INTER OFFICE

MEMO

To: Diana Mikula, Interim-Village Manager
From: Scott Shirley, Director of Public Works
Thomas F. Kuehne, Finance Director/Treasurer
Date: August 15, 2014
Subject: **PROPOSED FIVE-YEAR WATER AND SEWER RATE ADJUSTMENT**

OVERVIEW

The Village of Arlington Heights owns and operates its Water Storage, Distribution, and Sewer Collection Systems. The Village receives treated water from Lake Michigan through the Northwest Water Commission (NWC) transmission lines. The Village receives, monitors, and redistributes the Lake water into the water distribution system. The Water System is comprised of emergency water wells, potable water booster pumps, water storage tanks, water mains, hydrants, meters and the Supervisory Control and Data Acquisition (SCADA) System.

The sanitary sewer system is comprised of combined sanitary and storm sewer mains and sanitary-only mains. Combined sewers handle residential and commercial waste as well as storm water, while sanitary-only systems handle only residential and commercial waste. The sanitary system is comprised of sewer lift stations and sewer mains with their associated structures. The Village's storm water-only system is comprised of storm water lift stations, storm water mains with associated structures and detention/retention basins for temporary storage. The SCADA system also monitors the operation of all sanitary sewer and storm water lift stations.

POTABLE WATER SYSTEM

Water Mains - The Village has 260 miles of water main and approximately 32 million gallons of available water storage. The Water System's average age for water mains is 61 years. The design life expectancy of a water main is 100 years. The Village currently replaces less than ½ mile per year at an estimated annual cost of about $400,000. At this rate, the Village will not replace the existing water main system before the end of its useful life. As you can see on **Exhibit A** (Graph of Water Main Age), the Village had significant expansion during the 1920-1930's and then again in 1950-1970's. As a result of these concentrated expansions, we are approaching the useful life on a significant portion of the system's water main. Water main breaks are used as an indicator of system condition. According to the American Water Works Association, water utilities should strive for between 25 and 30 water main breaks per 100 miles of water main per year. The table below depicts the past five years of repairs for the Village of Arlington Heights:

	2009	2010	2011	2012	2013
Number of Water Main Breaks	163	284	226	347	205
Number of Water Main Breaks per 100 miles of main	63	109	87	133	79

Over the last 5 years, the Village is averaging 94 breaks per 100 miles of water main. Based on the results of a Northwest Municipal Conference (NWMC) survey, the average number of breaks per 100 miles of water main was 42 for the seventeen communities who responded. The average annual breaks for the nine communities whose water mains are 50 years or older is 46 breaks per 100 miles of water main per year.

In an effort to combat the excessive water main breaks, the Village has developed several programs over the years including an aggressive Leak Detection Program, a Surge Suppressor Installation Program, and a Sacrificial Anode Installation Program. The Village also continues to phase in the installation of variable frequency drives at our booster stations. Although these programs have been successful, they are preventative measures only and can aid in extending the life of the watermain, but cannot substitute needed replacements.

The Illinois Department of Natural Resources (IDNR) – The IDNR has recently implemented changes to the Lake Michigan Water Allocation program, which is a federally mandated program that regulates lake water use. The most significant change is the Unaccounted for Flow (UAF). Unaccounted for Flows are allowable water losses that reduce our reportable water loss due to age, size and material of our water main. Proposed rules eliminate these factors leading to stricter requirements. The new rule requires reportable water loss to be no greater than 12 % of total pumpage in 2015 decreasing to 10 % by 2019 without any allowable water loss factors. During FY2014, the difference between water pumped and water sold for the Village was 12%.

The IDNR is forcing this trend down through its Maximum Unavoidable Leakage (MUL) rating. Any system with a MUL above 8% will be required to submit a plan on how to reduce the total loss to no more than 8% in the future. Although "tightening" the system is a good practice, this regulation creates a mandatory expense. At this point Staff believes that the Village should increase its funding to allow for replacement of 1% of its system per year. This would require an increase in annual water main replacement cost from the current average of about $400,000 per year to an estimated annual program cost of $3,700,000. The attached Alternatives 1 and 2 show this level of funding being reached after five years, and over an eight year time period in Alternatives 3 and 4.

Water Tank Storage - The Village's 32 million gallons of water storage is contained in a series of elevated and ground (stand style) tanks. The water tanks are all constructed of painted steel. Coatings for steel tanks typically last 15 to 25 years depending on completed yearly maintenance. The major expense for re-coating tanks is when work-site containment is necessary when removal of an exterior coating is required. The cost to repaint a water storage tank depends upon the size and construction type and can range anywhere from $300,000 – $900,000. Elevated storage tanks store the majority of water in a sphere elevated in the air while stand pipes are cylindrical in shape

and provide the same amount of storage throughout the height of the structure. The estimated future cost of tank maintenance is included in the attached Alternatives 1 through 4.

SCADA System - The SCADA system is the computer hardware and software platform that monitors and controls all of the Village's critical water, sewer and storm water facilities throughout the Village. The hardware portion of the system is comprised of Programmable Logic Controllers or PLC's. The PLC's were last upgraded in 2003 and are expected to last 15 to 20 years. The Village will need to start a phased replacement program beginning in February 2019. The estimated costs will be $50,000/year with the program expected to last 10 years.

Deep Wells - The Village maintains six deep wells in case of emergency. These wells are pumped monthly into the sewer system and are tested regularly for water quality. The Village has excellent water storage capacity, but with one main connection to NWC, the Village remains susceptible to catastrophic loss if a break occurs. The emergency wells provide the Village with needed additional capacity in case of such a catastrophic loss of service. At this present time, five of our six wells have been recently rehabilitated and the sixth is producing an acceptable amount of water.

Water Meters - The Water System accounts for water usage through the use of residential, commercial, and industrial meters. These meters measure the water flowing through a service and are used for billing purpose. Residential meters consist of a meter and radio. The meters typically last about 20-25 years before accuracy is reduced below a reasonable level. The radios are used to send the signal to our water meter readers as they drive down the street once every other month. The radio unit's batteries last roughly 15 to 20 years until they have to be replaced.

SANITARY/COMBINED SEWER SYSTEM

The Village owns and maintains approximately 254 miles of sanitary sewer and 212 miles of storm sewer. The sanitary sewer system is comprised of combined sanitary and storm sewer mains and sanitary-only mains. The average age of the combined sewer system is 88 years old and the average age of the sanitary only system is 54 years old. The sewers are made of clay, which has an estimated life expectancy of 100 years. The Village started a rehabilitation program about four years ago and has been completing roughly 1.3 miles per year. At this rate, the Village will not replace the sanitary sewer system prior to the estimated end of its service life.

The Village maintains 13 sewer lift stations. These lift stations handle either storm or sanitary waste and are typically comprised of a Motor Control Cabinet, submersible pumps and a holding tank. The pumps and equipment work in a harsh environment and can be expected to last between 15 and 20 years prior to either rehabilitation or replacement. The future cost to maintain these facilities are also included in the attached Alternatives 1 through 4.

STORM SEWER SYSTEM

The Storm Sewer System is comprised of approximately 212 miles of storm sewer with 9,462 related structures. The Village does not currently have a storm sewer rehabilitation program. The Village repairs failures as they are identified by either residents or Staff. The first part of establishing a rehabilitation program would be an overall assessment of the system's condition. Based on the size of the system, an analysis will most likely take two years to complete. Four million dollars, (roughly $2.68/Ft and $100/structure) would be needed for a program to lightly clean, televise and analyze the condition of the Village's entire storm sewer system. Storm sewer-only work is not part of the Water and Sewer system, and revenues in the Water and Sewer Fund do

not support storm sewer-only or detention/retention basin expenses. Costs for these systems would need to be budgeted in the Village's Flood V Fund. It is recommended that discussion of a storm sewer system maintenance program be held in conjunction with the Village's upcoming presentation of the flood study results.

FUTURE NEEDS

Over the next five years Staff believes that the Water System's most pressing needs are to provide sufficient funding for water tank maintenance and to enhance the water main replacement program.

If the Village continues the current practice of replacing less than 0.1% of the existing water main within the Village, the possible ramifications will increase exponentially, as the existing water main continues to age beyond its useful life. As the system ages, it is fair to assume that the rate of failure will also increase. Additional failures increase the potential for injuries to repair personnel and extend the time customers are without water. This can be a nuisance to residents, but can become a significant problem to critical customers such as the Northwest Community Hospital and local assisted care living centers.

Large water main failures could potentially result in system-wide boil order notices that could lead to diminished customer confidence and potential health issues. Increased water losses caused by the failures could also negatively impact our State mandates for water conservation and our State ISO (Insurance Services Office) rating. Water conservation mandates are associated with our Lake Water allocation permit, and failure to maintain these requirements could lead to Sate mandated system repairs.

Water tanks are designed for peak water use and fire protection. Delaying required maintenance increases the chance for reduced fire protection in an emergency. The eleven Village-owned water tanks are made of painted metal that need continued maintenance both inside and outside to ensure containment integrity.

PROPOSED WATER AND SEWER RATE ALTERNATIVES

As outlined above, the Village's water and sanitary sewer infrastructure is over 60 years old, and the current level of investment to maintain these systems is inadequate. One of the results of the aging of our water system is an increase in water main breaks. The average number of water main breaks per 100 miles of water main per year in the Village of Arlington Heights is twice that of comparable communities.

To cover the cost of the significant increase in the Village's investment in its water and sewer infrastructure as proposed by the Public Works Department, four water and sewer rate alternatives were developed by Public Works and Finance Staff for the Board's consideration. These recommendations continue the Village's "pay as you go" funding philosophy for the water and sewer system's annual operating and capital costs. To develop these alternatives, Staff used the first ten years of the Public Works Department's 20-year infrastructure replacement cost projections. Revenue projections are based on 2.6 billion gallons of water sold per year, which reflects the lower usage trend that the Village has experienced over the last ten years.

Increasing the scale of water and sewer infrastructure improvements would take the Public Works Department a couple of years to engineer and plan out. As such, the first year of each five-year rate increase alternative starts with a 5% increase. The second year of Alternatives 2 through 4 shows a

larger increase to reflect the significant increase in planned sewer rehabilitation, water main replacement, and water tank painting expenses. Although data for ten years is reflected in the attached projections, Staff recommends that a five-year water and sewer rate plan be implemented, as projections beyond five-years include more uncertainty about the economy, weather cycles, and changes in technology.

FY2015 is the final year of the Village's previous water and sewer rate plan that included increasing rates by a combined 5% per year for five years. **Exhibit B** shows the results of the Village's recent Water & Sewer Rate Survey of area communities. As shown in this attachment, the Village's current combined rate of $5.56 per 1,000 gallons is much lower than the current average combined rate for comparable communities of $8.31 per 1,000 gallons. **Exhibit C** provides a summary of the proposed alternative rate increases for an average homeowner. The proposed five-year water and sewer rate alternatives are as follows:

Alternative 1: 5% per year over 5 years - Alternative 1 would cover the Village's current low level of infrastructure costs however; it would not cover the recommended increase in annual water and sanitary sewer infrastructure improvements.

Alternative 2: Five year percent increase amounts of 5-25-5-5-5 - Alternative 2 would allow the Village to reach the recommended annual water and sanitary sewer infrastructure expense level by 2019.

Alternative 3: Five year percent increase amounts of 5-19-5-5-5 - By increasing the annual water and sanitary sewer infrastructure expenses more gradually, the Village would reach the recommend annual infrastructure improvement level by 2022.

Alternative 4: Five year percent increase amounts of 5-10-10-10-5 - By increasing the annual water and sanitary sewer infrastructure expenses more gradually and spreading out the water and sewer rate increases, the Village would reach the recommend annual infrastructure improvement level by 2022.

RECOMMENDATION

Due to the advanced age of the Village's water and sanitary sewer systems, the high number of annual water main breaks, and the need to increase significantly the annual water and sewer infrastructure improvements, Staff recommends Alternative 2 or 3. Both of these alternatives present a sustainable plan to fund the recommended improvements. Alternative 2 would reach the recommended level by 2019 and Alternative 3 reaches the recommended level by 2022.

It should also be noted that the 2014 Water and Sewer Rate Survey shows the average combined rate for area communities is currently $8.31 per 1,000 gallons. After five years, the Village's combined rate under Alternative 3 would still be below this level at $8.04 per 1,000 gallons and slightly above at $8.45 per 1,000 gallons under Alternative 2. It could also easily be assumed that the other area communities listed in the survey will increase their water and sewer rates further over the next five years.

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