt issuance to do it.

Scenario 1 represents the recommended approach which minimizes revenue increases, provides stable increases going forward, and funds a phased-in renewal and replacement program with relatively little reliance on debt.

Table 3-10: Summary of Key Financial Assumptions by Scenario

Indicator	Scenario 1	Scenario 2	Scenario 3
	General Fund Loan	No Debt	Revenue Bond Debt
Total Baseline CIP	\$ 4,904,000	\$ 4,904,000	\$ 4,904,000
Renewal & Replacement CIP 2016-2020	\$ 4,100,000	\$ 2,650,600	\$ 9,622,400
Renewal & Replacement CIP 2021-2025	\$ 9,000,000	\$ 9,738,600	\$ 13,744,000
Total Renewal/Replacement	\$ 13,100,000	\$ 12,389,200	\$ 23,366,400
2017 Renewal & Replacement Spend	\$ 1,000,000	\$ 450,000	\$ 2,300,000
2025 Renewal & Replacement Spend	\$ 2,900,000	\$ 2,951,100	\$ 2,913,700
Number of Debt Issues	3	0	5
Total Debt Issued	\$ 3,000,000	\$ -	\$ 24,400,000
Revenue Adjustment Proposed			
FY 2017 (Effective Jan 1 each year)	8.50%	20.00%	8.00%
FY 2018	8.50%	7.50%	8.00%
FY 2019	8.50%	7.50%	8.00%
FY 2020	8.50%	7.50%	8.00%
FY 2021	8.50%	7.50%	8.00%
FY 2022	8.50%	7.50%	8.00%
FY 2023	8.50%	7.50%	8.00%
FY 2024	8.50%	7.50%	8.00%
FY 2025	8.50%	7.50%	8.00%
Cumulative Increase	108.39%	114.02%	99.90%

For the cost of service analysis and rate analysis, which is described in the following sections of this report, the financial plan and its associated recommendations for Scenario 1 is used.

4.0 COST OF SERVICE ANALYSIS

Cost of service analysis and recommendations regarding proposed rates are dependent on the preliminary recommendations regarding the Water Main Replacement Plan and financial planning, including proposed revenue increases. Completion of this section of the report will occur after feedback is received regarding the water main replacement plan and financial plan.

4.1 Introduction

The cost of service analysis is focused on determining revenue responsibility. Once the overall need for revenue increases is identified through the financial planning, the results of the cost of service analysis help answer the following question:

- "Which customer class or classes are responsible for the costs incurred to provide service?"

To determine each customer class' equitable share of the cost of providing utility service, the cost of service analysis compares the revenues received from each customer class under the existing schedule of rates with the allocated cost responsibility for that class.

The cost of service analysis was developed in the following steps:

1. Determine the net revenue requirements to be recovered from user charges.
2. Estimate the system test period units of service.
3. Allocate test period operating and capital costs.
4. Develop test period unit costs of service by class.
5. Assign the costs of service to customer classes.

To equitably develop rates for water service, the Water Utility's customer classes are allocated their respective share of the total cost of service according to their use of the system. Cost are assigned through consideration of the amount of water used, peak demand characteristics, customer costs, and other relevant factors. Ultimately, proposed rates must be sufficient to meet the net revenue requirements forecasted for the Water Utility.

4.2 Net Revenue Requirements

4.3 Cost of Service Methodology

4.4 Functional Cost Assignment

4.4.1 Operating Expenses

4.4.2 Capital Costs

4.5 Units of Service

4.6 Unit Cost Development

4.7 Allocation of Costs to Customer Classes

5.0 PROPOSED RATE DESIGN

Cost of service analysis and recommendations regarding proposed rates are dependent on the preliminary recommendations regarding the Water Main Replacement Plan and financial planning, including proposed revenue increases. Completion of this section of the report will occur after feedback is received regarding the water main replacement plan and financial plan.

5.1 Introduction

The primary focus of Step 4, Rate Design is the examination of revenue recovery. Generally speaking, the objective is to design rates for the Water Utility to achieve the following:

- Generate adequate revenues to meet the projected operating and capital costs, while maintaining sound financial performance.
- Provide revenue stability.
- Provide cost recovery that is reasonably commensurate with the cost of providing service.

5.2 Existing Water Rates

5.3 Proposed Water Rates

5.4 Revenue under Proposed Water Rates

5.5 Typical Bills and Residential Bill Comparison

6.0 RECOMMENDATIONS

6.1 Water Main Replacement

Burns & McDonnell recommends the water main segments be replaced as financial resources allow. Replacing high ranked water mains prior to failure will assist in maintaining reliable service, provide sufficient fire flow and manage risks. Burns & McDonnell recommends that 4-inch and 6-inch diameter water main be replaced with at least an 8-inch diameter water main.

In cases where a larger diameter transmission main is parallel to a smaller diameter pipe that is in need of replacement, the smaller diameter pipe can be abandoned and services can be connected to the transmission main. This option will reduce replacement costs and residence disruption but should be evaluated on a case by case basis taking into consideration such parameters as transmission main pressures, capacity impact and long term benefits.

Coordinating with the rate recommendations, Burns & McDonnell organized water segments over a nine (9) year period that aligns with Financial Plan Scenario 1 as shown in Table 6-1. The goal was to group water main segments together in a manner that was consistent with the financial plan which has a proposed increasing annual water main replacement budget from \$1,000,000 million per year to \$2,900,000 million per year by 2025.

Table 6-1: Cost Estimate for Recommended Segments

Segment	Replacement Year	Length (feet)	Estimated Cost	Scenario 1 Funding for Renewal / Replacement
Cherry Street (Birch/Ridge)	2017	1304	\$958,000	\$1,000,000
Spruce Street (Glendale/Locust)	2018	1154	\$847,000	\$1,000,000
Ash Street (Glendale/Birch)	2019	1469	\$1,079,000	\$1,000,000
Hackberry Lane (Hibbard/end)	2020	1397	\$1,026,000	\$1,100,000
Ash Street (Birch/Green Bay)	2021	1679	\$1,233,000	\$1,200,000
Spruce Street (Locust/Green Bay)	2022	1888	\$1,387,000	\$1,300,000
Elm Street (Locust/Provident) & N/S Forest Glen Drive	2023	2121	\$1,558,000	\$1,600,000
Asbury Avenue (Grove/Lake)	2024	2792	\$2,050,000	\$2,000,000
Cherry Street (Maple/Sheridan) & Sunset Road (Poplar/Essex)	2025	3953	\$2,903,000	\$2,900,000

The intent of the Plan was to allow annual prioritization of water main segments based on annual budgets and updated water system operation and maintenance data. Depending on annual construction costs, segments can be modified, increased or decreased, to meet annual budgets.

6.2 Water Main Replacement Plan Updates

An advantage of the Plan is the parameter spreadsheet document that can be updated annually or at some other frequency. Keeping this up to date will aid in determining which water mains should have priority for being replaced within the system on an annual basis. Segments can be added and removed as deemed necessary based on budget and recent water system operation and maintenance data.

Adding more parameters can help identify important segments within the system. Parameters such as depth of bury or corrosive soils can be recorded and input into the table.

6.3 Financial Planning

Several financial planning scenarios were evaluated to fund the operating and capital needs of the system. Scenario 1 is recommended based its ability to meet the following guiding principles:

1. Minimize the need for sudden and substantial revenue adjustments.
2. Maintain projected operating reserves each year in an amount equal to a minimum of 33 percent of total revenue requirements, which includes operation and maintenance expenses, payment in lieu of taxes, and where applicable, debt service payments.

3. Mitigate new debt issuance where possible.
4. Implement targeted renewal/replacement program by 2025, phasing in the program in accordance with available funding.

Scenario 1 recommends 8.5 percent annual revenue increases for 2016 through 2025, at which point renewal and replacement funding is projected to be sufficient to implement the renewal/replacement program at a 100-year replacement rate.

6.4 Proposed Rate Structure & Rate Design

Recommendations regarding proposed rates are dependent on the preliminary recommendations regarding the Water Main Replacement Plan and financial planning, including proposed revenue increases.

Completion of recommendations on proposed rate structure and rate design will occur after feedback is received regarding the water main replacement plan and financial plan.

EXHIBIT 1- INPUT PARAMETERS

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Whitebridge Hill Rd (Whitebridge/Sheridan)		1661	6	5	60	0	3	6	6	1	5	2	0	1	20
Taylorport Ln (end/Sheridan)		385	6	5	115	0	2		0	0	0	1	0	1	4
Sheridan Rd (Scott/Sheridan)		1707	6	5	115	0	1	6	1	0	6	1	0	1	13
Sheridan Rd (Sheridan/Private)		1526	6	5	100	0	1	6	1	1	9	1	0	1	10
Sheridan Rd (Private/Tower)		985	6	5	115	0	0		0	0	0	1	0	1	5
Crescent Ln (end/Old Green Bay) - 4"		889	4	5	95	0	1		0	0	0	2	0	1	3
Crescent Ln (end/Fisher) - 6"		930	6	5	110	0	2		0	0	0	1	0	1	11
Fisher Ln (Old Green Bay/Sheridan)		1176	6	5	105	0	0	6	2	0	0	1	0	1	11
Old Green Bay Rd (Fisher/Tower)		1605	6	5	100	0	0	6	2	0	4	1	0	1	16
Hubbard Pl (end/Old Green Bay)		458	6	5	65	0	2		0	0	0	1	0	1	5
Ravine Rd (end/Sheridan)		828	6	5	65	0	2		0	0	0	1	0	1	9
Sheridan Rd (977 Sheridan Rd)		379	6	5	115	0	2		0	0	0	1	0	1	5
Glen Oak Rd (Sheridan/end)		447	6	5	50	0	2		0	0	0	1	0	1	5
Private Rd (Old Green Bay/951 Private)		815	6	5	90	0	1	5	0	1	1	1	0	1	5
Private Rd (951 Private/Sheridan)		1351	4	5	90	0	1	5	0	0	2	2	0	1	6
Tower Manor Dr (end/Tower)		603	4	5	80	0	2		0	0	0	2	0	1	8
Lamson Dr (end/Tower)		526	6	5	115	0	2	5	0	0	1	1	0	1	8
Hill Rd (Westview/Apple Tree)		855	8	5	80	0	0	6	4	1	0	0	0	1	6
S. Indian Hill Rd (Woodley/Indian Hill)		1490	6	5	100	0	1	5	0	1	0	1	0	1	7
S. Indian Hill Rd (Indian Hill/Indian Hill)		3076	6	5	100	0	1	6	2	2	8	1	0	1	10
S. Indian Hill Rd (Indian Hill/Ridge) - North		1024	6	5	115	0	1		0	0	0	1	0	1	8
S. Indian Hill Rd (Indian Hill/Ridge) - South		814	6	5	115	0	1	6	0	1	1	1	0	1	9
N. Indian Hill Rd (Woodley/Indian Hill)		2483	6	5	115	0	0		0	0	0	1	0	1	22
N. Indian Hill Rd (Indian Hill/Indian Hill Club)		1777	6	5	115	0	0		0	0	0	1	0	1	9

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Indian Hill Rd (Indian Hill Club)		2153	6	5	115	0	1	5	1	0	0	1	0	1	5
Indian Hill Rd & Golf Ln (Hill/Indian Hill)		1822	6	5	90	0	2	6	0	0	5	1	0	1	10
Hill Rd (Locust/Ridge)		2783	6	5	115	0	0	6	2	1	2	1	0	1	24
Hill Rd (Ridge/Church) - 4"		1360	4	5	115	0	0	6	3	0	4	2	0	1	8
Forest St (Willow/Hill)		2025	6	5	115	0	0	6	3	0	2	1	1	1	36
Elder Ln (Forest/Church)		818	6	5	100	0	0		0	0	0	1	1	1	12
Garland Ave (Forest/Church)		890	6	5	115	0	0	5	0	0	1	1	0	1	19
Winnetka Ave (Warwick/Sheridan)		2678	6	5	115	0	1	6	5	1	4	1	0	1	27
Hibbard Rd (Sunset/345 Hibbard/Auburn)		1386	6	5	115	0	0	6	3	1	5	1	0	1	11
Willow Rd (Forestway/Hibbard)		1454	12	5	115	1	1	6	0	0	4	0	0	1	1
Oak St (Chestnut/Green Bay)		286	4	5	100	0	3		0	0	0	2	0	3	7
		454	6	5	115	0	2		0	0	0	1	0	3	
Oak St (Locust/Birch)		1336	4	5	120	0	0	6	6	3	6	2	0	1	19
Oak St (Hibbard/Glendale)		1474	6	5	115	0	0	5	2	0	2	1	1	1	25
Oak St (Glendale/Birch)		1469	8	5	115	0	0		0	0	0	0	0	1	60
Willow Rd (Rosewood/Chestnut)		1725	6	5	110	0	0	5	3	1	3	1	0	1	23
Willow Rd (Chestnut/Green Bay)		1648	6	5	115	0	0	5	2	0	1	1	0	1	4
Willow Rd (Hibbard/Locust)		2582	10	5	115	1	0	6	3	0	2	0	0	1	41
Ash St (Hibbard/Glendale)		1564	6	5	115	0	0		0	0	0	1	0	1	44
Ash St (Glendale/Birch)		2535	4	5	115	0	0	6	1	0	3	2	0	1	75
Ash St (Birch/Green Bay)		1679	4	5	115	0	0	5	3	0	3	2	1	1	24
Cherry St (Hibbard/Glendale)		1542	6	5	115	0	0	6	1	0	2	1	0	1	49
Cherry St (Glendale/Birch)		2511	4	5	115	0	0	4	3	2	1	2	0	1	77
Cherry St (Birch/Ridge)		1304	4	5	115	0	0	6	1	1	3	2	0	1	34
Elm St (Locust/Provident)		570	4	5	120	0	1	6	3	1	6	2	0	1	12
Elm St (Provident/Green Bay)		1628	6	5	120	0	0	6	0	0	2	1	0	3	33
Spruce St (Hibbard/Glendale)		1478	6	5	115	0	0	6	1	1	0	1	0	1	21
Spruce St (Glendale/Locust)		1154	4	5	120	0	0	5	0	1	1	2	0	1	39

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Spruce St (Locust/Green Bay)		1888	4	5	120	0	0	6	3	0	1	2	0	3	48
Pine St (Hibbard/Glendale)		1447	6	5	115	0	0	6	1	0	1	1	0	1	17
Pine St (Glendale/Provident)		2054	6	5	115	0	0	5	1	0	0	1	0	1	46
Pine St (Provident/Green Bay)		724	6	5	110	0	0	6	1	0	3	1	0	2	8
Glendale Ave (Oak/Willow)		1317	10	5	115	1	0	6	0	0	2	0	0	1	1
Provident Ave (Pine/Elm)		941	6	5	115	0	0		0	0	0	1	0	1	20
Provident Ave (Elm/Willow)		1854	6	5	115	0	0					1	0	1	44
Linden St (Elm/Willow)		1475	6	5	115	0	0		0	0	0	1	0	3	32
Linden St (Sunset/Hill)		948	4	5	115	0	0	6	0	1	3	2	1	1	11
Linden St (Willow/Sunset)		1333	6	5	115	0	0	5	0	0	2	1	0	1	25
Mt Pleasant St (Birch/Linden)		1158	4	5	115	0	2	6	2	0	2	2	0	1	7
Plum Tree Ln (Hibbard/end)		550	6	5	60	0	3	6	1	0	2	1	0	1	3
Holly Ln (Hibbard/end)		531	6	5	115	0	3	5	0	0	1	1	0	1	3
Trapp Ln (Hibbard/end)		1200	6	5	85	0	3	5	0	1	1	1	0	1	20
Westmoor Tr (Hibbard/end)		1181	6	5	115	0	3	5	0	1	1	1	0	1	19
Hackberry Ln (Hibbard/end)		1397	6	5	115	0	3	6	1	0	2	1	0	1	24
Sunview Ln (Hibbard/end)		1173	6	5	70	0	3	6	1	0	3	1	0	1	27
Westmoor Rd & Laurel Ave (Hibbard/Ardsley)		2598	6	5	115	0	0	6	0	1	6	1	0	1	25
Westmoor Rd (Rosewood/Green Bay)		996	4	5	105	0	0	6	1	0	0	2	0	3	23
		369	6	5	95	0	0		0	0	0	1	0	1	
Rosewood Ave (Laurel/Westmoor)		1019	6	5	115	0	0	6	1	0	2	1	0	1	19
Rosewood Ave (Westmoor/Pine)		1342	6	5	100	0	0		0	0	0	1	0	1	7
Dinsmore Rd & Locust Rd & Starr Rd (Rosewood/Locust)		1746	6	5	100	0	1	6	1	0	1	1	0	1	33
Locust St (Tower/Westmoor)		1326	6	5	110	0	0	6	0	1	1	1	0	1	23
Vine St & Walden Rd (Locust/Westmoor)		1066	6	5	115	0	0	5	0	0	1	1	0	1	20
Walden Rd (Westmoor/Pine)		1672	8	5	105	0	0		0	0	0	0	0	1	26

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Blackthorn Rd (Walden/Pine)		812	6	5	115	0	0		0	0	0	1	0	1	12
Kent Rd & Hamptondale Rd (Hibbard/Chatfield)		1673	6	5	105	0	0	6	0	1	1	1	0	1	20
Chatfield Rd (Kent/Hamptondale)		1322	6	5	105	0	1		0	0	0	1	0	1	21
Chatfield Rd (Hamptondale/Burr)		434	6	5	100	0	0	6	3	0	0	1	0	1	3
Chatfield Rd (Burr/Green Bay)		1055	6	5	90	0	0	4	0	1	0	1	0	3	13
Gordon Ter & Merrill St & Gage St (Scott/Green Bay/Tower)		2402	6	5	115	0	0	6	5	2	1	1	1	3	27
N/S Forest Glen Dr		1621	6	5	115	0	1	6	1	2	4	1	0	1	32
Edgewood Ln (Grove/end)		1691	6	5	115	0	1	5	0	0	1	1	0	1	60
Scott Ave (Grove/Greenwood)		616	6	5	100	0	0	5	1	0	0	1	0	1	20
Scott Ave (Greenwood/Lake)		1985	4	5	110	0	0	5	0	0	2	2	0	1	51
Scott Ave (Lake/Green Bay)		1617	6	5	110	0	0		0	0	0	1	0	3	19
Woodley Rd (Southeast) - 4"		1865	4	5	115	0	3	5	1	0	0	2	1	1	14
Woodley Rd (Southeast) - 6"		1016	6	5	80	0	3	6	1	1	2	1	1	1	7
Woodley Rd (Hibbard/110 Woodley)		2151	6	5	75	0	2		0	0	0	1	1	1	12
Woodley Rd (110 Woodley/75 Woodley Rd)		1283	6	5	65	0	2	5	0	1	1	2	1	1	6
Woodley Rd (81 Woodley Rd/Locust)		2334	6	5	55	0	3		0	0	0	1	1	1	21
Woodley Rd (Hill/45 Woodley)		791	6	5	115	0	1		0	0	0	1	0	1	6
Woodley Rd (45 Woodley/70 Woodley)		1516	6	5	75	0	1		0	0	0	1	0	1	8
Woodley Rd (70 Woodley/96 Woodley)		1789	6	5	80	0	1		0	0	0	1	0	1	17
Woodley Rd (52 Woodley/Locust)		2709	6	5	100	0	2	6	0	1	0	1	1	1	14
Woodley Rd (45 Woodley/10 Woodley)		1993	6	5	80	0	2		0	0	0	1	1	1	10
Woodley Rd (5 Woodley/Locust)		1292	6	5	100	0	1		0	0	0	1	0	1	11
Longmeadow Rd (Longmeadow/Hibbard)		952	8	5	75	0	0		0	0	0	0	0	1	10

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Longmeadow Rd - loop (Longmeadow)		2823	6	5	65	0	2	5	1	0	4	1	0	1	26
Longmeadow Rd - backyard (Longmeadow/Hibbard)		1708	6	5	75	0	2	6	0	0	2	1	1	1	7
Green Bay Rd (Tower/Westmoor)		1422	8	5	115	0	0	6	0	0	1	0	1	3	23
Green Bay Rd (Westmoor/Pine)		1691	8	5	110	0	0	6	0	0	2	0	1	3	23
Green Bay Rd (Pine/Elm)		1096	8	5	120	0	0	5	2	0	0	0	1	3	7
Tower Rd (Green Bay/Sheridan) 1		2496	12	5	95	1	0	6	1	0	0	1	2	3	11
Tower Rd (Green Bay/Sheridan) 2		2836	12	5	95	1	0	4	1	0	0	1	2	3	12
Foxdale (Tower/Humboldt)		2560	4	5	115	0	1	6	0	1	2	2	0	1	77
Lincoln Ave (Tower/Humboldt)		2048	6	5	120	0	0	6	0	0	1	1	0	1	45
Prospect Ave (Tower/Humboldt)		1548	4	5	115	0	0	3	0	0	1	2	0	1	22
Summit St (Foxdale/Prospect)		736	6	5	110	0	0		0	0	0	1	0	1	1
Humboldt Ave (Foxdale/Prospect)		1118	4	5	100	0	2		0	0	0	2	0	1	9
Bryant Ave (Tower/Prospect)		2102	4	5	115	0	0	6	1	0	1	2	1	1	25
Prospect Ave (Humboldt/Lincoln)		1468	4	5	120	0	0	5	0	1	2	2	0	1	4
Lincoln Ave (Humboldt/Elm)		1872	6	5	115	0	0		0	0	0	1	0	1	39
Pine St (Killian/Lincoln)		538	4	5	100	0	0		0	0	0	2	0	1	6
Arbor Vitae Rd (Pine/Elm)		785	6	5	115	0	3		0	0	0	1	0	1	18
Elm St (Lincoln/Maple)		863	6	5	115	0	0	5	0	1	0	1	0	3	14
Elm St (Maple/Sheridan)		1270	4	5	120	0	0	6	2	0	6	2	0	1	20
Spruce St (Maple/Sheridan)		932	4	5	115	0	0		0	0	0	2	0	1	18
Hoyt Ln (Sheridan/Sheridan)		1511	6	5	115	0	0	6	0	1	4	1	0	1	17
Oak St (Maple/Sheridan)		1698	4	5	120	0	0	6	0	1	2	2	0	1	26
Cherry St (Maple/Sheridan)		2262	4	5	120	0	0	6	1	0	3	2	0	1	53
Ash St (Maple/Sheridan)		2764	4	5	115	0	0	6	2	0	1	2	0	1	46
Willow (Maple/Sheridan)		2863	6	5	115	0	1		0	0	0	1	0	1	57
Poplar St (Willow/Orchard)		395	6	5	110	0	0		0	0	0	1	0	1	3

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Walnut (Orchard/Hawthorn)		389	6	5	105	0	0	5	0	0	2	1	0	1	6
Poplar St (Hawthorn/Sunset)		858	6	5	105	0	1	6	1	1	0	1	0	1	6
Myrtle St (Sunset/Hill)		384	6	5	115	0	0		0	0	0	1	0	1	5
Woodland Ave (Willow/Elder)		1109	6	5	115	0	0	4	0	1	0	1	0	1	13
Woodland Ave (Elder/Winnetka)		1534	6	5	105	0	0	5	1	0	1	1	0	1	19
Essex Rd (Elder/Winnetka)		1671	6	5	100	0	0		0	0	0	1	0	1	6
Orchard Ln (Wilson/Fairview)		1618	4	5	115	0	0		0	0	0	2	0	1	38
Hawthorn Ln (Walnut/Fairview)		1327	6	5	115	0	0	5	0	0	1	1	0	1	36
Hawthorn Ln (Fairview/Sheridan)		1158	4	5	105	0	0		0	0	0	2	1	1	19
Elder Ln (Wilson/Woodland)		1525	6	5	115	0	0	6	1	0	2	1	0	1	36
Elder Ln (Woodland/Sheridan)		1030	6	5	110	0	0	4	1	0	1	1	0	1	21
Private drive (Sheridan)		353	4	5	90	0	0		0	0	0	2	0	1	6
Sunset Rd (Poplar/Essex)		2224	6	5	115	0	1	6	0	2	2	1	0	1	50
Sheridan Rd (Willow/Elder)		1151	6	5	115	0	0		0	0	0	1	0	1	12
Sheridan Rd (Elder/Winnetka)		2210	6	5	115	0	0	6	0	0	6	1	0	1	30
Heather Ln & Hickory Ln & Hazel Ln & Sumac Ln (Tower/Hazel)		2784	6	5	75	0	0		0	0	0	1	0	1	30
Boal Pky (Tower/Sumac)		1691	6	5	75	0	1	6	1	0	8	1	1	1	17
Pine Tree Ln (end/Tower)		1485	6	5	80	0	1	6	0	0	3	1	0	1	24
Asbury Ave (Pine Tree/Grove)		1307	6	5	70	0	1		0	0	0	1	0	1	18
Grove St (Scott/Edgewood)		785	6	5	75	0	0	6	0	0	2	1	0	1	7
Tower Rd (Pine Tree/Bell)		985	6	5	90	0	0		0	0	0	1	0	1	51
		1764	10	5	60	1	0		0	0	0	0	0	1	
Grove St & Asbury Ave (Tower/Randolph)		2846	10	5	115	1	0		0	0	0	0	0	1	33
Asbury Ave (Grove/Lake)		2792	4	5	110	0	0	6	3	1	0	2	0	1	68
Asbury Ave (Lake/Gordon)		1397	6	5	115	0	0		0	0	0	1	0	1	37
Euclid Ave & Oakley Ave (Asbury/Gordon)		1198	6	5	115	0	0		0	0	0	1	0	1	18

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Green Bay Rd (Scott/Tower) - 10"		1573	10	5	115	1	0		0	0	0	0	0	3	24
Green Bay Rd (Scott/Tower) - 12"		1746	12	5	100	1	0		0	0	0	0	1	3	10
Tower Rd (Gordon/Green Bay)		1351	10	5	100	1	0		0	0	0	0	0	3	18
Hibbard Rd (Tower/Westmoor)		1304	10	5	90	0	0		0	0	0	0	0	1	8
Hibbard Rd (Sunview Spruce)		838	10	5	60	1	0	6	0	0	2	0	0	1	2
Winnetka Golf Club		2537	6	5	50	0	3	6	0	1	0	1	0	3	3
Ardsley Rd (Tower/Westmoor)		1617	10	5	100	1	0	6	0	0	1	0	0	1	14
Ardsley Rd (Westmoor/Pine)		1470	10	5	90	1	0		0	0	0	0	0	1	15
Burr Ave (Laurel/Westmoor)		551	4	5	105	0	0	6	1	0	1	2	0	1	5
Pelham Rd (Pine/Rosewood)		1513	6	5	85	0	0		0	0	0	1	0	1	10
Elm St (Hibbard/Glendale) - 12"		1510	12	5	60	1	0	6	1	0	2	0	1	1	0
Elm St (Hibbard/Glendale) - 6"		1506	6	5	90	0	0	6	3	2	2	1	1	1	13
Locust St (Spruce/Elm)		483	8	5	75	0	0		0	0	0	0	0	1	3
Elm St (Glendale/Locust)		1155	16	5	60	1	0		0	0	0	0	2	1	37
Elm St (Locust/Birch)		1310	16	5	90	1	0	4	0	0	1	0	2	1	3
Birch St (Elm/Oak)		443	12	5	100	1	0		0	0	0	0	1	1	1
Birch St (Cherry/Willow)		879	12	5	115	1	0		0	0	0	0	1	1	5
Birch St (Willow/Hill)		2134	6	5	95	0	0	6	2	0	5	1	0	1	6
Chestnut St (Willow/Hill)		2538	6	5	115	0	0	6	1	0	3	1	0	1	31
Ridge Ave (Cherry/Hill) - 4"		1996	4	5	115	0	0	5	0	1	1	2	0	1	26
Ridge Ave (Cherry/Hill) - 10"		1986	10	5	115	1	0		0	0	0	0	0	1	18
Hibbard Rd (Ash/Willow)		409	16	5	95	1	0		0	0	0	0	2	1	0
Ash St (Hibbard/Glendale) - 16"		2137	16	5	95	1	0		0	0	0	0	2	1	5
Rosewood Ave (Ash/Willow)		460	16	5	95	1	0		0	0	0	0	2	1	0
Euclid Ave (Auburn/Willow)		1516	6	5	115	0	0		0	0	0	1	0	1	11
Crow Island (Willow)		289	6	5	60	0	1		0	0	0	1	1	1	1
Glendale (Willow/Mt Pleasant)		789	6	5	70	0	0	6	1	0	3	1	0	1	6
Rosewood Ave (Willow/Mt Pleasant)		685	6	5	80	0	0	6	0	0	1	1	0	1	15

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Mt Pleasant Rd (Crow Island/Locust)		1025	6	5	70	0	1	6	0	0	2	1	0	1	12
Mt Pleasant Rd (Locust/White Oak)		823	6	5	75	0	0	5	1	0	1	1	0	1	9
White Oak Ln (Willow/Sunset)		2143	6	5	80	0	0	5	0	0	2	1	0	1	17
Locust Rd (Willow/Hill)		3165	10	5	80	1	0	6	0	0	3	0	0	1	27
Sunset Rd (Crow Island/White Oak)		1868	6	5	70	0	1	6	0	1	6	1	0	1	23
Sunset Rd (White Oak/Birch)		1673	6	5	95	0	1	5	1	0	2	1	0	1	14
Sunset Rd (Birch/Ridge)		1324	6	5	95	0	0	5	0	0	1	1	0	1	8
De Windt Rd & Thorn Tree Ln (Sunset/Evergreen)		1501	6	5	100	0	0		0	0	0	1	0	1	9
Meadow Ln (end/Hill)		946	6	5	100	0	2		0	0	0	1	1	1	7
Higginson Ln (Sunset/Birch)		896	6	5	90	0	0	5	1	0	2	1	0	1	6
Alles Rd (Chestnut/Linden)		490	4	5	95	0	1	6	0	0	1	2	0	1	0
Lindenwood Dr (Hibbard/Apple Tree)		1061	6	5	60	0	0	6	1	3	4	1	0	1	17
Westview Rd (end/Hill)		776	6	5	90	0	1	5	0	0	3	1	0	1	10
Broadmeadow Rd (Westview/De Windt)		1891	6	5	85	0	1	6	1	0	1	1	0	1	18
Apple Tree Rd (Lindenwood/Hill)		1220	6	5	80	0	0	6	1	1	4	1	0	1	15
Hibbard Rd (Winnetka/Longmeadow)		2179	16	5	85	1	0		0	0	0	0	2	1	7
Hibbard Rd (Longmeadow/Illinois)		1238	16	5	115	1	0		0	0	0	0	2	1	0
Locust Rd (Indian Hill/Woodley)		607	6	5	50	0	0		0	0	0	1	0	1	2
Locust Rd (Hill/Indian Hill)		1497	6	5	90	0	0	6	1	1	3	1	0	1	9
Fox Ln (Locust/Hill)		1336	6	5	90	0	0		0	0	0	1	1	1	9
Hill Rd (Ridge/Church) - 8"		1383	8	5	120	0	0		0	0	0	0	0	1	7
Green Bay Rd & Church Rd (Willow/Garland)		1600	10	5	110	1	0		0	0	0	0	1	3	12
Church Rd (Garland/Winnetka)		1250	6	5	95	0	0	5	1	0	1	1	0	1	18
Sunset & Old Green Bay Rd (Church/Green Bay)		1264	6	5	90	0	2	1	0	0	1	1	0	1	15
Hill Ter & Old Green Bay Rd (Church/Winnetka)		797	4	5	115	0	1	5	0	0	1	2	0	2	12

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Winnetka Ave (Church/Brier)		732	6	5	95	0	0		0	0	0	1	0	3	13
Church Rd (Winnetka/Meadow)		459	6	5	90	0	0		0	0	0	1	0	1	5
High St (Winnetka/Meadow)		404	6	5	90	0	0	5	1	0	0	1	0	1	12
Brier St (Winnetka/Meadow)		390	6	5	115	0	0	4	0	0	1	1	0	3	7
Meadow Rd (Church/Brier)		849	6	5	105	0	1	5	0	0	1	1	0	1	20
Old Green Bay Rd (Winnetka/end)		2386	6	5	80	0	1	5	1	0	1	1	1	3	10
Hill Rd & Bertling Ln (Wilson/Winnetka)		1355	6	5	110	0	0		0	0	0	1	0	1	25
Winnetka Ave (Wilson/Warwick)		387	6	5	80	0	0		0	0	0	1	0	3	4
Warwick Rd & Abbotsford Rd & Essex Rd (Winnetka)		2234	4	5	115	0	0	5	1	0	2	2	0	1	35
Fuller Ln (Sheridan/Winnetka)		1608	6	5	110	0	0	6	0	0	1	1	0	1	34
Willow Rd (Rosewood/Birch)		1884	16	5	55	1	0	4	1	0	0	0	2	1	8
Willow Rd (Birch/Wilson)		2338	16	5	55	1	0		0	0	0	0	2	1	4
Maple St (Sheridan/Elm)		1794	10	5	115	1	0	4	0	0	1	0	1	1	22
Maple St (Elm/Willow)		1862	10	5	110	1	0		0	0	0	0	1	3	18
Wilson St (Willow/Orchard)		547	8	5	95	0	0	6	0	0	1	0	0	1	2
Lloyd Park (pump/Sheridan) - 20"		1379	20	5	115	1	0		0	0	0	0	3	1	1
Sheridan (Humboldt/Maple) - 20"		665	20	5	75	1	0		0	0	0	0	3	1	2
Maple St (Sheridan/Elm) - 20"		1832	20	5	120	1	0		0	0	0	0	3	1	0
Maple St (Elm/Willow) - 20"		1876	20	5	120	1	0		0	0	0	0	3	1	1
Sheridan Rd (Tower/Maple)		2230	12	5	100	1	0		0	0	0	0	1	1	26
Tower Rd (Prospect/pump) 20"		1509	20	5	60	1	0	3	1	0	0	0	3	1	5
Prospect Ave (Tower/Summit) - 20"		1134	20	5	115	1	0		0	0	0	0	3	1	6
Prospect Ave (Summit/Lincoln) - 20"		1300	20	5	70	1	0		0	0	0	0	3		7
Park Ln (Prospect/Sheridan) - 20"		755	20	5	70	1	0		0	0	0	0	3		2

Water Main Replacement Plan

Input Values

Winnetka, IL

Segment Name	Replacement Segments Parameters														
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I	Laterals
Lincoln Ave (Prospect/Green Bay) -20"		1322	20	5	90	1	0	5	1	0	0	0	3		5
Elm St (Birch/Green Bay) - 20"		852	20	5	100	1	0		0	0	0	0	3		6
Sheridan Rd (Maple/Elm)		2230	10	5	110	1	0	6	3	0	1	0	1	1	39
Private Drive (695 Sheridan)		757	6	5	70	0	0		0	0	0	0	1	1	4
Sheridan Rd (Elm/Willow)		2353	8	5	115	0	0		0	0	0	0	0	1	23
Walnut St (Sheridan/Oak)		940	6	5	75	0	0		0	0	0	1	0	1	5
Fairview Ave (Willow/Hawthorn)		684	8	5	115	0	0		0	0	0	0	0	1	12
Bell Ln (Tower/Tower)		2048	6	1	40	0	0	5	0	1	0	1	0	1	15
Hill Rd (Apple Tree/Thorn Tree)		1588	8	5	70	1	0		0	0	0	0	0	1	10

 : Main to be abandoned (2016)

1: Pipe Material: Ductile Iron(DI), PVC, Sandcast Iron(SCI), Cast Iron(CI)

2: Break Type: Hole, Vertical, Horizontal, Joint, Valve, Service

3: Critical: priority to moving water to users at high rates of flow & impact on community assets if break occurs

4: Capacity: Is there a need to increase/decrease main size based on projected demands

5: Distribution or transmission main

6: Types of customers - Residential, Commercial, Institutional

Pipe Size

4
6
8
10
12
16
20

Pipe Material

DI - 1
SCI - 2
HDPE-3
PVC - 4
CI - 5
Other - 6

Purpose

D - 0
T - 1

Break Type

H - 6
V - 5
HZ - 4
J - 3
Val - 2
S - 1

Risk Customer

Comm, Inst - 3
R multi (Rm) - 2
R single (Rs) - 1

EXHIBIT 2 - SEGMENT SUMMARY

Water Main Replacement Plan
Segment Summaries
Winnetka, IL

Segment Name	Replacement Segments Parameters														Total Parameter Value	
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers		
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶			
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I, H		Laterals
Whitebridge Hill Rd (Whitebridge/Sheridan)		1,661	6	6.5	7.8		4.2	6	5.1	0.8	4.2	2.4		1.2	5.2	49.4
Taylorport Ln (end/Sheridan)		385	6	6.5	15.0		2.8					1.2		1.2	1.04	33.7
Sheridan Rd (Scott/Sheridan)		1,707	6	6.5	15.0		1.4	6	0.8		4.9	1.2		1.2	3.38	46.4
Sheridan Rd (Sheridan/Private)		1,526	6	6.5	13.0		1.4	6	0.9	0.9	8.3	1.2		1.2	2.6	48.0
Sheridan Rd (Private/Tower)		985	6	6.5	15.0							1.2		1.2	1.3	31.2
Crescent Ln (end/Old Green Bay) - 4"		889	8	6.5	12.4		1.4					2.4		1.2	0.78	32.6
Crescent Ln (end/Fisher) - 6"		930	6	6.5	14.3		2.8					1.2		1.2	2.86	34.9
Fisher Ln (Old Green Bay/Sheridan)		1,176	6	6.5	13.7			6	2.4			1.2		1.2	2.86	39.8
Old Green Bay Rd (Fisher/Tower)		1,605	6	6.5	13.0			6	1.7		3.5	1.2		1.2	4.16	43.3
Hubbard Pl (end/Old Green Bay)		458	6	6.5	8.5		2.8					1.2		1.2	1.3	27.5
Ravine Rd (end/Sheridan)		828	6	6.5	8.5		2.8					1.2		1.2	2.34	28.5
Sheridan Rd (977 Sheridan Rd)		379	6	6.5	15.0		2.8					1.2		1.2	1.3	34.0
Glen Oak Rd (Sheridan/end)		447	6	6.5	6.5		2.8					1.2		1.2	1.3	25.5
Private Rd (Old Green Bay/951 Private)		815	6	6.5	11.7		1.4	5		1.4	1.4	1.2		1.2	1.3	37.1
Private Rd (951 Private/Sheridan)		1,351	8	6.5	11.7		1.4	5			2.1	2.4		1.2	1.56	39.8
Tower Manor Dr (end/Tower)		603	8	6.5	10.4		2.8					2.4		1.2	2.08	33.4
Lamson Dr (end/Tower)		526	6	6.5	15.0		2.8	5			1.4	1.2		1.2	2.08	41.1
Hill Rd (Westview/Apple Tree)		855	5.2	6.5	10.4			6	5.6	1.4				1.2	1.56	37.9
S. Indian Hill Rd (Woodley/Indian Hill)		1,490	6	6.5	13.0		1.4	5		0.9		1.2		1.2	1.82	37.1
S. Indian Hill Rd (Indian Hill/Indian Hill)		3,076	6	6.5	13.0		1.4	6	0.9	0.9	3.6	1.2		1.2	2.6	43.4
S. Indian Hill Rd (Indian Hill/Ridge) - North		1,024	6	6.5	15.0		1.4					1.2		1.2	2.08	33.3
S. Indian Hill Rd (Indian Hill/Ridge) - South		814	6	6.5	15.0		1.4	6		1.4	1.4	1.2		1.2	2.34	42.4
N. Indian Hill Rd (Woodley/Indian Hill)		2,483	6	6.5	15.0							1.2		1.2	5.72	35.6
N. Indian Hill Rd (Indian Hill/Indian Hill Club)		1,777	6	6.5	15.0							1.2		1.2	2.34	32.2
Indian Hill Rd (Indian Hill Club)		2,153	6	6.5	15.0		1.4	5	0.7			1.2		1.2	1.3	38.2
Indian Hill Rd & Golf Ln (Hill/Indian Hill)		1,822	6	6.5	11.7		2.8	6			3.8	1.2		1.2	2.6	41.8
Hill Rd (Locust/Ridge)		2,783	6	6.5	15.0			6	1.0	0.5	1.0	1.2		1.2	6.24	44.6
Hill Rd (Ridge/Church) - 4"		1,360	8	6.5	15.0			6	3.1		4.1	2.4		1.2	2.08	48.3
Forest St (Willow/Hill)		2,025	6	6.5	15.0			6	2.1		1.4	1.2	1.3	1.2	9.36	50.0
Elder Ln (Forest/Church)		818	6	6.5	13.0							1.2	1.3	1.2	3.12	32.3
Garland Ave (Forest/Church)		890	6	6.5	15.0			5			1.4	1.2		1.2	4.94	41.2

Water Main Replacement Plan
Segment Summaries
Winnetka, IL

Segment Name	Replacement Segments Parameters														Total Parameter Value	
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers		
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶			
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I, H		Laterals
Winnetka Ave (Warwick/Sheridan)		2,678	6	6.5	15.0		1.4	6	2.6	0.5	2.1	1.2		1.2	7.02	49.5
Hibbard Rd (Sunset/345 Hibbard/Auburn)		1,386	6	6.5	15.0			6	3.0	1.0	5.1	1.2		1.2	2.86	47.8
Willow Rd (Forestway/Hibbard)		1,454	7.8	6.5	15.0	1.4	1.4	6			3.9			1.2	0.26	43.4
Oak St (Chestnut/Green Bay)		286	8	6.5	13.0		4.2					2.4		3.6	1.82	36.8
		454	6	6.5	15.0		2.8					1.2		3.6		
Oak St (Locust/Birch)		1,336	8	6.5	15.6			6	6.3	3.1	6.3	2.4		1.2	4.94	60.4
Oak St (Hibbard/Glendale)		1,474	6	6.5	15.0			5	1.9		1.9	1.2	1.3	1.2	6.5	46.4
Oak St (Glendale/Birch)		1,469	5.2	6.5	15.0									1.2	15.6	43.5
Willow Rd (Rosewood/Chestnut)		1,725	6	6.5	14.3			5	2.4	0.8	2.4	1.2		1.2	5.98	45.9
Willow Rd (Chestnut/Green Bay)		1,648	6	6.5	15.0			5	1.7		0.8	1.2		1.2	1.04	38.4
Willow Rd (Hibbard/Locust)		2,582	6.5	6.5	15.0	1.4		6	1.6		1.1			1.2	10.66	49.9
Ash St (Hibbard/Glendale)		1,564	6	6.5	15.0							1.2		1.2	11.44	41.3
Ash St (Glendale/Birch)		2,535	8	6.5	15.0			6	0.6		1.7	2.4		1.2	19.5	60.8
Ash St (Birch/Green Bay)		1,679	8	6.5	15.0			5	2.5		2.5	2.4	1.3	1.2	6.24	50.6
Cherry St (Hibbard/Glendale)		1,542	6	6.5	15.0			6	0.9		1.8	1.2		1.2	12.74	51.3
Cherry St (Glendale/Birch)		2,511	8	6.5	15.0			4	1.7	1.1	0.6	2.4		1.2	20.02	60.4
Cherry St (Birch/Ridge)		1,304	8	6.5	15.0			6	1.1	1.1	3.2	2.4		1.2	8.84	53.3
Elm St (Locust/Provident)		570	8	6.5	15.6		1.4	6	4.2	1.4	8.4	2.4		1.2	3.12	58.2
Elm St (Provident/Green Bay)		1,628	6	6.5	15.6			6			1.7	1.2		3.6	8.58	49.2
Spruce St (Hibbard/Glendale)		1,478	6	6.5	15.0			6	0.9	0.9		1.2		1.2	5.46	43.2
Spruce St (Glendale/Locust)		1,154	8	6.5	15.6			5		1.2	1.2	2.4		1.2	10.14	51.3
Spruce St (Locust/Green Bay)		1,888	8	6.5	15.6			6	2.2		0.7	2.4		3.6	12.48	57.5
Pine St (Hibbard/Glendale)		1,447	6	6.5	15.0			6	1.0		1.0	1.2		1.2	4.42	42.2
Pine St (Glendale/Provident)		2,054	6	6.5	15.0			5	0.7			1.2		1.2	11.96	47.5
Pine St (Provident/Green Bay)		724	6	6.5	14.3			6	1.4		4.2	1.2		2.4	2.08	44.1
Glendale Ave (Oak/Willow)		1,317	6.5	6.5	15.0	1.4		6			2.1			1.2	0.26	38.9
Provident Ave (Pine/Elm)		941	6	6.5	15.0							1.2		1.2	5.2	35.1
Provident Ave (Elm/Willow)		1,854	6	6.5	15.0							1.2		1.2	11.44	41.3
Linden St (Elm/Willow)		1,475	6	6.5	15.0							1.2		3.6	8.32	40.6
Linden St (Sunset/Hill)		948	8	6.5	15.0			6		1.4	4.2	2.4	1.3	1.2	2.86	48.8
Linden St (Willow/Sunset)		1,333	6	6.5	15.0			5			2.1	1.2		1.2	6.5	43.5
Mt Pleasant St (Birch/Linden)		1,158	8	6.5	15.0		2.8	6	2.4		2.4	2.4		1.2	1.82	48.5
Plum Tree Ln (Hibbard/end)		550	6	6.5	7.8		4.2	6	1.4		2.8	1.2		1.2	0.78	37.9
Holly Ln (Hibbard/end)		531	6	6.5	15.0		4.2	5			1.4	1.2		1.2	0.78	41.2
Trapp Ln (Hibbard/end)		1,200	6	6.5	11.1		4.2	5		1.2	1.2	1.2		1.2	5.2	42.7
Westmoor Tr (Hibbard/end)		1,181	6	6.5	15.0		4.2	5		1.2	1.2	1.2		1.2	4.94	46.4
Hackberry Ln (Hibbard/end)		1,397	6	6.5	15.0		4.2	6	1.0		2.0	1.2		1.2	6.24	49.3
Sunview Ln (Hibbard/end)		1,173	6	6.5	9.1		4.2	6	1.2		3.6	1.2		1.2	7.02	46.0
Westmoor Rd & Laurel Ave (Hibbard/Ardsley)		2,598	6	6.5	15.0			6		0.5	3.2	1.2		1.2	6.5	46.1

Water Main Replacement Plan
Segment Summaries
Winnetka, IL

Segment Name	Replacement Segments Parameters														Total Parameter Value	
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers		
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶			
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I, H		Laterals
Westmoor Rd (Rosewood/Green Bay)		996	8	6.5	13.7			6	1.4			2.4		3.6	5.98	42.0
		369	6	6.5	12.4							1.2		1.2		
Rosewood Ave (Laurel/Westmoor)		1,019	6	6.5	15.0			6	1.4		2.7	1.2		1.2	4.94	44.9
Rosewood Ave (Westmoor/Pine)		1,342	6	6.5	13.0							1.2		1.2	1.82	29.7
Dinsmore Rd & Locust Rd & Starr Rd (Rosewood/Locust)		1,746	6	6.5	13.0		1.4	6	0.8		0.8	1.2		1.2	8.58	45.5
Locust St (Tower/Westmoor)		1,326	6	6.5	14.3			6		1.1	1.1	1.2		1.2	5.98	43.3
Vine St & Walden Rd (Locust/Westmoor)		1,066	6	6.5	15.0			5			1.3	1.2		1.2	5.2	41.4
Walden Rd (Westmoor/Pine)		1,672	5.2	6.5	13.7									1.2	6.76	33.3
Blackthorn Rd (Walden/Pine)		812	6	6.5	15.0							1.2		1.2	3.12	33.0
Kent Rd & Hamptondale Rd (Hibbard/Chatfield)		1,673	6	6.5	13.7			6		0.8	0.8	1.2		1.2	5.2	41.4
Chatfield Rd (Kent/Hamptondale)		1,322	6	6.5	13.7		1.4					1.2		1.2	5.46	35.4
Chatfield Rd (Hamptondale/Burr)		434	6	6.5	13.0			6	4.2			1.2		1.2	0.78	38.9
Chatfield Rd (Burr/Green Bay)		1,055	6	6.5	11.7			4		1.3		1.2		3.6	3.38	37.7
Gordon Ter & Merrill St & Gage St (Scott/Green Bay/Tower)		2,402	6	6.5	15.0			6	2.9	1.2	0.6	1.2	1.3	3.6	7.02	51.2
N/S Forest Glen Dr		1,621	6	6.5	15.0		1.4	6	0.9	1.7	3.5	1.2		1.2	8.32	51.6
Edgewood Ln (Grove/end)		1,691	6	6.5	15.0		1.4	5			0.8	1.2		1.2	15.6	52.7
Scott Ave (Grove/Greenwood)		616	6	6.5	13.0			5	1.4			1.2		1.2	5.2	39.5
Scott Ave (Greenwood/Lake)		1,985	8	6.5	14.3			5			1.4	2.4		1.2	13.26	52.1
Scott Ave (Lake/Green Bay)		1,617	6	6.5	14.3							1.2		3.6	4.94	36.5
Woodley Rd (Southeast) - 4"		1,865	8	6.5	15.0		4.2	5	0.8			2.4	1.3	1.2	3.64	47.9
Woodley Rd (Southeast) - 6"		1,016	6	6.5	10.4		4.2	6	1.4	1.4	2.8	1.2	1.3	1.2	1.82	44.1
Woodley Rd (Hibbard/110 Woodley)		2,151	6	6.5	9.8		2.8					1.2	1.3	1.2	3.12	31.9
Woodley Rd (110 Woodley/75 Woodley Rd)		1,283	6	6.5	8.5		2.8	5		1.1	1.1	2.4	1.3	1.2	1.56	37.4
Woodley Rd (81 Woodley Rd/Locust)		2,334	6	6.5	7.2		4.2					1.2	1.3	1.2	5.46	33.0
Woodley Rd (Hill/45 Woodley)		791	6	6.5	15.0		1.4					1.2		1.2	1.56	32.8
Woodley Rd (45 Woodley/70 Woodley)		1,516	6	6.5	9.8		1.4					1.2		1.2	2.08	28.1
Woodley Rd (70 Woodley/96 Woodley)		1,789	6	6.5	10.4		1.4					1.2		1.2	4.42	31.1
Woodley Rd (52 Woodley/Locust)		2,709	6	6.5	13.0		2.8	6		0.5		1.2	1.3	1.2	3.64	42.2
Woodley Rd (45 Woodley/10 Woodley)		1,993	6	6.5	10.4		2.8					1.2	1.3	1.2	2.6	32.0

Water Main Replacement Plan
Segment Summaries
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Segment Name	Replacement Segments Parameters														Total Parameter Value	
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers		
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶			
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I, H		Laterals
Woodley Rd (5 Woodley/Locust)		1,292	6	6.5	13.0		1.4					1.2		1.2	2.86	32.2
Longmeadow Rd (Longmeadow/Hibbard)		952	5.2	6.5	9.8									1.2	2.6	25.3
Longmeadow Rd - loop (Longmeadow)		2,823	6	6.5	8.5		2.8	5	0.5		2.0	1.2		1.2	6.76	40.4
Longmeadow Rd - backyard (Longmeadow/Hibbard)		1,708	6	6.5	9.8		2.8	6			1.6	1.2	1.3	1.2	1.82	38.2
Green Bay Rd (Tower/Westmoor)		1,422	5.2	6.5	15.0			6			1.0		1.3	3.6	5.98	44.5
Green Bay Rd (Westmoor/Pine)		1,691	5.2	6.5	14.3			6			1.7		1.3	3.6	5.98	44.5
Green Bay Rd (Pine/Elm)		1,096	5.2	6.5	15.6			5	2.6				1.3	3.6	1.82	41.6
Tower Rd (Green Bay/Sheridan) 1		2,496	7.8	6.5	12.4	1.4		6	0.6			1.2	2.6	3.6	2.86	44.9
Tower Rd (Green Bay/Sheridan) 2		2,836	7.8	6.5	12.4	1.4		4	0.5			1.2	2.6	3.6	3.12	43.1
Foxdale (Tower/Humboldt)		2,560	8	6.5	15.0		1.4	6		0.5	1.1	2.4		1.2	20.02	62.1
Lincoln Ave (Tower/Humboldt)		2,048	6	6.5	15.6			6			0.7	1.2		1.2	11.7	48.9
Prospect Ave (Tower/Humboldt)		1,548	8	6.5	15.0			3			0.9	2.4		1.2	5.72	42.7
Summit St (Foxdale/Prospect)		736	6	6.5	14.3							1.2		1.2	0.26	29.5
Humboldt Ave (Foxdale/Prospect)		1,118	8	6.5	13.0		2.8					2.4		1.2	2.34	36.2
Bryant Ave (Tower/Prospect)		2,102	8	6.5	15.0			6	0.7		0.7	2.4	1.3	1.2	6.5	48.2
Prospect Ave (Humboldt/Lincoln)		1,468	8	6.5	15.6			5		1.0	1.9	2.4		1.2	1.04	42.6
Lincoln Ave (Humboldt/Elm)		1,872	6	6.5	15.0							1.2		1.2	10.14	40.0
Pine St (Killian/Lincoln)		538	8	6.5	13.0							2.4		1.2	1.56	32.7
Arbor Vitae Rd (Pine/Elm)		785	6	6.5	15.0		4.2					1.2		1.2	4.68	38.7
Elm St (Lincoln/Maple)		863	6	6.5	15.0			5		1.4		1.2		3.6	3.64	42.3
Elm St (Maple/Sheridan)		1,270	8	6.5	15.6			6	2.2		6.6	2.4		1.2	5.2	53.7
Spruce St (Maple/Sheridan)		932	8	6.5	15.0							2.4		1.2	4.68	37.7
Hoyt Ln (Sheridan/Sheridan)		1,511	6	6.5	15.0			6		0.9	3.7	1.2		1.2	4.42	44.9
Oak St (Maple/Sheridan)		1,698	8	6.5	15.6			6		0.8	1.6	2.4		1.2	6.76	48.9
Cherry St (Maple/Sheridan)		2,262	8	6.5	15.6			6	0.6		1.9	2.4		1.2	13.78	56.0
Ash St (Maple/Sheridan)		2,764	8	6.5	15.0			6	1.0		0.5	2.4		1.2	11.96	52.5
Willow (Maple/Sheridan)		2,863	6	6.5	15.0		1.4					1.2		1.2	14.82	46.1
Poplar St (Willow/Orchard)		395	6	6.5	14.3							1.2		1.2	0.78	30.0
Walnut (Orchard/Hawthorn)		389	6	6.5	13.7			5			2.8	1.2		1.2	1.56	37.9
Poplar St (Hawthorn/Sunset)		858	6	6.5	13.7		1.4	6	1.4	1.4		1.2		1.2	1.56	40.3
Myrtle St (Sunset/Hill)		384	6	6.5	15.0							1.2		1.2	1.3	31.2
Woodland Ave (Willow/Elder)		1,109	6	6.5	15.0			4		1.3		1.2		1.2	3.38	38.5
Woodland Ave (Elder/Winnetka)		1,534	6	6.5	13.7			5	0.9		0.9	1.2		1.2	4.94	40.3
Essex Rd (Elder/Winnetka)		1,671	6	6.5	13.0							1.2		1.2	1.56	29.5
Orchard Ln (Wilson/Fairview)		1,618	8	6.5	15.0							2.4		1.2	9.88	42.9

Water Main Replacement Plan
Segment Summaries
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Segment Name	Replacement Segments Parameters														Total Parameter Value	
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers		
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶			
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I, H		Laterals
Hawthorn Ln (Walnut/Fairview)		1,327	6	6.5	15.0			5			1.1	1.2		1.2	9.36	45.3
Hawthorn Ln (Fairview/Sheridan)		1,158	8	6.5	13.7							2.4	1.3	1.2	4.94	38.0
Elder Ln (Wilson/Woodland)		1,525	6	6.5	15.0			6	0.9		1.8	1.2		1.2	9.36	48.0
Elder Ln (Woodland/Sheridan)		1,030	6	6.5	14.3			4	1.4		1.4	1.2		1.2	5.46	41.4
Private drive (Sheridan)		353	8	6.5	11.7							2.4		1.2	1.56	31.4
Sunset Rd (Poplar/Essex)		2,224	6	6.5	15.0		1.4	6		1.3	1.3	1.2		1.2	13	52.8
Sheridan Rd (Willow/Elder)		1,151	6	6.5	15.0							1.2		1.2	3.12	33.0
Sheridan Rd (Elder/Winnetka)		2,210	6	6.5	15.0			6			3.8	1.2		1.2	7.8	47.5
Heather Ln & Hickory Ln & Hazel Ln & Sumac Ln (Tower/Hazel)		2,784	6	6.5	9.8							1.2		1.2	7.8	32.5
Boal Pky (Tower/Sumac)		1,691	6	6.5	9.8		1.4	6	0.8		6.6	1.2	1.3	1.2	4.42	45.2
Pine Tree Ln (end/Tower)		1,485	6	6.5	10.4		1.4	6			2.8	1.2		1.2	6.24	41.8
Asbury Ave (Pine Tree/Grove)		1,307	6	6.5	9.1		1.4					1.2		1.2	4.68	30.1
Grove St (Scott/Edgewood)		785	6	6.5	9.8			6			2.8	1.2		1.2	1.82	35.3
Tower Rd (Pine Tree/Bell)		985	6	6.5	11.7							1.2		1.2	13.26	29.3
		1,764	6.5	6.5	7.8	1.4								1.2		
Grove St & Asbury Ave (Tower/Randolph)		2,846	6.5	6.5	15.0	1.4								1.2	8.58	39.1
Asbury Ave (Grove/Lake)		2,792	8	6.5	14.3			6	1.5	0.5		2.4		1.2	17.68	58.1
Asbury Ave (Lake/Gordon)		1,397	6	6.5	15.0							1.2		1.2	9.62	39.5
Euclid Ave & Oakley Ave (Asbury/Gordon)		1,198	6	6.5	15.0							1.2		1.2	4.68	34.5
Green Bay Rd (Scott/Tower) - 10"		1,573	6.5	6.5	15.0	1.4								3.6	6.24	39.2
Green Bay Rd (Scott/Tower) - 12"		1,746	7.8	6.5	13.0	1.4							1.3	3.6	2.6	36.2
Tower Rd (Gordon/Green Bay)		1,351	6.5	6.5	13.0	1.4								3.6	4.68	35.7
Hibbard Rd (Tower/Westmoor)		1,304	6.5	6.5	11.7									1.2	2.08	28.0
Hibbard Rd (Sunview Spruce)		838	6.5	6.5	7.8	1.4		6			2.8			1.2	0.52	32.7
Winnetka Golf Club		2,537	6	6.5	6.5		4.2	6		0.6		1.2		3.6	0.78	35.3
Ardsley Rd (Tower/Westmoor)		1,617	6.5	6.5	13.0	1.4		6			0.9			1.2	3.64	39.1
Ardsley Rd (Westmoor/Pine)		1,470	6.5	6.5	11.7	1.4								1.2	3.9	31.2
Burr Ave (Laurel/Westmoor)		551	8	6.5	13.7			6	1.4		1.4	2.4		1.2	1.3	41.9
Pelham Rd (Pine/Rosewood)		1,513	6	6.5	11.1							1.2		1.2	2.6	28.6
Elm St (Hibbard/Glendale) - 12"		1,510	7.8	6.5	7.8	1.4		6	0.9		1.9		1.3	1.2		34.8
Elm St (Hibbard/Glendale) - 6"		1,506	6	6.5	11.7			6	2.8	1.9	1.9	1.2	1.3	1.2	3.38	43.8
Locust St (Spruce/Elm)		483	5.2	6.5	9.8									1.2	0.78	23.4
Elm St (Glendale/Locust)		1,155	10.4	6.5	7.8	1.4							2.6	1.2	9.62	39.5
Elm St (Locust/Birch)		1,310	10.4	6.5	11.7	1.4		4			1.1		2.6	1.2	0.78	39.6
Birch St (Elm/Oak)		443	7.8	6.5	13.0	1.4							1.3	1.2	0.26	31.5

Water Main Replacement Plan
Segment Summaries
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		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶			
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I, H		Laterals
Birch St (Cherry/Willow)		879	7.8	6.5	15.0	1.4							1.3	1.2	1.3	34.5
Birch St (Willow/Hill)		2,134	6	6.5	12.4			6	1.3		3.3	1.2		1.2	1.56	39.4
Chestnut St (Willow/Hill)		2,538	6	6.5	15.0			6	0.6		1.7	1.2		1.2	8.06	46.1
Ridge Ave (Cherry/Hill) - 4"		1,996	8	6.5	15.0			5		0.7	0.7	2.4		1.2	6.76	46.2
Ridge Ave (Cherry/Hill) - 10"		1,986	6.5	6.5	15.0	1.4								1.2	4.68	35.2
Hibbard Rd (Ash/Willow)		409	10.4	6.5	12.4	1.4							2.6	1.2		34.5
Ash St (Hibbard/Glendale) - 16"		2,137	10.4	6.5	12.4	1.4							2.6	1.2	1.3	35.8
Rosewood Ave (Ash/Willow)		460	10.4	6.5	12.4	1.4							2.6	1.2		34.5
Euclid Ave (Auburn/Willow)		1,516	6	6.5	15.0							1.2		1.2	2.86	32.7
Crow Island (Willow)		289	6	6.5	7.8		1.4					1.2	1.3	1.2	0.26	25.7
Glendale (Willow/Mt Pleasant)		789	6	6.5	9.1			6	1.4		4.2	1.2		1.2	1.56	37.2
Rosewood Ave (Willow/Mt Pleasant)		685	6	6.5	10.4			6			1.4	1.2		1.2	3.9	36.6
Mt Pleasant Rd (Crow Island/Locust)		1,025	6	6.5	9.1		1.4	6			2.7	1.2		1.2	3.12	37.3
Mt Pleasant Rd (Locust/White Oak)		823	6	6.5	9.8			5	1.4		1.4	1.2		1.2	2.34	34.8
White Oak Ln (Willow/Sunset)		2,143	6	6.5	10.4			5			1.3	1.2		1.2	4.42	36.0
Locust Rd (Willow/Hill)		3,165	6.5	6.5	10.4	1.4		6			1.3			1.2	7.02	40.3
Sunset Rd (Crow Island/White Oak)		1,868	6	6.5	9.1		1.4	6		0.7	4.5	1.2		1.2	5.98	42.6
Sunset Rd (White Oak/Birch)		1,673	6	6.5	12.4		1.4	5	0.8		1.7	1.2		1.2	3.64	39.8
Sunset Rd (Birch/Ridge)		1,324	6	6.5	12.4			5			1.1	1.2		1.2	2.08	35.4
De Windt Rd & Thorn Tree Ln (Sunset/Evergreen)		1,501	6	6.5	13.0							1.2		1.2	2.34	30.2
Meadow Ln (end/Hill)		946	6	6.5	13.0		2.8					1.2	1.3	1.2	1.82	33.8
Higginson Ln (Sunset/Birch)		896	6	6.5	11.7			5	1.4		2.8	1.2		1.2	1.56	37.4
Alles Rd (Chestnut/Linden)		490	8	6.5	12.4		1.4	6			1.4	2.4		1.2		39.3
Lindenwood Dr (Hibbard/Apple Tree)		1,061	6	6.5	7.8			6	1.3	4.0	5.3	1.2		1.2	4.42	43.7
Westview Rd (end/Hill)		776	6	6.5	11.7		1.4	5			4.2	1.2		1.2	2.6	39.8
Broadmeadow Rd (Westview/De Windt)		1,891	6	6.5	11.1		1.4	6	0.7		0.7	1.2		1.2	4.68	39.5
Apple Tree Rd (Lindenwood/Hill)		1,220	6	6.5	10.4			6	1.1	1.1	4.6	1.2		1.2	3.9	42.1
Hibbard Rd (Winnetka/Longmeadow)		2,179	10.4	6.5	11.1	1.4							2.6	1.2	1.82	35.0
Hibbard Rd (Longmeadow/Illinois)		1,238	10.4	6.5	15.0	1.4							2.6	1.2		37.1
Locust Rd (Indian Hill/Woodley)		607	6	6.5	6.5							1.2		1.2	0.52	21.9
Locust Rd (Hill/Indian Hill)		1,497	6	6.5	11.7			6	0.9	0.9	2.8	1.2		1.2	2.34	39.6
Fox Ln (Locust/Hill)		1,336	6	6.5	11.7							1.2	1.3	1.2	2.34	30.2
Hill Rd (Ridge/Church) - 8"		1,383	5.2	6.5	15.6									1.2	1.82	30.3
Green Bay Rd & Church Rd (Willow/Garland)		1,600	6.5	6.5	14.3	1.4							1.3	3.6	3.12	36.7
Church Rd (Garland/Winnetka)		1,250	6	6.5	12.4			5	1.1		1.1	1.2		1.2	4.68	39.2
Sunset & Old Green Bay Rd (Church/Green Bay)		1,264	6	6.5	11.7		2.8	1			1.1	1.2		1.2	3.9	35.4

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		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶			
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Hill Ter & Old Green Bay Rd (Church/Winnetka)		797	8	6.5	15.0		1.4	5			1.4	2.4		2.4	3.12	45.2
Winnetka Ave (Church/Brier)		732	6	6.5	12.4							1.2		3.6	3.38	33.0
Church Rd (Winnetka/Meadow)		459	6	6.5	11.7							1.2		1.2	1.3	27.9
High St (Winnetka/Meadow)		404	6	6.5	11.7			5	1.4			1.2		1.2	3.12	36.1
Brier St (Winnetka/Meadow)		390	6	6.5	15.0			4			1.4	1.2		3.6	1.82	39.5
Meadow Rd (Church/Brier)		849	6	6.5	13.7		1.4	5			1.4	1.2		1.2	5.2	41.6
Old Green Bay Rd (Winnetka/end)		2,386	6	6.5	10.4		1.4	5	0.6		0.6	1.2	1.3	3.6	2.6	39.2
Hill Rd & Bertling Ln (Wilson/Winnetka)		1,355	6	6.5	14.3							1.2		1.2	6.5	35.7
Winnetka Ave (Wilson/Warwick)		387	6	6.5	10.4							1.2		3.6	1.04	28.7
Warwick Rd & Abbotsford Rd & Essex Rd (Winnetka)		2,234	8	6.5	15.0			5	0.6		1.3	2.4		1.2	9.1	49.0
Fuller Ln (Sheridan/Winnetka)		1,608	6	6.5	14.3			6			0.9	1.2		1.2	8.84	44.9
Willow Rd (Rosewood/Birch)		1,884	10.4	6.5	7.2	1.4		4	0.7				2.6	1.2	2.08	36.1
Willow Rd (Birch/Wilson)		2,338	10.4	6.5	7.2	1.4							2.6	1.2	1.04	30.3
Maple St (Sheridan/Elm)		1,794	6.5	6.5	15.0	1.4		4			0.8		1.3	1.2	5.72	42.4
Maple St (Elm/Willow)		1,862	6.5	6.5	14.3	1.4							1.3	3.6	4.68	38.3
Wilson St (Willow/Orchard)		547	5.2	6.5	12.4			6			1.4			1.2	0.52	33.2
Lloyd Park (pump/Sheridan) - 20"		1,379	13	6.5	15.0	1.4							3.9	1.2	0.26	41.2
Sheridan (Humboldt/Maple) - 20"		665	13	6.5	9.8	1.4							3.9	1.2	0.52	36.3
Maple St (Sheridan/Elm) - 20"		1,832	13	6.5	15.6	1.4							3.9	1.2		41.6
Maple St (Elm/Willow) - 20"		1,876	13	6.5	15.6	1.4							3.9	1.2	0.26	41.9
Sheridan Rd (Tower/Maple)		2,230	7.8	6.5	13.0	1.4							1.3	1.2	6.76	38.0
Tower Rd (Prospect/pump) - 20"		1,509	13	6.5	7.8	1.4		3	0.9				3.9	1.2	1.3	39.0
Prospect Ave (Tower/Summit) - 20"		1,134	13	6.5	15.0	1.4							3.9	1.2	1.56	42.5
Prospect Ave (Summit/Lincoln) - 20"		1,300	13	6.5	9.1	1.4							3.9		1.82	35.7
Park Ln (Prospect/Sheridan) - 20"		755	13	6.5	9.1	1.4							3.9		0.52	34.4
Lincoln Ave (Prospect/Green Bay) -20"		1,322	13	6.5	11.7	1.4		5	1.1				3.9		1.3	43.9
Elm St (Birch/Green Bay) - 20"		852	13	6.5	13.0	1.4							3.9		1.56	39.4
Sheridan Rd (Maple/Elm)		2,230	6.5	6.5	14.3	1.4		6	1.9		0.6		1.3	1.2	10.14	49.9
Private Drive (695 Sheridan)		757	6	6.5	9.1								1.3	1.2	1.04	25.1
Sheridan Rd (Elm/Willow)		2,353	5.2	6.5	15.0									1.2	5.98	33.8
Walnut St (Sheridan/Oak)		940	6	6.5	9.8							1.2		1.2	1.3	26.0
Fairview Ave (Willow/Hawthorn)		684	5.2	6.5	15.0									1.2	3.12	31.0
Bell Ln (Tower/Tower)		2,048	6	1.3	5.2			5		0.7		1.2		1.2	3.9	24.5

Water Main Replacement Plan
Segment Summaries
Winnetka, IL

Segment Name	Replacement Segments Parameters														Total Parameter Value
	Parameter	Length	Water Main Size - ID inches	Pipe Material ¹	Age	Purpose ⁵	System Continuity	Break History			Capacity ⁴	Risk		Number of Customers	
		Ft.						Type ²	No. of Breaks			Critical ³	Customers ⁶		
	Parameter Value		4,6,8,12,16,20,24	DI, PVC, HDPE, SCI, CI	years	D or T	0 to 3	H,V, HZ, J, V, S	# last 5 years	# last 10 years	> 10 years or unknown	0 to 2	0 to 3	Rm, Rs,C, I, H	
Hill Rd (Apple Tree/Thorn Tree)		1,588	5.2	6.5	9.1	1.4							1.2	2.6	26.0

: Main to be abandoned (2016)

1: Pipe Material: Ductile Iron(DI), PVC, Sandcast Iron(SCI), Cast Iron(CI)

2: Break Type: Hole, Vertical, Horizontal, Joint, Valve, Service

3: Critical: priority to moving water to users at high rates of flow & impact on community assets if break occurs

4: Capacity: Is there a need to increase/decrease main size based on projected demands

5: Distribution or transmission main

6: Types of customers - Residential, Commercial, Institutional

Pipe Size

4
6
8
10
12
16
20

Pipe Material

DI - 1
SCI - 2
HDPE-3
PVC - 4
CI - 5
Other - 6

Purpose

D - 0
T - 1

Break Type

H - 6
V - 5
HZ - 4
J - 3
Val - 2
S - 1

Risk Customer

Comm, Inst - 3
R multi (Rm) - 2
R single (Rs) - 1

Water Main Replacement Plan
Segments Ranked by Total Parameter Value
Winnetka, IL

Rank	Segment	Total Parameter Value
1	Foxdale (Tower/Humboldt)	62.1
2	Ash St (Glendale/Birch)	60.8
3	Cherry St (Glendale/Birch)	60.4
4	Oak St (Locust/Birch)	60.4
5	Elm St (Locust/Provident)	58.2
6	Asbury Ave (Grove/Lake)	58.1
7	Spruce St (Locust/Green Bay)	57.5
8	Cherry St (Maple/Sheridan)	56.0
9	Elm St (Maple/Sheridan)	53.7
10	Cherry St (Birch/Ridge)	53.3
11	Sunset Rd (Poplar/Essex)	52.8
12	Edgewood Ln (Grove/end)	52.7
13	Ash St (Maple/Sheridan)	52.5
14	Scott Ave (Greenwood/Lake)	52.1
15	N/S Forest Glen Dr	51.6
16	Cherry St (Hibbard/Glendale)	51.3
17	Spruce St (Glendale/Locust)	51.3
18	Gordon Ter & Merrill St & Gage St (Scott/Green Bay/Tower)	51.2
19	Ash St (Birch/Green Bay)	50.6
20	Forest St (Willow/Hill)	50.0
21	Willow Rd (Hibbard/Locust)	49.9
22	Sheridan Rd (Maple/Elm)	49.9
23	Winnetka Ave (Warwick/Sheridan)	49.5
24	Whitebridge Hill Rd (Whitebridge/Sheridan)	49.4
25	Hackberry Ln (Hibbard/end)	49.3
26	Elm St (Provident/Green Bay)	49.2
27	Warwick Rd & Abbotsford Rd & Essex Rd (Winnetka)	49.0
28	Oak St (Maple/Sheridan)	48.9
29	Lincoln Ave (Tower/Humboldt)	48.9
30	Linden St (Sunset/Hill)	48.8
31	Mt Pleasant St (Birch/Linden)	48.5
32	Hill Rd (Ridge/Church) - 4"	48.3
33	Bryant Ave (Tower/Prospect)	48.2
34	Sheridan Rd (Sheridan/Private)	48.0
35	Elder Ln (Wilson/Woodland)	48.0
36	Woodley Rd (Southeast) - 4"	47.9
37	Hibbard Rd (Sunset/345 Hibbard/Auburn)	47.8
38	Pine St (Glendale/Provident)	47.5
39	Sheridan Rd (Elder/Winnetka)	47.5
40	Oak St (Hibbard/Glendale)	46.4
41	Sheridan Rd (Scott/Sheridan)	46.4
42	Westmoor Tr (Hibbard/end)	46.4
43	Ridge Ave (Cherry/Hill) - 4"	46.2
44	Westmoor Rd & Laurel Ave (Hibbard/Ardsley)	46.1
45	Chestnut St (Willow/Hill)	46.1
46	Willow (Maple/Sheridan)	46.1
47	Sunview Ln (Hibbard/end)	46.0
48	Willow Rd (Rosewood/Chestnut)	45.9
49	Dinsmore Rd & Locust Rd & Starr Rd (Rosewood/Locust)	45.5
50	Hawthorn Ln (Walnut/Fairview)	45.3
51	Boal Pky (Tower/Sumac)	45.2
52	Hill Ter & Old Green Bay Rd (Church/Winnetka)	45.2
53	Rosewood Ave (Laurel/Westmoor)	44.9
54	Fuller Ln (Sheridan/Winnetka)	44.9
55	Hoyt Ln (Sheridan/Sheridan)	44.9
56	Tower Rd (Green Bay/Sheridan) 1	44.9
57	Hill Rd (Locust/Ridge)	44.6

Water Main Replacement Plan
 Segments Ranked by Total Parameter Value
 Winnetka, IL

Rank	Segment	Total Parameter Value
58	Green Bay Rd (Westmoor/Pine)	44.5
59	Green Bay Rd (Tower/Westmoor)	44.5
60	Woodley Rd (Southeast) - 6"	44.1
61	Pine St (Provident/Green Bay)	44.1
62	Lincoln Ave (Prospect/Green Bay) -20"	43.9
63	Elm St (Hibbard/Glendale) - 6"	43.8
64	Lindenwood Dr (Hibbard/Apple Tree)	43.7
65	Linden St (Willow/Sunset)	43.5
66	Oak St (Glendale/Birch)	43.5
67	S. Indian Hill Rd (Indian Hill/Indian Hill)	43.4
68	Willow Rd (Forestway/Hibbard)	43.4
69	Old Green Bay Rd (Fisher/Tower)	43.3
70	Locust St (Tower/Westmoor)	43.3
71	Spruce St (Hibbard/Glendale)	43.2
72	Tower Rd (Green Bay/Sheridan) 2	43.1
73	Orchard Ln (Wilson/Fairview)	42.9
74	Trapp Ln (Hibbard/end)	42.7
75	Prospect Ave (Tower/Humboldt)	42.7
76	Sunset Rd (Crow Island/White Oak)	42.6
77	Prospect Ave (Humboldt/Lincoln)	42.6
78	Prospect Ave (Tower/Summit) - 20"	42.5
79	S. Indian Hill Rd (Indian Hill/Ridge) - South	42.4
80	Maple St (Sheridan/Elm)	42.4
81	Elm St (Lincoln/Maple)	42.3
82	Pine St (Hibbard/Glendale)	42.2
83	Woodley Rd (52 Woodley/ Locust)	42.2
84	Apple Tree Rd (Lindenwood/Hill)	42.1
85	Westmoor Rd (Rosewood/Green Bay)	42.0
86	Maple St (Elm/Willow) - 20"	41.9
87	Burr Ave (Laurel/Westmoor)	41.9
88	Indian Hill Rd & Golf Ln (Hill/Indian Hill)	41.8
89	Pine Tree Ln (end/Tower)	41.8
90	Maple St (Sheridan/Elm) - 20"	41.6
91	Green Bay Rd (Pine/Elm)	41.6
92	Meadow Rd (Church/Brier)	41.6
93	Kent Rd & Hamptondale Rd (Hibbard/Chatfield)	41.4
94	Elder Ln (Woodland/Sheridan)	41.4
95	Vine St & Walden Rd (Locust/Westmoor)	41.4
96	Ash St (Hibbard/Glendale)	41.3
97	Provident Ave (Elm/Willow)	41.3
98	Holly Ln (Hibbard/end)	41.2
99	Lloyd Park (pump/Sheridan) - 20"	41.2
100	Garland Ave (Forest/Church)	41.2
101	Lamson Dr (end/Tower)	41.1
102	Linden St (Elm/Willow)	40.6
103	Longmeadow Rd - loop (Longmeadow)	40.4
104	Locust Rd (Willow/Hill)	40.3
105	Woodland Ave (Elder/Winnetka)	40.3
106	Poplar St (Hawthorn/Sunset)	40.3
107	Lincoln Ave (Humboldt/Elm)	40.0
108	Private Rd (951 Private/Sheridan)	39.8
109	Sunset Rd (White Oak/Birch)	39.8
110	Westview Rd (end/Hill)	39.8
111	Fisher Ln (Old Green Bay/Sheridan)	39.8
112	Elm St (Locust/Birch)	39.6
113	Locust Rd (Hill/Indian Hill)	39.6
114	Elm St (Glendale/Locust)	39.5

Water Main Replacement Plan
Segments Ranked by Total Parameter Value
Winnetka, IL

Rank	Segment	Total Parameter Value
115	Broadmeadow Rd (Westview/De Windt)	39.5
116	Scott Ave (Grove/Greenwood)	39.5
117	Brier St (Winnetka/Meadow)	39.5
118	Asbury Ave (Lake/Gordon)	39.5
119	Birch St (Willow/Hill)	39.4
120	Elm St (Birch/Green Bay) - 20"	39.4
121	Alles Rd (Chestnut/Linden)	39.3
122	Green Bay Rd (Scott/Tower) - 10"	39.2
123	Old Green Bay Rd (Winnetka/end)	39.2
124	Church Rd (Garland/Winnetka)	39.2
125	Grove St & Asbury Ave (Tower/Randolph)	39.1
126	Ardsley Rd (Tower/Westmoor)	39.1
127	Tower Rd (Prospect/pump) - 20"	39.0
128	Glendale Ave (Oak/Willow)	38.9
129	Chatfield Rd (Hamptondale/Burr)	38.9
130	Arbor Vitae Rd (Pine/Elm)	38.7
131	Woodland Ave (Willow/Elder)	38.5
132	Willow Rd (Chestnut/Green Bay)	38.4
133	Maple St (Elm/Willow)	38.3
134	Longmeadow Rd - backyard (Longmeadow/Hibbard)	38.2
135	Indian Hill Rd (Indian Hill Club)	38.2
136	Hawthorn Ln (Fairview/Sheridan)	38.0
137	Sheridan Rd (Tower/Maple)	38.0
138	Walnut (Orchard/Hawthorn)	37.9
139	Plum Tree Ln (Hibbard/end)	37.9
140	Hill Rd (Westview/Apple Tree)	37.9
141	Spruce St (Maple/Sheridan)	37.7
142	Chatfield Rd (Burr/Green Bay)	37.7
143	Woodley Rd (110 Woodley/75 Woodley Rd)	37.4
144	Higginson Ln (Sunset/Birch)	37.4
145	Mt Pleasant Rd (Crow Island/Locust)	37.3
146	Glendale (Willow/Mt Pleasant)	37.2
147	Private Rd (Old Green Bay/951 Private)	37.1
148	S. Indian Hill Rd (Woodley/Indian Hill)	37.1
149	Hibbard Rd (Longmeadow/Illinois)	37.1
150	Oak St (Chestnut/Green Bay)	36.8
151	Green Bay Rd & Church Rd (Willow/Garland)	36.7
152	Rosewood Ave (Willow/Mt Pleasant)	36.6
153	Scott Ave (Lake/Green Bay)	36.5
154	Sheridan (Humboldt/Maple) - 20"	36.3
155	Humboldt Ave (Foxdale/Prospect)	36.2
156	Green Bay Rd (Scott/Tower) - 12"	36.2
157	High St (Winnetka/Meadow)	36.1
158	Willow Rd (Rosewood/Birch)	36.1
159	White Oak Ln (Willow/Sunset)	36.0
160	Ash St (Hibbard/Glendale) - 16"	35.8
161	Prospect Ave (Summit/Lincoln) - 20"	35.7
162	Hill Rd & Bertling Ln (Wilson/Winnetka)	35.7
163	Tower Rd (Gordon/Green Bay)	35.7
164	N. Indian Hill Rd (Woodley/Indian Hill)	35.6
165	Chatfield Rd (Kent/Hamptondale)	35.4
166	Sunset & Old Green Bay Rd (Church/Green Bay)	35.4
167	Sunset Rd (Birch/Ridge)	35.4
168	Winnetka Golf Club	35.3
169	Grove St (Scott/Edgewood)	35.3
170	Ridge Ave (Cherry/Hill) - 10"	35.2
171	Provident Ave (Pine/Elm)	35.1

Water Main Replacement Plan
Segments Ranked by Total Parameter Value
Winnetka, IL

Rank	Segment	Total Parameter Value
172	Hibbard Rd (Winnetka/Longmeadow)	35.0
173	Crescent Ln (end/Fisher) - 6"	34.9
174	Mt Pleasant Rd (Locust/White Oak)	34.8
175	Elm St (Hibbard/Glendale) -12"	34.8
176	Euclid Ave & Oakley Ave (Asbury/Gordon)	34.5
177	Hibbard Rd (Ash/Willow)	34.5
178	Rosewood Ave (Ash/Willow)	34.5
179	Birch St (Cherry/Willow)	34.5
180	Park Ln (Prospect/Sheridan) - 20"	34.4
181	Sheridan Rd (977 Sheridan Rd)	34.0
182	Sheridan Rd (Elm/Willow)	33.8
183	Meadow Ln (end/Hill)	33.8
184	Taylor'sport Ln (end/Sheridan)	33.7
185	Tower Manor Dr (end/Tower)	33.4
186	S. Indian Hill Rd (Indian Hill/Ridge) - North	33.3
187	Walden Rd (Westmoor/Pine)	33.3
188	Wilson St (Willow/Orchard)	33.2
189	Winnetka Ave (Church/Brier)	33.0
190	Woodley Rd (81 Woodley Rd/Locust)	33.0
191	Blackthorn Rd (Walden/Pine)	33.0
192	Sheridan Rd (Willow/Elder)	33.0
193	Woodley Rd (Hill/45 Woodley)	32.8
194	Hibbard Rd (Sunview Spruce)	32.7
195	Euclid Ave (Auburn/Willow)	32.7
196	Pine St (Killian/Lincoln)	32.7
197	Crescent Ln (end/Old Green Bay) - 4"	32.6
198	Heather Ln & Hickory Ln & Hazel Ln & Sumac Ln (Tower/Hazel)	32.5
199	Elder Ln (Forest/Church)	32.3
200	N. Indian Hill Rd (Indian Hill/Indian Hill Club)	32.2
201	Woodley Rd (5 Woodley/Locust)	32.2
202	Woodley Rd (45 Woodley/10 Woodley)	32.0
203	Woodley Rd (Hibbard/110 Woodley)	31.9
204	Birch St (Elm/Oak)	31.5
205	Private drive (Sheridan)	31.4
206	Ardsley Rd (Westmoor/Pine)	31.2
207	Sheridan Rd (Private/Tower)	31.2
208	Myrtle St (Sunset/Hill)	31.2
209	Woodley Rd (70 Woodley/96 Woodley)	31.1
210	Fairview Ave (Willow/Hawthorn)	31.0
211	Hill Rd (Ridge/Church) - 8"	30.3
212	Willow Rd (Birch/Wilson)	30.3
213	Fox Ln (Locust/Hill)	30.2
214	De Windt Rd & Thorn Tree Ln (Sunset/Evergreen)	30.2
215	Asbury Ave (Pine Tree/Grove)	30.1
216	Poplar St (Willow/Orchard)	30.0
217	Rosewood Ave (Westmoor/Pine)	29.7
218	Summit St (Foxdale/Prospect)	29.5
219	Essex Rd (Elder/Winnetka)	29.5
220	Tower Rd (Pine Tree/Bell)	29.3
221	Winnetka Ave (Wilson/Warwick)	28.7
222	Pelham Rd (Pine/Rosewood)	28.6
223	Ravine Rd (end/Sheridan)	28.5
224	Woodley Rd (45 Woodley/70 Woodley)	28.1
225	Hibbard Rd (Tower/Westmoor)	28.0
226	Church Rd (Winnetka/Meadow)	27.9
227	Hubbard Pl (end/Old Green Bay)	27.5
228	Hill Rd (Apple Tree/Thorn Tree)	26.0

Water Main Replacement Plan
Segments Ranked by Total Parameter Value
Winnetka, IL

Rank	Segment	Total Parameter Value
229	Walnut St (Sheridan/Oak)	26.0
230	Crow Island (Willow)	25.7
231	Glen Oak Rd (Sheridan/end)	25.5
232	Longmeadow Rd (Longmeadow/Hibbard)	25.3
233	Private Drive (695 Sheridan)	25.1
234	Bell Ln (Tower/Tower)	24.5
235	Locust St (Spruce/Elm)	23.4
236	Locust Rd (Indian Hill/Woodley)	21.9

 : Main to be abandoned (2016)

EXHIBIT 3 - COST ESTIMATE

Village of Winnetka
89470 - Water Main Replacement Program
Cost Estimate
8/15/2016

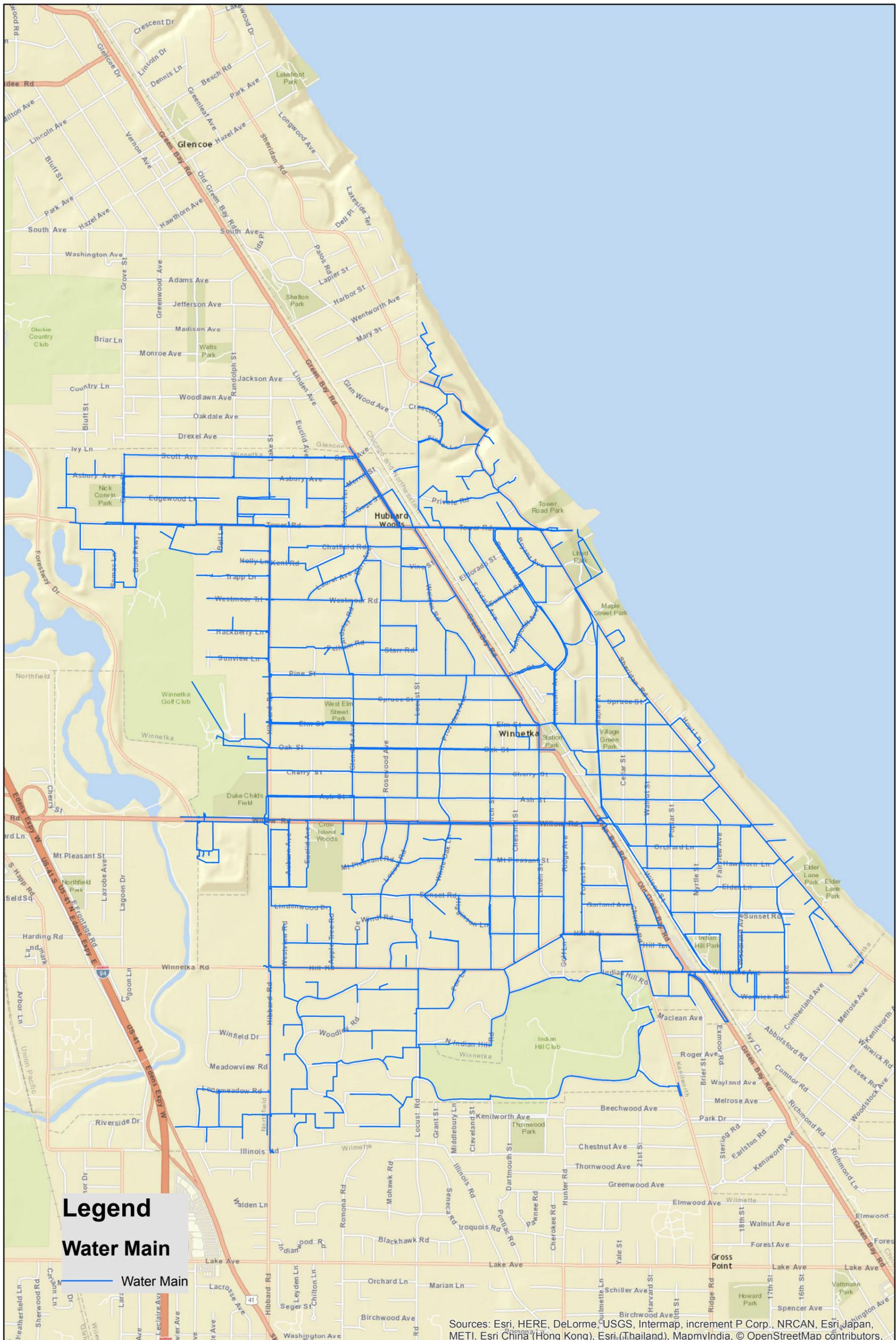
Item Name	Unit	Quantity	Unit Cost	2017	2018	2019	2020	2021	2022	2023	2024	2025
				Cherry St (Birch/Ridge)	Spruce St (Glendale/Locust)	Ash St (Glendale/Birch)	Hackberry Ln (Hibbard/end)	Ash St (Birch/Green Bay)	Spruce St (Locust/Green Bay)	Elm St (Locust/Provident) & N/S Forest Glen Dr	Asbury Ave (Grove/Lake)	Cherry St (Maple/Sheridan) & Sunset Rd (Poplar/Essex)
Water Main - 6" Diameter	Foot	0	\$ 135									
Water Main - 8" Diameter	Foot	5,324	\$ 170	1,304	1,154	1,469	1,397	1,679	1,888	2,121	2,792	3,953
Water Main - 10" Diameter	Foot	0	\$ 195									
Water Main - 12" Diameter	Foot	0	\$ 225									
Water Main - 16" Diameter	Foot	0	\$ 280									
Water Main - 20" Diameter	Foot	0	\$ 380									
Water Main - 24" Diameter	Foot	0	\$ 430									
Water Main Valves in Vaults ¹	Each	18	\$ 9,100	4	4	5	5	6	6	7	9	13
Water Service Connections ²	Each	142	\$ 3,400	35	31	39	37	45	50	57	74	105
Fire Hydrants and Leads ³	Each	18	\$ 6,400	4	4	5	5	6	6	7	9	13
Excavation & Trenching	CY	5,521	\$ 11	1,352	1,197	1,523	1,449	1,741	1,958	2,200	2,895	4,099
Trench Backfill ⁴	CY	5,127	\$ 43	1,256	1,111	1,415	1,345	1,617	1,818	2,042	2,689	3,807
Pavement Removal & Patching ⁵	SY	4,732	\$ 125	1,159	1,026	1,306	1,242	1,492	1,678	1,885	2,482	3,514
Restoration	SY	7,099	\$ 10	1,739	1,539	1,959	1,863	2,239	2,517	2,828	3,723	5,271
Subtotal				\$ 638,429	\$ 564,990	\$ 719,212	\$ 683,961	\$ 822,026	\$ 924,351	\$ 1,038,426	\$ 1,366,943	\$ 1,935,360
Contingencies				\$ 191,529	\$ 169,497	\$ 215,763	\$ 205,188	\$ 246,608	\$ 277,305	\$ 311,528	\$ 410,083	\$ 580,608
Engineering & Administration				\$ 127,686	\$ 112,998	\$ 143,842	\$ 136,792	\$ 164,405	\$ 184,870	\$ 207,685	\$ 273,389	\$ 387,072
EOPCC (rounded)				\$ 958,000	\$ 847,000	\$ 1,079,000	\$ 1,026,000	\$ 1,233,000	\$ 1,387,000	\$ 1,558,000	\$ 2,050,000	\$ 2,903,000
Budget				\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,100,000	\$ 1,200,000	\$ 1,300,000	\$ 1,600,000	\$ 2,000,000	\$ 2,900,000

Notes:

- 1 Two (2) valves in vaults for every 600 feet have been included to connect to existing water main.
- 2 Sixteen (16) water service connections have been included for every 600 feet of water main.
- 3 One (1) fire hydrant has been included for every 300 feet of water main.
- 4 Select granular backfill has been included, anticipating that all water main is located under a street.
- 5 Pavement patching for one 8-foot wide bituminous traffic lane has been included.

EXHIBIT 4 - FIGURES

Path: Z:\Clients\WTR\Winnetka\189470_Rate\WM\Design\Civil\Water Main Replacement\GIS\189470_WaterMains_1-26-2016.mxd
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Legend
Water Main
Water Main

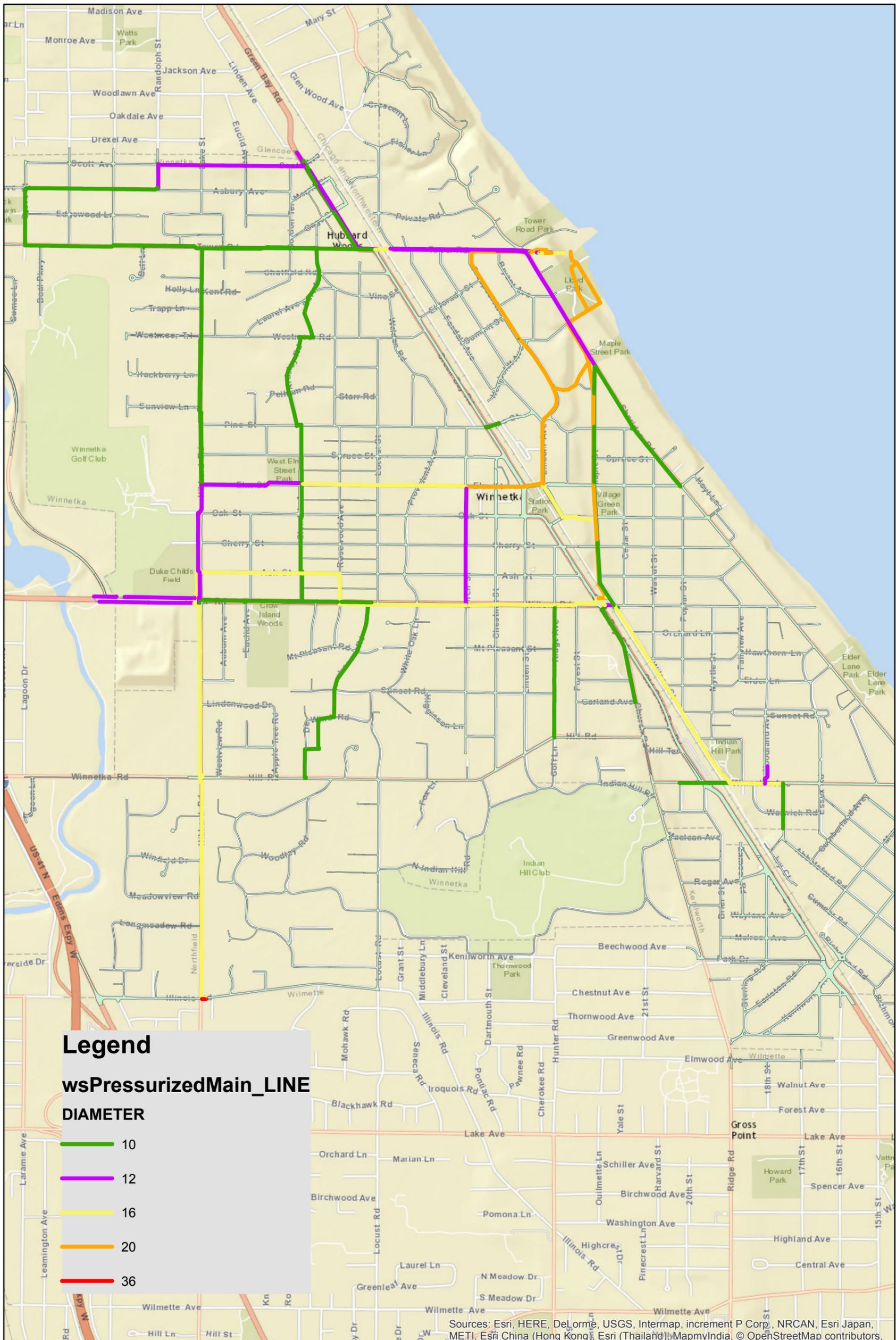
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri, Japan, METI, Esri China (Hong Kong), Esri, (Thailand), MapmyIndia, © OpenStreetMap contributors.

Water Mains



Figure

Path: Z:\Clients\WTR\Winnetka\189470_Rate\WM\Design\Civil\Water Main Replacement\GIS\189470_WaterMains_1-26-2016.mxd
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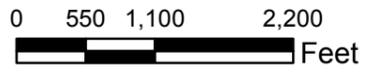


Legend
wsPressurizedMain_LINE
DIAMETER

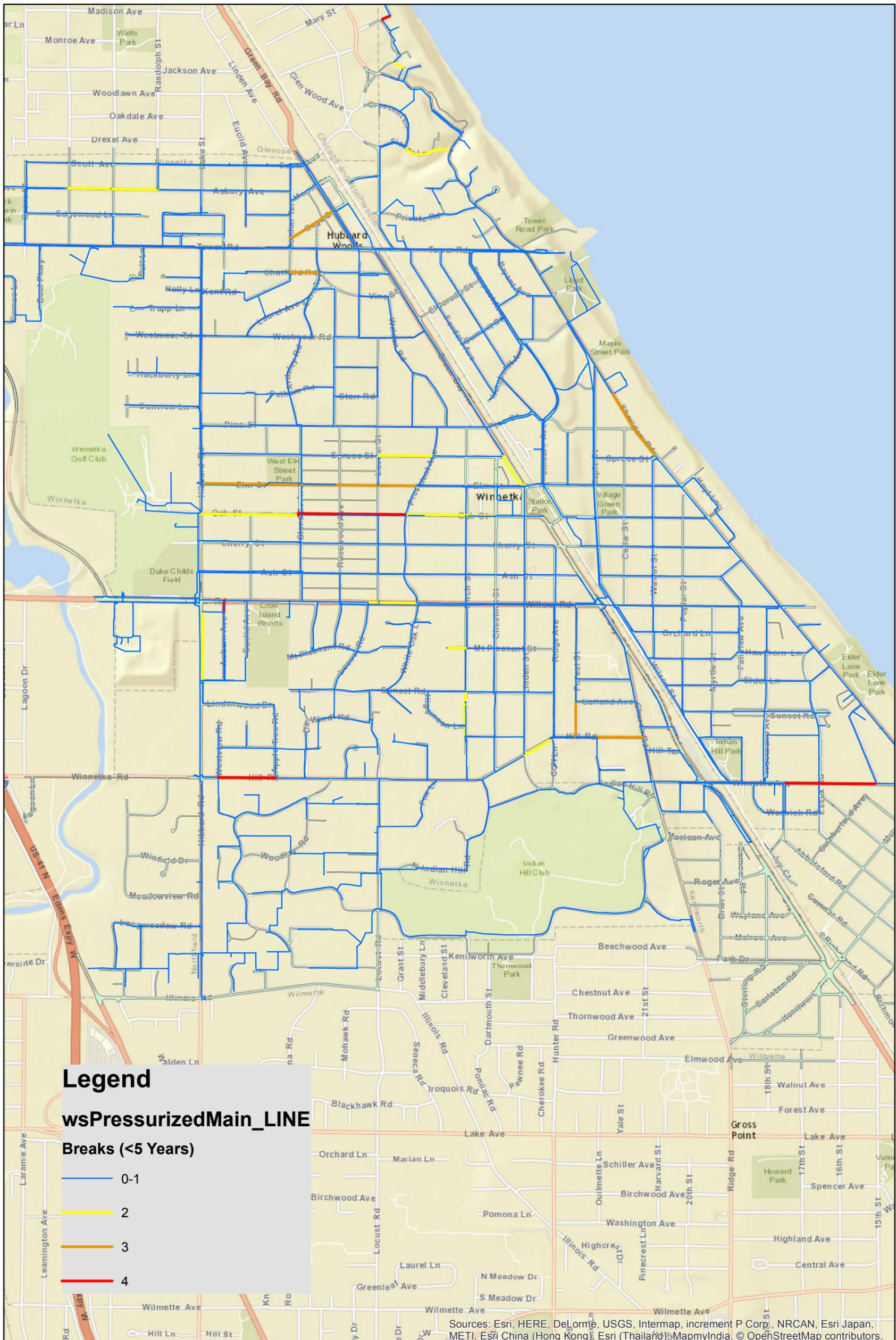
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- 12
- 16
- 20
- 36

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors.

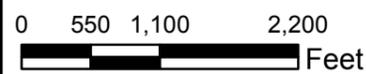
Water Main Size



Figure



Water Main Size



Figure



CREATE AMAZING.

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