

# 2013 Annual Report

FEBRUARY 2014

CITY OF NORTH POLE UTILITY DEPARTMENT

## 2013 Highlights

- *Utility received a \$1 million grant for wastewater treatment plant renovations*
- *Lining of over a mile of sewer mains completed in 2013*
- *Tanana River channel where Utility discharges wastewater ran dry in fall 2013*

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## Utility Loses River Flow at Wastewater Discharge Site

For over 30 years, the Utility has been treating wastewater and discharging the treated wastewater to a small side channel of the Tanana River. The Alaska Department of Environmental Conservation (ADEC) regulates this treated wastewater discharge. The Utili-



*Dry discharge channel on the Tanana River*

ty's discharge permit requires the wastewater discharged to the Tanana River be sampled and tested to ensure it meets permit limits.

In spring 2012 when collecting permit-required samples, the Utility found the discharge channel had no river flow. Flow returned to the channel within a month, but the situation was a violation of the Utility's discharge permit. ADEC did not penalize the Utility because the loss of river flow was an act of nature.

In October 2013 when Utility staff went to collect wastewater discharge samples they found the river channel had again gone dry. With freezing temperatures and no likelihood of rain, river flow to the discharge channel is not expected to return until spring 2014. The Utility is again in

violation of its discharge permit.

There are no records of the discharge channel going dry prior to 2012. Because the discharge channel has gone dry twice in 18 months, ADEC is expected to require the Utility develop a solution to the repeated loss of river flow in the discharge channel. Possible solutions include a longer pipe to a more reliable river channel; construction of an on-site pond that will function like a large leach field; or a modified discharge permit that will allow the Utility to discharge as it has for the past 30 years even when the river channel runs dry. ADEC and, the Department of Natural Resources that regulate the Tanana River, will determine what alternative the Utility will be allowed to use. The cost to resolve this problem could range from hundreds of thousands to millions of dollars.

## Draft Plans Submitted for Water System Upgrades

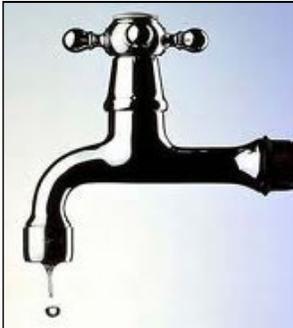
Recent grants and gifts have made possible significant upgrades at the water treatment and distribution system. Recent upgrades include: a \$600,000 federal economic stimulus award to replace the aging pumps at the water treatment plant with new energy efficient

pumps; Flint Hills Resources constructed two new drinking water wells valued at \$4.4 million; Flint Hills Resources installed water mains in the Ford Subdivision valued at \$1.7 million. Flint Hills initiated these projects to assure that there was no sulfolane contamination in

the public water supply and to provide public water service to homes whose wells were contaminated with sulfolane.

The Utility's water treatment plant is about 25 years old and parts of the distribution system are over 40 years old and need

*Continued on page 3.*



## Lead and Copper Rule

In 1991 EPA, implemented the Lead and Copper Rule. Lead and copper contamination is often traced to aging plumbing fixtures. Lead can no longer be used in solder for plumbing fixtures, but there is no regulation mandating removal of aging fixtures where it is present. The acidity (pH) of water can affect the corrosion of lead and copper.

The concern with lead and copper is that even at very low levels they may cause health prob-

lems ranging from stomach distress to nerve damage.

The Utility is required to annually collect water samples at customers' taps and test the water for lead and copper. The Utility has the samples tested at a certified private laboratory. If lead concentrations exceed an action level of 15 parts per billion (ppb) or copper concentrations exceed an action level of 1.3 parts per million (ppm) in more than 10% of customer taps sampled, the system must un-

dertake steps to control the contamination. The Utility's routine sampling for lead and copper have not found either contaminate in excess of the mandated action levels. The Utility annually sends a water quality report to all utility customers that summarizes water testing results that include lead and copper levels.

The Utility appreciates those utility customers who volunteer their time to collect water samples for lead and copper testing.

## Capital Projects Utility Rates Increased

In December 2013, the City Council approved an increase in the Facility Repair and Replacement (FRR) water and sewer rates for 2014. The FRR rates changed from \$0.0015 to \$0.0025 per gallon of water used and wastewater produced. The water, sewer and base rates remained unchanged for 2014. The Utility dedicates the FRR revenue to fund projects like the

planned sewer plant renovation and to make loan payments for previous projects. In the past six years, the Utility has received over \$14 million in grants and loans to address deferred maintenance projects; for example, eight sewer lift stations were renovated; water pumps were replaced in the water treatment plant; over a mile of aging sewer mains were lined;

and a utility garage was constructed. The Utility has funded many of its capital projects over the past six years with ADEC matching grants. These grants require that the Utility contribute 30% of the project cost. Without the capital project funds generated by the FRR, many of the recent capital improvements to the Utility would not have been possible.

## Wastewater Discharge Permit Extended Indefinitely

After wastewater has gone through the treatment process, the Utility discharges it to the Tanana River. ADEC regulates the discharge of public wastewater treatment plants by issuing permits. The Utility's permit authorizes the discharge of up to 500,000 gallons per day of treated wastewater to the Tanana River.

The Utility's wastewater discharge permit was scheduled to be renewed in June 2013. ADEC administratively extended the discharge permit indefinitely while it conducted additional analysis of the Utility's discharge to the Tanana River.

The uncertainties associated with the loss of flow in the channel of the Tanana River where

the Utility discharges treated wastewater led ADEC to continue the administrative extension of the Utility's discharge permit. (See related story, page 1: *Utility Loses River Flow at Wastewater Discharge Site.*) ADEC could continue the administrative extension as long as it takes to resolve the Utility's problem with the loss of flow in the wastewater discharge channel.

## Draft Plans Submitted for Water System Upgrades (con't.)

(Continued from page 1.)

rehabilitation, replacement and the Utility needs to plan for future expansion. The Utility received combined funding of \$500,000 from USDA and ADEC to analyze the water system, propose needed upgrades and to engineer the needed upgrades. In December 2013, PDC Engineers, the firm responsible for the engineering, submitted a report with prioritized recommendations for upgrades to the water treatment and distribution system. Some of the critical projects PDC recommended included replacement of the emergency

fire pump; replacement of the emergency generator; replacement of failing valves in the water distribution system; construction of additional reservoir capacity; replacement of aging steel water mains; and installation of emergency generators at water circulation stations.

All of PDC's recommendations would cost almost \$14 million. The Utility cannot afford \$14 million in construction projects especially when combined with the recommended rehabilitation and expansion projects proposed for the wastewater treatment plant. (See related story, page 4: *City Received \$1 Million Grant for Wastewater Treatment*

*Plant Renovation.*) In cooperation with the Utility, PDC proposed a priority list of construction projects for rehabilitation and future expansion of the water treatment and distribution system. The Utility will seek external funding from the state and other sources to help finance the most critical projects.



*Three of the pumps installed at the water treatment plant with funding from a \$600,000 federal economic stimulus grant.*

## Sulfolane Groundwater Contamination Update

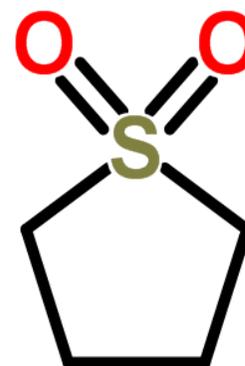
ADEC mandates that the Utility sample each drinking water well twice per year for sulfolane. Tests on water from the Utility's new wells have never detected sulfolane. As quality control, third-party private laboratories sample and test the water for the presence of sulfolane. The two new wells are located approximately one-half mile west of the sulfolane contaminated groundwater plume. The wells take water from depths starting at 122 and 145 feet.

Our industrial society uses thousands of chemicals and only a fraction have been extensively studied. Sulfolane is not a wide-

ly used chemical and only limited studies of its toxicity have been conducted. The Environmental Protection Agency (EPA) sets toxicity values for known toxic substances. ADEC requested EPA develop a Provisional Peer Reviewed Toxicity Value (PPRTV) based upon what was known about sulfolane. In 2012, EPA established a PPRTV for sulfolane. Based upon EPA's determination, ADEC set 14 ppb as the site-specific cleanup level for the North Pole sulfolane plume.

The expert determination is that the 14 ppb level is protective of human health for drink-

ing water, gardening and other general purposes. The definition of cleanup level is the highest concentration of a hazardous substance that may be left in groundwater. For more information about sulfolane contamination in the North Pole area, see the ADEC website ([dec.alaska.gov](http://dec.alaska.gov)). In the Quick Links section, click North Pole Sulfolane.



*Sulfolane molecule is composed of carbon, hydrogen, oxygen and sulfur: C<sub>4</sub>H<sub>8</sub>O<sub>2</sub>S*

**Source:** ADEC, Contaminated Sites Program, North Pole Refinery - Project Home, Frequently Asked Questions.

## Sewer Lining and Manhole Repair Project Completed in 2013

The Utility received a \$2.5 million grant and \$1.4 million loan from ADEC to finance the sewer lining project. Due to lower than expected construction costs, the project cost only \$2.25 million. The Utility is

expected to use less than \$700,000 of the loan. In addition, ADEC will forgive as much as 15% of the loan.

The Utility's sewer lining and manhole rehabilitation project started in June 2013 and was

completed in September 2013. The project lined over a mile of aging Techite sewer mains and repaired leaking manholes.

The estimated infiltration of groundwater into the sewer system through damaged sewer mains and manholes was over 30 percent of the flow to the wastewater treatment plant.

Techite was a product developed in the late 1960s and it was installed in utility and storm water projects around the nation in the 1970s. Techite proved to be prone to cracking and collapsing.

Manholes function as access points to the sewer system for repair and cleaning of the system. Many manholes had

groundwater leaking into them. One manhole located on the Old Richardson Highway had a major leak of tens of gallons per minute 24 hours per day.

With the completion of this project, all the Techite sewer mains in the City have been lined. The life expectancy of the newly lined pipes is 40 years, comparable to ductile iron, the preferred type of sewer pipe. Excavating and replacing the Techite pipe with ductile iron pipe had a projected cost of \$5 million to \$7 million. Lining the sewer mains also resulted in less disruption of neighborhoods compared to the excavation and replacement option.



*Sewer lining equipment working on Holiday Road. The white tube is the sewer liner.*

## City Received \$1 Million Grant for Wastewater Treatment Plant Renovation

The Utility received an ADEC grant for \$1.075 million to help fund the rehabilitation of the wastewater treatment plant (WWTP). The Utility can also use some of a \$305,000 ADEC loan to help finance the rehabilitation effort. The Utility has submitted a \$764,429 supplemental grant request to the state for the WWTP project.

The WWTP is almost 30 years old and it has had no significant renovations over those 30 years. The City received combined grants from USDA and ADEC for \$500,000 to analyze the WWTP, recommend needed renovations and engineer priority projects to be rehabilitated.

USKH, Inc. is the engineering firm working on the WWTP



*Wastewater treatment plant: Four treatment lagoons with the treatment building in the center. High School track is to the upper left, Stillmeyer Subdivision to the upper right and Transfer Station is to the right.*

project for the Utility. Some of the priority projects that USKH recommend for rehabilitation or replacement include replacement of the emergency generator that is undersized and replacement parts are unavailable; replace aging and corroding

pipings; rehabilitate the sewer lift station that has only one functioning pump and no replacement pumps are available; replace the existing aerators with aerators that will consume less electricity and provide more air for treatment; and

make building improvements—heating, electrical and ventilation upgrades.

The \$1 million grant and the supplemental grant require a 30% matching contribution from the Utility. The Utility will satisfy the matching requirement from its capital reserves generated in part by the Facility Repair and Replacement utility charges. (See related story on page 2, *Capital Projects Utility Rate Increased.*)

The Utility hopes to mobilize \$2.8 million to fund this first phase of rehabilitation at the WWTP. USKH's comprehensive list of needed rehabilitation projects at the WWTP total over \$20 million.