



Utilities and Infrastructure

KEY TAKEAWAYS

- The Greater North Pole 99705 zip code area, where most F-35-related growth is expected, offers varied levels of public utilities. Most of the area has access to electrical power. Water and sewer in this area is limited to approximately three quarters of the land within the City of North Pole, and one small water service area on the far western side of Badger Road. The quality of cellular phone service and internet access is inconsistent across this large area.
- Due to groundwater contamination, and the planned solutions to address that issue that include new infrastructure, areas west and north of the City of North Pole will be receiving public water service. A similar issue and solution is likely in the Moose Creek area. Additional research and coordination is needed to identify if these required solutions might be leveraged to support water service in addition to the areas directly impacted by groundwater contamination. Small increases in the capital costs for these projects could lead to substantial increases in areas with water service.
- New residents associated with F-35 related growth and other Borough residents are looking for quality, moderately priced housing. Expanding areas where water and sewer service is available is an essential step in meeting this need, as only with water and sewer can more affordable, smaller lot single family homes and multifamily housing be built. Work is in progress and needs to continue to find solutions to the near-term challenges of funding public water and sewer.
- An active partnership should be developed, working with FNSB, the Cities of North Pole and Fairbanks, EAFB, and private cellular services providers, to improve the quality of cell service across the greater North Pole, Eielson and Salcha areas.
- Through this plan, and the Salcha-Badger Road Subarea Plan occurring in parallel, the FNSB and partners should initiate more active and effective planning, working to better integrate planning for land use, transportation and utilities. One goal should be supporting expansion of water and sewer as a strategy to concentrate development and thereby address air quality challenges.
- The Borough, the cities, and economic development organizations should implement public education and outreach to build support for improved utilities, including considering new utility organizational structures and boundaries, and new funding strategies.

PROJECTED NEED

Ready access to power, telecommunication, and water and wastewater solutions will be essential to meet the expectations of new people arriving with the F-35 Beddown. Availability of utilities and infrastructure dictates where and what type of development can reasonably occur. At the same time, understanding growth trends suggests where utility and infrastructure improvements may be needed.

This chapter starts with a general inventory of utilities and infrastructure in the borough. It then identifies potential gaps in existing services, and sets out strategies to meet anticipated needs. Like other chapters, the chapter focused on growth associated with the F-35 Beddown, but also covers broader issues and options that can benefit all existing and future residents.

SUMMARY OF EXISTING PROGRAMS, SERVICES, INFRASTRUCTURE

Electricity

Golden Valley Electric Association (GVEA) provides electric service for the FNSB area. Power passes through 35 substations to serve the entire borough. Within the borough, the GVEA system is interconnected with independent electric systems on Ft. Wainwright, Eielson AFB and the University of Alaska-Fairbanks.

GVEA is linked with other electric utilities along the Alaska Railbelt, extending all the way to Homer, AK. Anchorage Municipal Light and Power (ML&P) is GVEA's largest supplier of gas-fired energy. In 2017, Golden Valley purchased

approximately \$21 million worth of electricity from ML&P¹. This interconnected network provides electric power continuity throughout the FNSB. GVEA can receive power from 10 powerplants, providing approximately 381MW of energy. Peak load in 2016 was 207.7 MW set at 10 p.m. on December 8 (temperature was -60 F). In 2007, the system peak of 223 MW was also set in December².

Doyon Utilities operates the electrical distribution system on Ft. Wainwright. The on-base distribution System is linked to GVEA's interconnection transformer located at the Central Heat and Power Plan (CHPP) substation. The CHPP is a coal-fired plant that generates steam and electricity to meet the heating and electricity demands of the post³. A similar structure exists on Eielson AFB, where the base has a 25 MW coal-fired power plant owned the Air Force and operated by the base personnel. Both military bases purchase a small amount of power from GVEA.

¹ <http://www.gvea.com/news> GVEA Interested in the Effects of Anchorage Utility Sale; Press Release: 2.12.18

² GVEA 2016 Year End data report. 2017

³ Doyon Utilities web page, accessed August 8, 2017

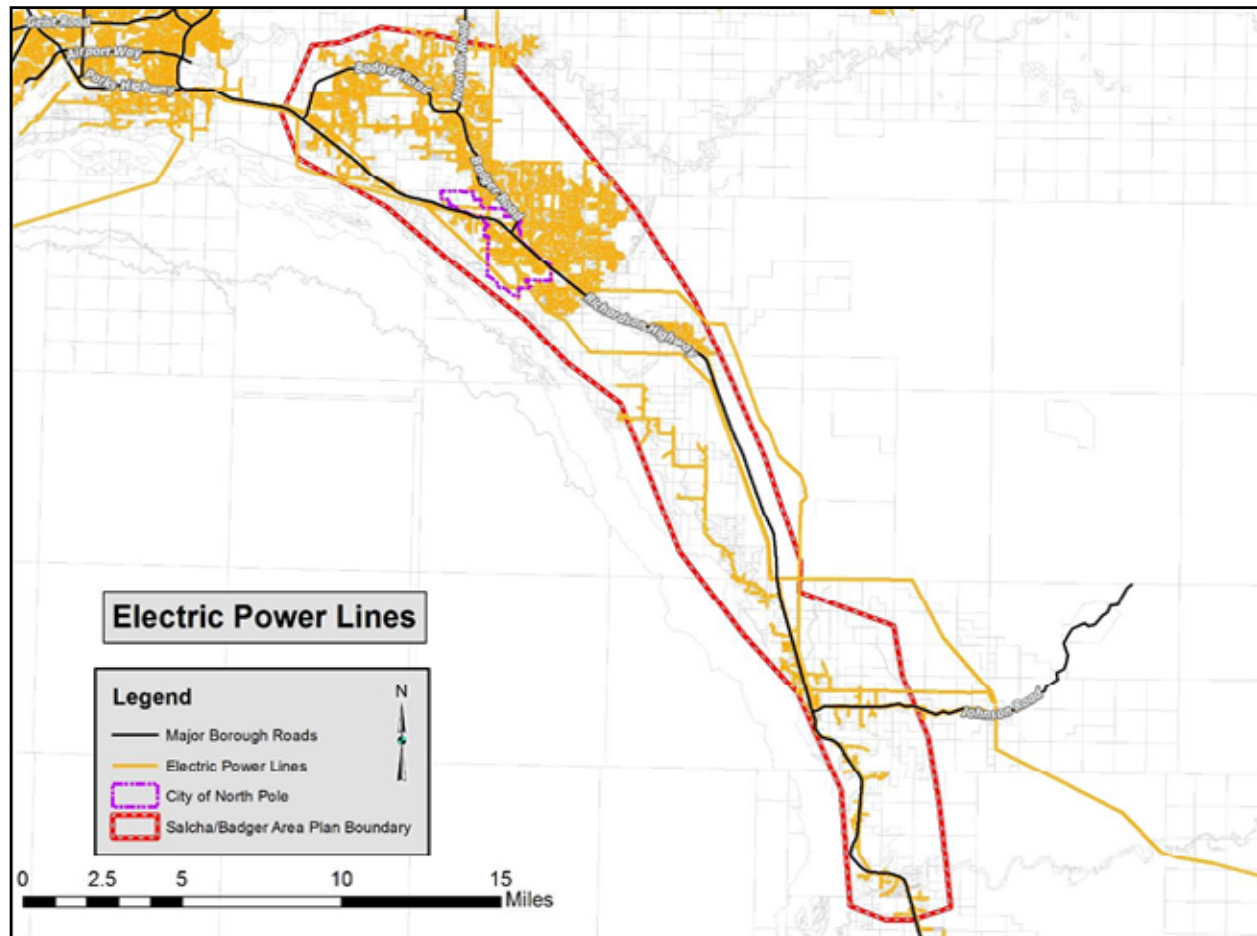
“ We will continue to work with independent power producers to integrate more renewable power into our system – as long as we can keep our members’ costs low and maintain system reliability. ”

**- Cory Borgeson
GVEA President & CEO**

The large majority of GVEA power is from non-renewable sources, but among all Railbelt electric co-ops, Golden Valley produces the highest percentage of renewable energy. GVEA is able to generate up to 20 percent of its peak load from renewable sources, including the Eva Creek Wind Farm (25 MW), Bradley Lake Hydro (20 MW) and 199 SNAP Renewable Energy Producers (1 MW). GVEA was recently given the ruling it sought from the Regulatory Commission of Alaska, stating that GVEA would not be forced to buy power from the Delta Wind Farm.



FIGURE 1: ELECTRIC POWER LINES IN THE SALCHA-BADGER ROAD AREA



Natural Gas

Unlike several communities in Southcentral Alaska, natural gas is not readily available in the FNSB. A multi-year effort is underway to provide natural gas in the region, for heating and other uses.

Natural Gas Service to the Greater North Pole Area

Interior Gas Utility (IGU) is a public corporation established to provide natural gas to the largest number of customers possible in the FNSB. IGU is making progress developing a system to deliver and distribute natural gas. Phase 1 of IGU's planned natural gas network included installation of distribution lines in the City of North Pole, south of Hurst Road to southern limits of the city (see Figure 2). IGU has a three-year supply contract

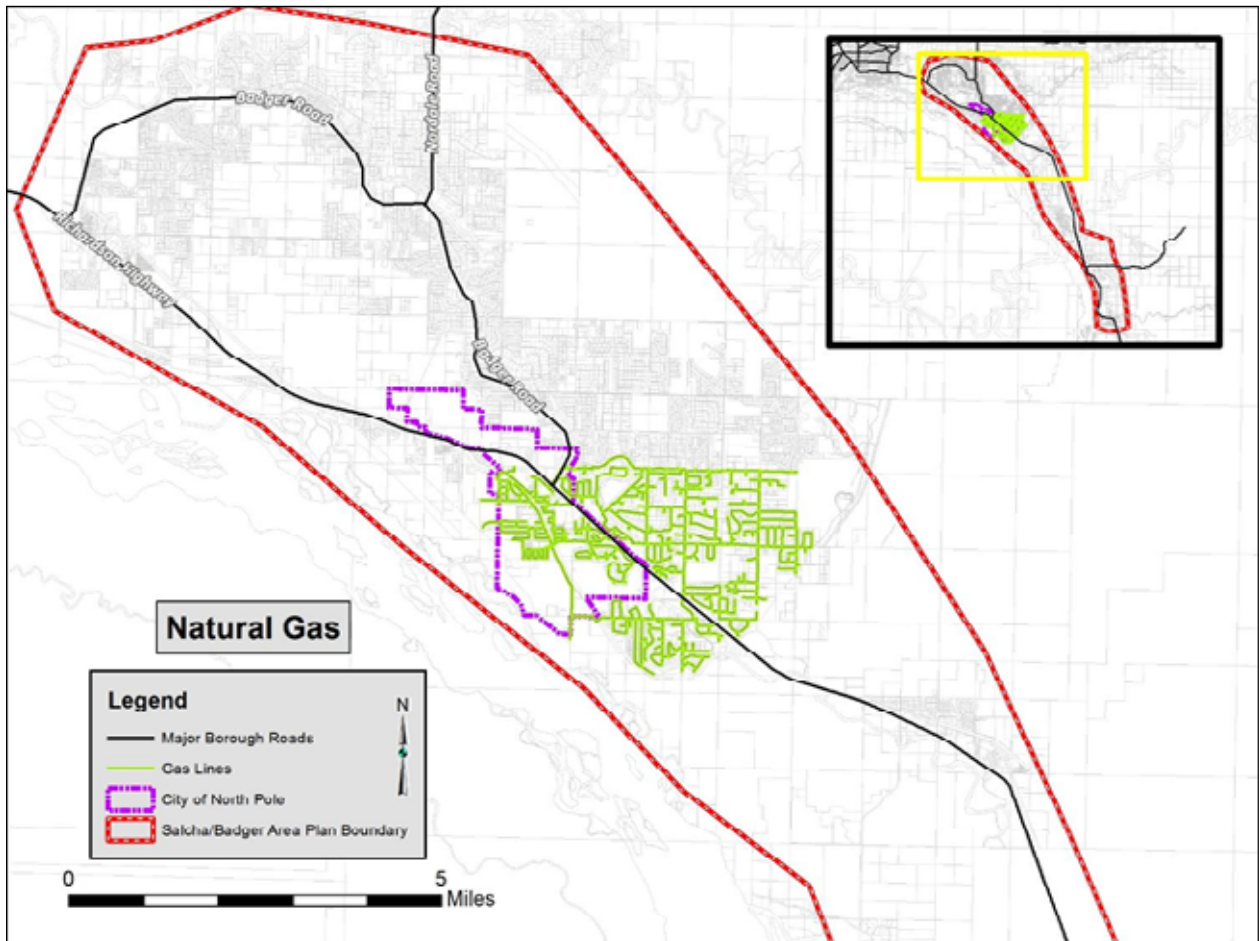
with Hilcorp Alaska for Cook Inlet natural gas for its service in North Pole. Service to customers connected to Phase 1 infrastructure is expected the 1st quarter of 2020.

Longer-Term Plans for Natural Gas in the FNSB

IGU is planning to coordinate service with Fairbanks' existing natural gas distribution operated by Fairbanks Natural Gas, LLC (FNG)⁴. FNG provides natural gas to about 1,000 residential and commercial customers in the Fairbanks area. Supplies of liquefied natural gas (LNG) are trucked from the Cook Inlet area to FNG's two storage facilities, where it is distributed through an underground system to customers.

⁴ FNG website, August 8, 2017

FIGURE 2: NATURAL GAS DISTRIBUTION LINES IN THE GREATER NORTH POLE 99705



Source: FSNB Community Planning Department

Following installation completion in North Pole, distribution lines will be installed in other parts of Fairbanks, moving north, west and ultimately south.

IGU is in the process of completing the purchase of the FNG parent company, Pentex, from AIDEA. AIDEA has been working on LNG efforts in the borough in conjunction with the Interior Energy Plan since 2013. IGU will benefit from Pentex’s experience of years of safe and reliable operation of the Fairbanks distribution system and associated LNG production, transportation and storage facilities. The IGU purchase will facilitate the integration of the two Fairbanks area natural gas utilities.⁵

Reduction of air quality emissions is one of the important benefits of a conversion to natural gas. As covered in more detail in the Land Use Chapter, the borough has been formally designated an air quality non-attainment area, which requires the Borough to develop and implement an aggressive plan to address air quality issues.

Solid Waste Disposal

South Cushman Landfill is a regional waste disposal facility operated by the FNSB. Solid waste is collected at the landfill and transfer stations located at Midway, Salcha, Thirty Mile, Moose Creek, North Pole, Badger Road, Dale Road, Chena Pump, Ester, Farmers Loop, Fox, Chatanika, and Two Rivers.⁶

For EAFB, solid waste (industrial and domestic) is collected by a contractor and disposed at the FNSB Landfill or hazardous waste collection facility. Eielson AFB owns and operates three permitted active disposal areas: Quarry Hill Inert Waste Monofill for disposing of coal ash and limited amounts of clean construction/ demolition debris; EAFB Asbestos Landfill for disposal of asbestos containing materials; and permitted areas near the runway for sewage sludge.⁷

The final build-out of the Solid Waste Facility Disposal Area will include nine lined cells. Currently, three completed cells include: Cell 1 (finished construction in 1999) was interim closed in 2010; Cell 2 (finished construction in 2005) and is still in operation; Cell 3 (finished construction in 2014) began to receive waste in July 2015.

A review of a recently prepared capacity assessment report suggests the facility has more than ample capacity to meet foreseeable demand from the F-35 growth.⁸



Credit: Fairbanks North Star Borough

⁵ Interior Gas Utility web site accessed 1/24/2018

⁶ FNSB web site accessed August 8, 2017

⁷ USAF F-35 Operational Beddown Pacific-Final EIS, 2/2016

⁸ Fairbanks North Star Borough Solid Waste Facility – Volume Calculations Report – 2016 Final Report, HDR, Mar 31, 2017.

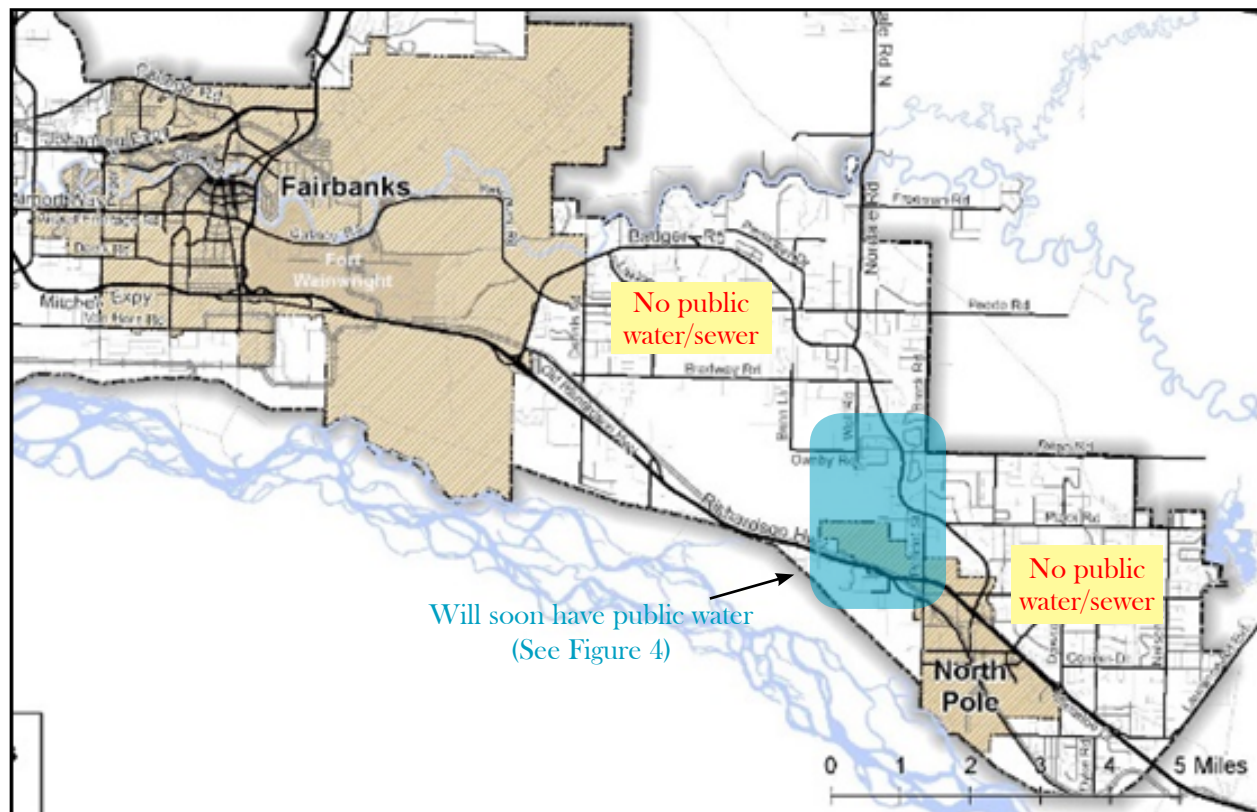
Water and Wastewater Systems

Public water and sewer service is provided by Fairbanks Sewer & Water (FSW), a private utility company within and adjoining the boundaries of the City of Fairbanks. FSW was purchased in 2009 by Corix, a Vancouver BC-based company⁹. The City of North Pole provides most water and sewer inside city boundaries. As a result of the groundwater contamination from the Flint Hills refinery, City of North Pole water service is being extended into an area north of current city boundaries, adding an additional 800 housing units to the City’s existing

customer base. Outside of City of North Pole limits, most of the Greater North Pole area relies on on-site water and wastewater systems, limiting densities to a minimum of one acre per dwelling unit. Figure 3 below provides a generalized picture of public water and sewer service; the following maps provide specific boundary information.

⁹ <http://www.marketwired.com/press-release/corix-acquires-fairbanks-sewer-water-inc-1027805.htm>

FIGURE 3: OVERVIEW OF PUBLIC WATER AND SEWER SERVICE IN THE GREATER NORTH POLE AREA



Source: 2040 Metropolitan Transportation Plan and Agnew::Beck Consulting

City of North Pole Water and Wastewater Infrastructure and Services

The City of North Pole operates a water and sewer utility that provides service to approximately three quarters of the city, about 650 residential, commercial, institutional and industrial customers (See Map 4). The remaining properties within existing city boundaries get water from wells and discharge wastewater to septic systems. By City code, any occupied structure within 200 feet of a water or sewer main must be connected to the utility system.¹⁰

The City Water Department provides potable water and fire protection in compliance with State of Alaska water standards. The utility's water comes from two new wells commissioned in 2010. Each well has the capacity to pump up to one million gallons of water per day. The water treatment plant has a capacity to produce approximately 650,000 gallons per day (gpd), but the utility averages 150,000 gpd. The utility treatment process involves removing iron, and does not add chlorine or fluoride to the water. Due to the climate, the utility heats and circulates the water in the distribution system to prevent freezing in winter in the system's 24 miles of water mains¹¹. As already mentioned, the City will soon be extending water service to new properties north of existing city boundaries.

The City of North Pole Sewer Department on average treats 250,000 gallons of wastewater per day. The utility uses a "passive system" to treat wastewater - water passes through a series of four lagoons where biological activity and settling treat the water. After passing through the treatment lagoons, the utility adds chlorine to kill coliform bacteria then adds a second compound to remove the chlorine.

The Utility discharges the treated wastewater to the Tanana River under a permit from the State of Alaska. There are approximately 14 miles of sewer mains in the city. Because the topography in North Pole is relatively flat, the utility must use a series of lift stations around the city to pump wastewater to the treatment plant.

Much of the initial construction cost for the City of North Pole water and sewer system, as well as major upgrades or replacements, has been funded by the State of Alaska. Examples include a \$1.9 million municipal matching grant in 2015 for upgrading sewer lift stations, and a \$500,000 legislative grant to develop solutions to the City's sewer outfall on the Tanana River.

When a significant expansion of the system is proposed, for example for a new subdivision, City policy requires the developer to cover associated capital costs, which can be repaid at least in part through an assessment district for the affected area. Capital costs include the distribution/collection system within the project area, and if necessary expansion of the citywide system, for example, adding a pump station for water, or a lift station for sewer. The City also on occasion turns to voters to approve increases in rates or property taxes to cover costs for larger scale projects. One example was the 2016 voter approval to accept a loan from the State of Alaska Department of Environmental Conservation to implement the solution to the sewer outfall issue.

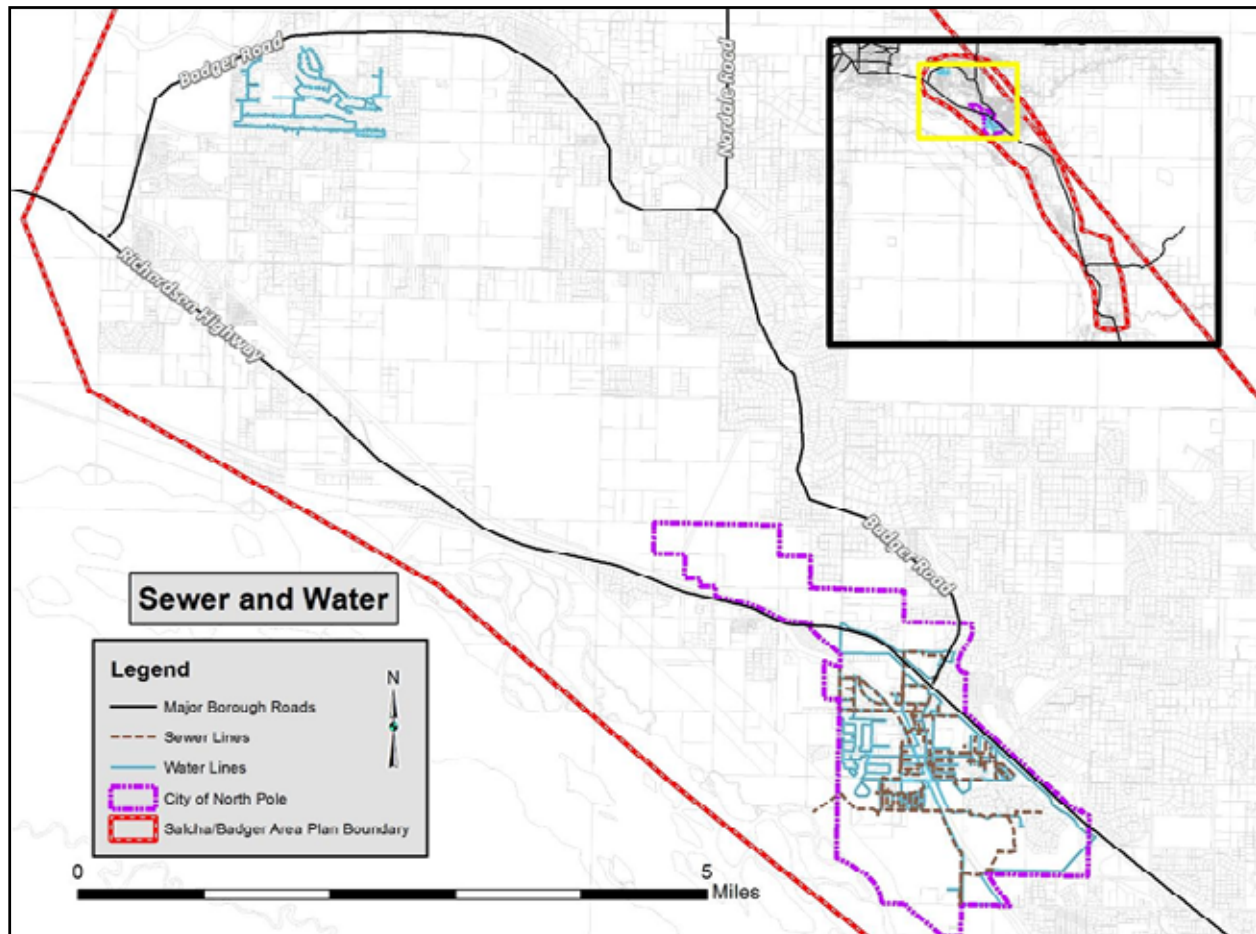
¹⁰ Interview with Bill Butler, Public Works Director, City of North Pole, 10/19/2017

¹¹ City of North Pole website

Property owners/renters pay a monthly utility fee to cover ongoing water and sewer operation costs ¹². When a property is connected to the water or sewer system the property owner pays a one-time fee to the City. Like the monthly fee, this direct charge to consumers helps cover system operation costs.

¹² City of North Pole Municipal Code, Chapter 2f for details. <http://www.codepublishing.com/AK/NorthPole/html/NorthPole13/NorthPole1324.html>

FIGURE 4: PUBLIC WATER AND SEWER SERVICE IN THE CITY OF NORTH POLE



Source: FSNB Community Planning Department

Groundwater Contamination: City of North Pole and Moose Creek Area

In 2009, the industrial solvent sulfolane was detected in drinking water wells near the Flint Hills oil refinery, located off the Old Richardson Highway in the City of North Pole, and about 15 miles east of Fairbanks.¹³ A settlement was reached requiring the refinery to pay to extend city public water system to areas of North Pole where the ground water was contaminated (see Figure 4 below). In January 2018, the City awarded a \$52.1 million contract to Exclusive Paving of Fairbanks to complete the project. Exclusive Paving is scheduled to begin surveying and land clearing in late Winter 2018, and begin installing pipes in early Spring 2019 on the city's northern boundary. Other 2018 construction activities include installing water mains in the area west of the city, often referred to as 12 Mile Village; installing water mains within the city limits north of the Richardson Highway; constructing a pump house on Peridot Road; and constructing upgrades to two North Pole Utility facilities. This project will cost approximately \$100 million, with 80 percent paid by Flint Hills, and 20 percent by the State of Alaska. In 2019, Exclusive Paving will install the remaining water mains. The City anticipates new customers can start connecting to the system in 2019 after receiving State regulatory approval.¹⁴

A different groundwater contamination problem exists in the Moose Creek area, where in 2015, wells in the area were found to be contaminated by toxic perfluorinated compounds, chemicals previously used in firefighting foams at Eielson AFB.¹⁵ Since that time, the Air Force has paid for delivery of bottled water and/or installation of water filters in affected homes. In June 2017, the Air Force published an interim feasibility study outlining options for providing clean water

in Moose Creek. Among the seven options considered are those below, with costs ranging from \$32 to \$67 million, for installation and 30 years of operation.¹⁶

- Digging deep wells below the contaminated aquifers (estimated cost, \$32.6 million).
- Extending water from the City of North Pole system, requiring installation of 5.5 miles of pipe, at a cost of approximately \$40 million. This option is supported by a 2017 City of North Pole Council resolution.
- Other options include piping water from EAFB, installing water tanks, or continuing to deliver water to individual homes by truck.

Decisions still need to be made on these issues, including responsibilities to pay installation and operations costs. A decision by the Air Force is expected in late summer 2018.¹⁷

While both groundwater contamination issues described above are clearly concerning for local residents, and costly and complex to resolve, each presents the opportunity to expand existing and establish new infrastructure that addresses contamination concerns while also providing optimal conditions for new housing construction. As identified in the housing chapter, and further explained below, the Salcha-Badger Road area, and the 99705 area specifically, have experienced significant growth over the last 15 years, and will be most impacted by the F-35 population living off base.

¹³ State of Alaska, Department of Environmental Conservation Contaminated site web site, North Pole Public Water System Expansion Project, accessed 1/23/2018

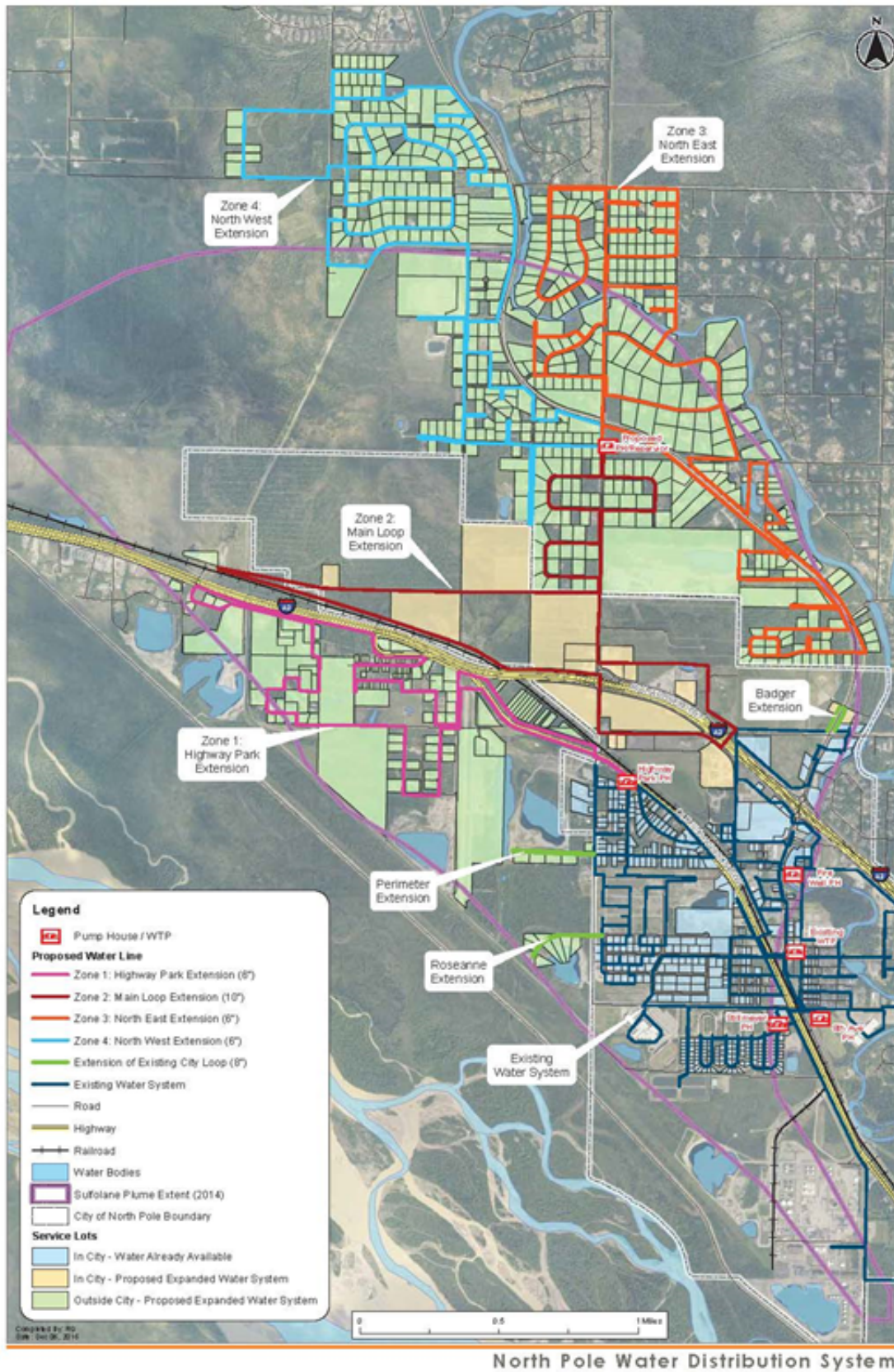
¹⁴ City of North Pole Communication, 1/25/2018

¹⁵ "Groundwater Contamination Spreads off Eielson Air Force Base" Dan Bross, KUAC, 6/17/2015

¹⁶ "Sampling Results Confirm PFAS Presence off Airport Property" FIA Press Release, 11/17/2017

¹⁷ "Air Force outlines options for tainted Moose Creek wells" Fairbanks News Miner, June 25, 2017

FIGURE 5: PLANNED EXPANSION OF PUBLIC WATER SERVICE BY THE CITY OF NORTH POLE: RESPONSE TO THE FLINT HILLS SULFOLANE CONTAMINATION



Other FNSB Water and Wastewater Utilities

Fairbanks Sewer & Water (FSW) is the parent company for five subsidiaries, including Golden Heart Utilities and College Utilities Corporation, which are privately held, publicly regulated water and wastewater utilities serving the greater Fairbanks area. Together, these two utilities provide service to more than 8,500 combined customer accounts representing a population of over 55,000.

The maps below show the boundaries of the two water/wastewater utility districts. While these utilities are outside the 99705 area, they are referenced here because the water and sewer service provided gives these service areas the capacity to support affordable small lot homes and rental apartments – housing types expected to be in demand as a result of the F-35 Beddown.

The Golden Heart district generally corresponds to the more developed portions of the City of Fairbanks. In the past, the Golden Heart utility boundary extended to the eastern limits of the City of Fairbanks, including Ft. Wainwright and a small section of the developed area along Badger Road. In 2009, the Golden Heart utility boundary contracted to the smaller area shown on the map. This action dropped areas that were in the Golden Heart boundary but served by a separate utility (Doyon serves Ft. Wainwright) or areas that never had received water and sewer service.¹⁸ The College Service District covers land on the west side of greater Fairbanks, covering areas outside city limits.¹⁹

According to interviews with FSW staff²⁰, both the water and sewer utilities have experienced declining consumption of utility services in recent years, and both have substantial surplus capacity and would welcome new demand. Expansion of water or sewer services to new areas, either outside current

boundaries or infill within, typically happens in one of three ways:

- Developers fund capital costs;
- Utility private investors fund expansion where there is clear evidence that sufficient demand exists to reasonably absorb the costs, and eventually make a profit from the investment; or
- The least common of the three options: agency funding is made available.

¹⁸ A final twist in this story: FSW had owned a 50% stake in the Ft. Wainwright water and sewer utility. The share is now owned by Corix, since 2009, the owner of FSW. Doyon controls the other 50 percent, and runs the utility.

¹⁹ Boundary information based on Utility Services of Alaska web site accessed August 8, 2017

²⁰ Interview with Roy Strandberg, PE, Engineering Manager, Utility Services of Alaska, April 17, 2018

FNSB Rural Services provides limited services in specific, limited locations, where property owners are willing to tax themselves for the service. One existing example is the Bailliane Lake Sewer & Water Rural Service District, which receives limited water and sewer services in the area north of the University of Alaska off Farmer’s Loop Road. There is also a small water service district, off the west end of Badger Road in Holmes Road area. This small-scale service district option may be relevant if there is interest in providing water or sewer outside of current service area boundaries, e.g., in the Badger Road area.

On Ft. Wainwright, Doyon Utilities operates the potable water distribution system, including treatment equipment, pumps, fire hydrants, meters, and distribution piping. Water wells are the source for all potable and non-potable water. There is no interconnection to water supplies from Golden Heart Utilities (GHU). Ft. Wainwright has 19 raw water supply wells, with two primary source wells for the water plant and two backup supply wells to the water plant. The Ft. Wainwright Wastewater system is also operated by Doyon Utilities. Wastewater flows through gravity collection lines to the southwest corner of the military reservation where it connects to a GHU lift station.

Water and wastewater treatment at EAFB is provided by on-base facilities operated by the Air Force. This includes pumped waste from individual septic systems which is treated at a treatment plant on base.

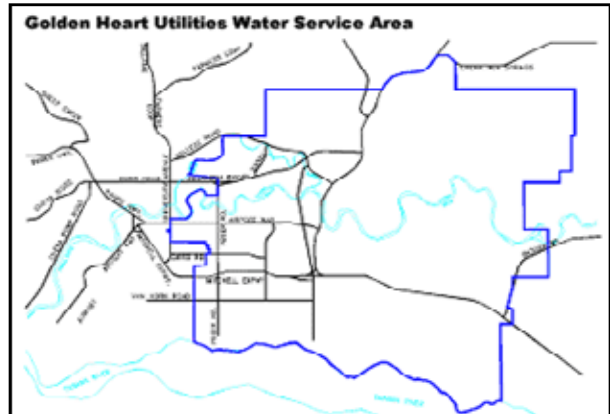


Figure 6 is from the Golden Heart Water Service area’s current website; Figure 6 shows what utility staff identified as the correct map, showing that Ft. Wainwright and adjoining areas have been dropped from the Service Area. The current Sewer Service Area follows essentially the same boundaries as the water service area.

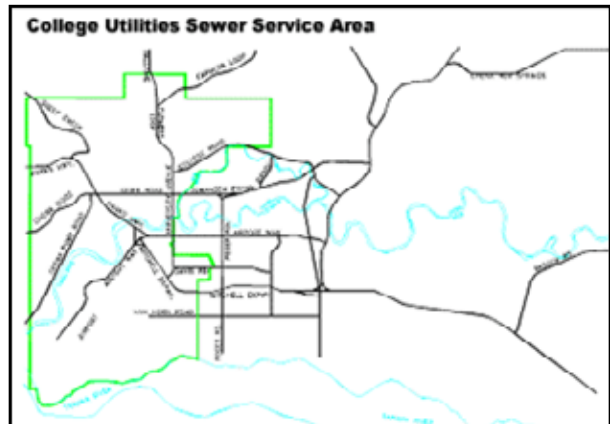
FIGURE 7: WATER AND SEWER SERVICE AREAS – EAST SIDE



FIGURE 8: WATER AND SEWER SERVICE AREAS – WEST SIDE



FIGURE 9: WATER AND SEWER SERVICE AREAS – WEST SIDE



Sources: Fairbanks Sewer & Water (FSW) website and Golden Heart Utilities

Telecommunications

While traditional land line telephone service demand has declined, demand continues to grow for cellular telephone and fast internet service throughout the borough. However, it is difficult for many new residents to determine what type of telecommunications services are available outside the more densely developed areas of the FNSB. Telecommunication services generally available are summarized below:

- Alaska Communications (ACS) has significant wired services in the FNSB, including the North Pole and Eielson areas. They are also a partner with Quintillion, a global fiber optic communications provider. ACS also has access to two high speed fiber optic cables that connect to the lower 48 states.
- General Communications, Inc (GCI) also has significant wired services in the borough. They recently completed significant new cable work in the North Pole area to improve access to their internet service. GCI also has two high speed fiber optic cables running south to connect to lower 48 states.
- Land line telephone is available through ACS and GCI for most of the more urbanized areas

of the borough. However, the specifics of that coverage are unclear, as coverage maps and land line locations are considered proprietary information. Consumers interested in land line service must contact ACS and GCI to determine service availability.

- Cellular telephone service is available in the FNSB. Primary providers include GCI, Verizon, and AT&T. Signal strength is generally good in Fairbanks and North Pole. It has been reported the quality of the signal connection dissipates in the Eielson and Salcha areas.
- Internet service via broadband providers ACS and GCI is available in most of the developed areas of the borough where electric power is available, however there are some residential areas where no internet service is available or connectivity is inconsistent, such as the Salcha area. In some cases, residents can sign up for satellite internet service from a service like HughesNet (see more below).

- Quintillion is a fiber optic communications provider that will provide FNSB residents higher speed internet access to Asian and European markets than is currently available. In Phase 1, ending October 2017, the Alaska connections were completed. Phase 2 will complete the fiber optic connection to Asia; Phase 3 will be the European connection. ACS also has fiber optic connection to the rest of

North American via two cables that are part of existing fiber infrastructure.

- HughesNet is a satellite internet provider with the ability to provide service to the developed areas south of Fox. The basic plan for service is about \$70/month with a 10 gigabyte limit. The top-of-the-line plan is about \$120/month with a 50 gigabyte limit. Data speed is 20 megabytes/second.²¹

²¹ HughesNet web site accessed 1/24/2018

FIGURE 10: MAP OF QUINTILLION ALASKA BASED CONNECTIONS



Flood Control

The Chena River Lakes Flood Control Project was constructed by the US Army Corp of Engineers (USACOE). This major infrastructure project, built in the 1970s, is designed to control Chena River flood waters which have a history of flooding Fairbanks and the surrounding area when summer rainfall is heavy. This project provides flood protection to Fairbanks and adjacent areas, including Ft. Wainwright. Major and minor work on the project continues to ensure it continues to handle major flooding.²²

The flood control project occupies about 20,000 acres of land southeast of the City of North Pole, in a federally owned area – the Chena Lake Recreation Area – designated for multiple use. The Recreation Area has grown steadily in its

²² US Army Corps of Engineers, Alaska District, Chena River Lakes Flood Control Project web site accessed 1/24/2018

“ Chena Lake Recreation Area is not what you might expect in Alaska’s Interior. It’s near Fairbanks and next to North Pole, yet remote enough to give you the feeling of wilderness.

2,100 acres to explore and enjoy!

The park has two distinct personalities; the Lake Park, with a 260-acre lake and the River Park meandering along 4 miles of the Chena River. ”

**- Fairbanks North Star Borough
Parks and Recreation**

popularity for recreation over the years, averaging 133,000 visitor days of use per year since 1993. See the Quality of Life chapter for more details on the many year-round outdoor opportunities in the area, a short 15-minute drive from Eielson Air Force Base.

Stormwater

For both practical and regulatory reasons, municipal governments develop policies and infrastructure to manage stormwater runoff. In the Fairbanks area, the cities of North Pole and Fairbanks, the University of Alaska Fairbanks, and the Alaska Department of Transportation & Public Facilities (ADOT&PF) are co-permittees in an Alaska Pollutant Discharge Elimination System (APDES) surface runoff permit. This permit, issued by the Alaska Department of Environmental Conservation (ADEC), sets standards for how public and private development will handle non-point source runoff from different types of development. The permittees were originally issued a National Pollutant Discharge Elimination System Permit from the U.S. Environmental Protection Agency; ADEC took over authority for the permit in October 2009²⁴

The North Pole Building Department handles stormwater permitting within the North Pole city limits, with a focus on larger scale projects where runoff could flow into significant public waterways. At present, the city does not have a piped stormwater system, and stormwater runoff is typically dealt with through on-site retention and infiltration.²⁵

²³ <https://www.northpolealaska.com/publicworks/page/storm-water-management-and-permitting>.

²⁴ Ibid

ESTIMATED GAPS – WHAT ARE THE GAPS BETWEEN NEEDS AND EXISTING PROGRAMS, SERVICES, INFRASTRUCTURE?

This section looks at how local utilities and infrastructure can meet existing and anticipated future demands for services with the growth expected with the F-35 Beddown.

While utilities and infrastructure are developed in some urbanized areas, demand for development is expected in areas that currently have limited utility options. Specific gaps to investigate include:

- Will the new dwellings built in the Greater North Pole area have adequate access to water and wastewater solutions – either public services or on-site?
- Does the electric supply for FNSB have sufficient capacity to absorb the F-35 population?
- Internet and cellular telephone services can be limited in the Eielson/Salcha area. With addition of the new Air Force families will cellular access grow with the demand in the Eielson/Salcha area?²⁵
- How can improved utilities help minimize the air quality impacts of new growth?
- As is made clear in other chapters of this report, planning for new growth and addressing the issues above, requires integrating thinking on utilities, transportation, land use and other public policy topics.

Water and Wastewater

State and local regulations set standards that control use of on-site wells and/or septic tanks where these systems are relied upon for water and wastewater disposal. Where on site solutions are used, parcels must be at least 40,000 square feet (just under an acre), provide for adequate spacing between wells and septic systems, and the ground must be sufficiently well drained to meet percolation test standards. The pattern of development in the Greater North Pole area – including the mix of undeveloped land and low density residential areas – reflects these standards, along with the large areas of poorly drained soils, and the desire by many people for a more rural residential setting. Where served by public water (but not sewer), lots can be subdivided to half the size of lots with neither public water nor sewer, that is, lots with just public water can be as small as 20,000 square feet.

The upcoming Salcha-Badger Road Subarea Plan will provide the opportunity to look in detail at the supply of land and existing development available to meet growth associated with the F-35 Beddown. The plan will investigate how this supply matches the amount and types of housing new residents want and can afford.

²⁵ Discussions at the 6/7/ 2017 meeting with Air Force members at Eielson and the Salcha Community meeting 8/14/2017 meeting at Salcha.

Preliminary expectations regarding categories of demand for housing, and the implications of this demand for water and sewer service are below:

1. Development within City of North Pole boundaries in areas that have public water and/or sewer.
 - Implication: adds to the demand on the existing system, and creates hook-up fees and new property tax revenues.
2. Development within City limits on property without public water and sewer.
 - Implication: developers are required to cover costs of extending water/sewer lines to serve these new uses.
3. Development in areas that will or may be served by the extension of city water tied to the two groundwater contamination issues described earlier, one within City of North Pole limits, one in the Moose Creek area.
 - Implication: growth in these areas facilitated by the availability of public water will add to the demand on the city water system; for the City of North Pole serving a broader population base creates economies of scale that can help reduce service costs per household citywide.
4. Pressure for development in the Badger Road area beyond the sulfolane plume contamination project, and northeast of the boundaries of the City of North Pole.
 - Implication: this could create incentives to consider further expansion of water and sewer in these areas.

Interviews with City of North Pole²⁶ officials establish the City has sufficient well water reserves to meet anticipated demands from infill growth within city boundaries, and the addition of new demand associated with the sulfolane area water system expansion. Additional growth beyond those two areas may require expansion of water supply and/or wastewater treatment capacities. Expanding water system supply, for example, might include greater pumping or water filtration capacity, or ultimately drilling additional wells.

A fundamental challenge for the City of North Pole, the Borough, other area utilities, and developers, is the reality that providing public water and sewer typically creates development costs that exceed what the market will buy.

Higher density development has many long-term advantages, but in the near term, it is cost prohibitive for developers to put in the water and sewer needed for higher density projects. We're working to find new ways to address that challenge. ”

- City of North Pole Mayor,
Bryce Ward

²⁶ Telephone interview with Mayor Bryce Ward, 4/16/18

Electric Supply

A GVEA engineer interviewed for this project explained that GVEA has substantial capacity and can readily support the relatively modest additional increment of demand associated with expected regional growth, including growth tied to the F-35 Beddown. The only issue raised was the need for adequate lead time on requests for connections. If a single project will require more than 20 connections, GVEA requires a request be planned well ahead of the needed service.²⁷

Cellular Telephone Service

While cellular service providers indicate there is adequate coverage in the Eielson/Salcha area, civilian and military personnel have indicated the cellular service is not consistent. There are no specific current plans for additional cellular transmission towers in this area, however, new cellular service tower(s) could be in place under the AT&T FirstNet program.²⁸ The FirstNet network helps ensure first responders and the public safety community have access to the interoperable communications and technologies to more efficiently and quickly coordinate responses to emergencies. FirstNet is not expected to be available in Alaska until at least 2022. Additional housing developed in a concentrated, underserved area might trigger internet and cell service providers to bring more transmission capabilities to the area.

Natural Gas

The Greater North Pole area would clearly benefit from the availability of natural gas. Focus groups, interviews, and surveys done in the early stages of the IGU planning process and during the City of North Pole Strategic Planning process found many area residents contacted wanted natural gas, and were willing to pay for connecting their homes with some incentive. The availability of a cleaner source of heating fuel will also provide a needed means to reduce the PM 2.5 emissions problem the FNSB experiences during the winter.

The IGU plan for expanding natural gas service, with a target of providing natural gas in North Pole by the 2020 - 2021 winter season, will further promote this area as a prime location for new housing for the F-35 Beddown.

²⁷ Interview with GVEA engineer Richard Possenti 10/18/2017

²⁸ Interview with FECC Supervisor Stephanie Johnson 10/18/2017

UTILITIES AND INFRASTRUCTURE STRATEGIES – WHAT ARE OUR RECOMMENDED SOLUTIONS FOR MEETING ANTICIPATED GAPS?

UI1. Integrate planning for land use, transportation and utilities.

The Transportation and Planning and Zoning chapters make the same recommendation relevant for utilities, that is, there is a need for more robust, integrated planning of the amount, location and character of growth, to meet the goals and needs of both existing and new residents. A specific suggested approach, referencing what is included in those chapters, is below:

- a. The Salcha-Badger Road Subarea Plan, currently in progress, will provide the detailed planning needed to refine site-specific, local-scale land use, transportation and utility needs. Tasks to be carried out through that process plan include:
 - i. Develop land use and related infrastructure plans to meet demands for F-35 related growth. Building from the policy direction in the City of North Pole Strategic Plan, evaluate the supply of land available to meet growth needs, including areas that today or might in the future have public water and/or sewer. Identify potential community benefits and challenges tied to the locations and character of that expected growth, considering for example, prospects for improved water, sewer and

other infrastructure; the need to provide for quality, affordable rental housing; strategies to minimize adverse impacts on existing neighborhoods; and strategies to minimize impacts on air quality.

- b. Where helpful, use the Salcha-Badger Road Subarea Plan to inform changes in other sub-areas of the borough or even borough-wide.

UI2. Identify and implement funding strategies for expanding water and wastewater service areas and distribution systems.

If the goal is providing opportunities for more concentrated, affordable and walkable places to live, supporting water and sewer improvements is a critical need. A substantial portion of the growth associated with the F-35 Beddown will be seeking quality, multi-family rental housing, or smaller lot, more affordable single family detached housing; both require public water and sewer. While providing water and sewer brings those benefits, expanding or building new water and sewer lines is costly, and there are few funding resources outside of those generated at the local level. An additional challenge for the City of North Pole is the reduction in local property tax revenue following the closure of the Flint Hills refinery.

Possible options to reduce water and sewer costs and/or find new approaches to funding water and sewer include:

- a. **Starting Place: Community Support.** Active public support will be needed for the following funding strategies to move forward. Building that support will require education and outreach programs that allow for informed discussion of the benefits and costs of utility improvements. A particular need will be helping the public understand

how increasing densities – something many Alaskans hesitate to support – can translate into improved services, more open space and cost savings. More suggestions for outreach and educational programs are presented in the Planning and Zoning and Transportation chapters.

b. Local Cost Reduction and Financing Strategies.

The City of North Pole and the FNSB are together investigating new ways to reduce the cost of providing water and sewer. Some of ideas to reach this goal include:

- i. New strategies to reduce the number of lift stations required to serve any given collection of households. This might be done, for example, by installing force mains that double the number of residents served by a single life station.
- ii. Identify solutions to challenges faced by developers who must cover 100 percent of upfront capital costs, but will be paid back only slowly as a subdivision builds out.
- iii. Use zoning and other land use policies to allow for and encourage more mixed use projects, for example a combination of commercial uses and multifamily residential. The higher value commercial properties can help create revenues that justify investments in water and sewer systems.
- iv. Develop the capacity for Tax Increment Financing (TIF) which allows a community to funnel the growth in tax revenues resulting from a new development, to pay off loans used to finance up front utility and infrastructure development costs. This is a widely used strategy for redevelopment outside of Alaska, but requires changes in local and statewide statutes. Fairbanks, North Pole, Anchorage, Juneau and other cities

in Alaska are all working on this issue, and should coordinate their efforts for maximum impact.

c. Funding from the State of Alaska

Until recent years, the State of Alaska was a regular source of capital project funding. The State’s current fiscal challenges have led to dramatic reductions in capital budgets. While local governments cannot bring back the oil revenues that long buoyed State spending, FNSB municipalities, businesses and residents can work aggressively with the Alaska Legislature, especially FNSB representatives, to find new ways for the State of Alaska to generate revenues to support a robust state capital improvements budget, which can in turn help fund and local community infrastructure needs. The crux of this strategy requires finding ways to replace the revenues previously generated by oil production.

d. Other Funding Option. Listed below are funding options the Borough and the cities of North Pole and Fairbanks should investigate, to the degree the public and elected leadership rallies behind these options. Notably, each of the options likely requires support from parties beyond the direct control of Borough and City leadership – either voters, EAFB or the State Legislature.

- i. For the City of North Pole, take advantage of the corrective work for the Moose Creek area groundwater contamination, and partner with the Air Force and EAFB leadership to support linking the Moose Creek area to the City’s water utility. The North Pole City Council has already passed a resolution of support for this option. More work is needed to further explain how this option not only offers an enduring solution for Moose Creek, but also provides economies of scale for utility operations.

- ii. To date, resolution of the sulfolane and Moose Creek area groundwater issues have limited solutions to only the specific areas affected by the contamination. The City of North Pole, FNSB, EAFB, and the State should pause to identify if these narrowly defined expansions might be broadened. While it is not a simple process, an incremental increase in the capacity of these systems could provide a cost-effective way to bring water service to areas that could support future growth, including growth linked to the F-35 Beddown.
- iii. For the City of Fairbanks, work with Fairbanks Sewer & Water and its subsidiary Golden Heart Utilities to understand the costs and benefits of expanding water and sewer service into areas east of current utility boundaries, along the Badger Road corridor.
- iv. For both the City of North Pole and the City of Fairbanks, consider options for expanding City boundaries, as part of the process of offering more services while generating property tax from a larger pool of properties.
- v. Develop and gain approval from FNSB voters for regional bond measures to help meet regional utility needs. If the State of Alaska's fiscal situation improves and there are improved prospects for funding from the State for utility projects, use local bond approvals as a means of leveraging and competing for limited State funds.
- vi. Statewide General Obligation bonds are likely to emerge as a strategy for funding major capital projects in Alaska. If this moves forward, develop regionally significant infrastructure projects to be added to the statewide bond measure(s).



UI3. Work with private cell providers to improve cell phone reception.

The Borough, the cities of North Pole and Fairbanks, and EAFB, should band together to work with private cell service providers to improve cell phone reception in areas where service is currently spotty. The Borough should take the first step and conduct some relatively simple research to identify the areas where service is poor or non-existent. With this information in hand, coupled with a combination of what is known about current and prospective development patterns, the partners referenced above should work with the private sector providers on a plan for incrementally improving service in areas where the need is greatest. Given these providers are private sector businesses, this may require actions like streamlined permitting, below market rate leases on land for towers, some form of financial assistance, or perhaps just the chance for some valuable publicity (a chance for these providers to get credit for “doing our part to welcome the F-35 team to our communities and make the area a safe and enjoyable place to live”).

UI4. Build from the work of the Alaska Broadband Task Force, Arctic Council and best practices to develop reliable broadband connectivity in the Salcha-Badger Road area.

Potentially create rural broadband coops or make strategic use of public infrastructure to create connections where there are none, and improve consistency where connectivity is unpredictable and a barrier to quality of life. See www.heyfairbanks.net for additional potential solutions.

UI5. Use utility and land use planning to support air quality solutions.

See the Planning and Zoning chapter for a thorough discussion on air quality issues, and the direct link between land use, utilities, transportation and air quality.

FNSB needs practical, effective and long-term solutions to its significant air quality problems. Most of these issues come from emissions from heating buildings. Attached multi-family housing generally is more energy efficient than detached housing, and the availability of public water and sewer is almost always necessary to build such housing.

The summary version of what is presented in the Planning and Zoning chapter is this: developing land use and associated utility policies that encourage more concentrated development, more attached housing, and more walkable mixed use development patterns helps address air quality issues in two ways:

1. Attached housing will help create more energy efficient buildings, because of shared walls;
2. More concentrated, mixed use districts will help reduce driving, which is also a contributor to air quality issues in the borough.²⁹

In making plans for improved air quality, the Borough and the cities of North Pole and Fairbanks should investigate options for improving utilities to reach this goal.

²⁹ The community of Whitehorse in the Yukon Territories, Canada is a good example of a community that shows how the length and number of driving trips can be reduced – even in a very cold climate – with a concentrated, mixed use, walkable downtown.