

Engineering Report

# CITY OF DONALD

## WASTEWATER FACILITIES PLAN UPDATE

Marion County, Oregon



*This project was funded in part with a financial award from the Water Fund, funded by the Oregon State Lottery and administered by the State of Oregon, Business Development Department.*

June 2019

CURRAN-McLEOD, INC., Consulting Engineers  
6655 SW Hampton Street, Suite 210  
Portland, OR 97223





**CITY OF DONALD**  
**WASTEWATER FACILITIES**  
**PLAN UPDATE**

Marion County, Oregon



Exp 12/2020

Adopted July 9, 2019  
Donald Resolution 485-19

June 2019

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Portland, Oregon 97223





# Oregon

Kate Brown, Governor

## Department of Environmental Quality

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June 25, 2019

Heidi Bell, City Manager  
City of Donald  
P.O. Box 388  
Donald, OR 97020

RE: Donald Wastewater Facilities Plan Approval  
File No.24600  
Marion County

Dear Ms. Bell:

We have reviewed the final Wastewater Facilities Plan prepared by Curran-McLeod, Inc. received in our office May 31, 2019. Additional revisions were received June 20, 2019. The revised document addresses all our comments as per our letter of May 16, 2019. Therefore, we are approving the document.

The next step is to start pre-design work. To avoid extra work and cost overruns, the City should not authorize final design until a pre-design report is reviewed and agreed on by City staff and DEQ.

Should the implementation of the proposed alternatives in the facilities plan lapse over five years, we strongly recommend that you consult with DEQ staff to ensure that the proposed plan and issues are still relevant. It is sometimes possible that preparation of a new document may be warranted after five years.

Please feel free to call me at [541] 687-7341 should you have any questions or comments.

Sincerely,

Jaime Isaza, Project Officer

ec: Alonso Limones, Donald Public Works Director  
Curt McLeod  
Dave Belyea, Tim McFetridge - DEQ

ji: Donald FP 2019 app.docx



**DONALD, OREGON  
WASTEWATER FACILITIES PLAN UPDATE**

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## LIST OF ACRONYMS

ac ft	Acre Feet	OAR	Oregon Administrative Rules
BOD	Biochemical Oxygen Demand	OCDD	Business Oregon, Community Development Department
CY	Cubic Yard	OHCS	Oregon Housing & Community Services
DEQ	Dept of Environmental Quality	ORS	Oregon Revised Statutes
Ea	Each	PVC	Polyvinyl Chloride
EDU	Equivalent Dwelling Units	lbs/d	Pounds per Day
EFU	Exclusive Farm Use	psi	Pounds per Square Inch
FY	Fiscal Year	SY	Square Yard
gpd	Gallons per Day	SCADA	Supervisory Control & Data Acquisition
gpm	Gallons per Minute	SDC	System Development Charge
GO	General Obligation	STEG	Septic Tank Effluent Gravity
HDPE	High Density Polyethylene	STEP	Septic Tank Effluent Pump
I/I	Infiltration & Inflow	TSS	Total Suspended Solids
ID	Interchange Development	USDA	United States Department of Agriculture
ISD	Interchange Service District	UGB	Urban Growth Boundary
LF	Lineal Foot	WWTP	Wastewater Treatment Plant
LS	Lump Sum	WPCF	Water Pollution Control Facility
mg/L	Milligrams per Liter	WTP	Water Treatment Plant
mL	Milliliters		
MGD	Million Gallons per Day		
MG	Million Gallons		



# City of Donald

## WASTEWATER FACILITIES PLAN UPDATE

### I. EXECUTIVE SUMMARY

The City of Donald is a rural community of 985 residents located in the northern region of Marion County. The City's wastewater collection system is a Septic Tank Effluent Pumping (STEP) system, with facultative lagoon treatment and storage. Effluent is stored through the wet weather period and recycled for beneficial use. There is no permitted discharge to surface waters.

The system was constructed in 1983 for a design population of 1,030 residents anticipated at the year 2000. The City is only now approaching the design population and the wastewater system is nearing capacity of 140 pounds per day of total solids.

The population of the City of Donald has not increased materially since 2010 due to limited areas for development. The City expanded the Urban Growth Boundary in 2018, which is anticipated to prompt residential growth.

This Facilities Planning Update is intended to evaluate the existing wastewater impacts from the community, and the capacity of the existing collection, treatment and recycle systems in order to quantify future requirements. The report includes a summary of existing flows, an evaluation of the condition and capacity of each system component, and a Capital Improvement Plan to provide services to serve a planning window to the year 2040.

The City currently operates all facilities within the limits of the Oregon Department of Environmental Quality Water Pollution Control Permit. With growth of the community, the City will need to expand the collection, treatment, storage and irrigation facilities to remain in permit compliance.

#### A. Population Growth and Wastewater Loading

The population history and projections were provided by the Portland State University College of Urban & Public Affairs, Population Research Center. The planning window for this Wastewater Facility Plan Update is through the year 2040, when the population is projected to reach 1,705 residents.

An analysis of existing system flows indicates the average annual STEP system flow is 64,000 gallons per day, or 65 gallons per capita per day. Based on the 2040 population of 1,705 residents, the wastewater flows to the City's lagoons are projected to increase to an average annual flow of 110,825 gallons per day (gpd), which accounts for an increase of approximately 47,000 gallons per day.

Biochemical Oxygen Demand (BOD) loading is projected to be 140 pounds per day, and Total Suspended Solids (TSS) loading at 70 pounds per day, each of which are easily treated with the existing lagoon system.

In addition, the City of Donald operates a wastewater lagoon constructed for the Fargo Interchange Service District (Fargo ISD) and incorporates the treated effluent into the City's recycle irrigation system.

The Fargo ISD is nearing build-out of all developable lands. The conventional gravity collection system flows are anticipated to reach maximum build-out in the next few years at an average flow of 51,000 gpd at 250 mg/L organic and solids loading concentration. Fargo ISD buildout BOD and TSS loading is approximately 106 pounds per day each.

## **B. System Capacity and Deficiencies**

The existing Donald collection system is comprised of small diameter pressurized pipelines from 2" to 6" diameter, that have sufficient capacity to accommodate flow through the planning window.

The City's treatment and storage lagoons have sufficient capacity for the current population, but only have the capacity to accommodate a very limited increase in population, i.e., approximately 75 additional residents. The current average annual flow is estimated at 64,000 gpd, with capacity calculated to be an average 68,800 gpd.

Utilizing all 56 acres of City property available for effluent irrigation, the system is adequate for the current demands, but is nearly at capacity. The irrigation site can accommodate an average annual flow of 128-ac ft, or approximately 150 additional population over the current irrigated volume of approximately 117 acre feet (ac ft).

The Fargo ISD lagoon is adequate to meet the current treatment requirements but deficient in storage. The lagoon has a capacity to accommodate an average annual flow of 44,600 gpd, and the current flows are estimated to be an average of 46,800 gpd. The current 38.1 ac ft of wet weather storage in Lagoon 4 is deficient to accommodate the current flow and will be deficient by 4.3 ac ft upon build-out of the interchange zoned area, anticipated in the next few years.

## **C. Evaluation of System Alternatives**

In 1981, the City of Donald adopted an Amended Sewerage Facilities Plan that proposed the use of a STEP system of small diameter pressurized pipelines for the collection system, facultative lagoons for treatment and storage of the City's wastewater, and irrigation for effluent recycle. The critical element of this system is the volume of storage required to avoid prohibited discharge to any surface waters.



The use of an alternative collection system design is not viable due to the current collection system design. Future collection system expansion must use pressurized force mains to be compatible with the existing system.

The potential of utilizing any alternative treatment system could impact treated water quality but would not address the critical element of the lagoon design; the volume of storage. The lagoons currently meet all permit limitations and, with construction of an additional lagoon, will easily meet future treatment requirements. The evaluation of alternative treatment processes is not applicable to the City.

Due to the requirement for winter storage and summer irrigation, and prohibited discharge to surface waters, continuing the use of facultative lagoons and irrigation recycle is the only cost-effective solution for the City. Continuing the current treatment, storage and recycle practices is easily the most cost-effective option for the City.

#### **D. Recommended Improvements**

The Capital Improvement Plan includes six items required to support growth through a projected population of 1,705 residents. Projects are grouped to be short term, anticipated to be completed within 5 years as funding allows, or long-term, anticipated to be required anytime within the 20-year planning window when warranted:

##### **1. 10-Acre Lagoon Number 5 Construction, 1 - 5 years, Estimated Cost \$1,645,000:**

This project is for a new lagoon to provide an additional 39.6 acre-feet of storage. The lagoon liner type will be determined during the design, but is anticipated to be a bentonite design, similar to the existing City lagoons.

##### **2. Effluent Disinfection System Improvements, 1 - 5 years, Estimated Cost \$12,000:**

This project includes housekeeping improvements to include a spill containment basin and a scale for monitoring chlorine use within the existing chlorination building.

##### **3. Effluent Recycle Pump Station Improvements, 1 - 5 years, Estimated Cost \$70,000:**

This project is to increase the capacity of the recycle pumping station to include a second irrigation pump and improvements to more easily access the suction strainer.

##### **4. Irrigation Site Expansion, 1 - 5 years, Estimated Cost \$470,000:**

To provide sufficient area for effluent irrigation through the planning window will require an additional 35 acres of farmland. This is to provide a minimum net 19 acres of irrigated site, accounting for the approximate 12 - 15 acres of existing irrigation fields that will be lost to the new lagoon construction and required buffers. This cost estimate only includes the cost of constructing one mile of 6" force main and updated Recycled Water Use Plan, assuming the City can locate an acceptable site within one mile of the existing lagoon site.

**5. Instrumentation & Controls SCADA Improvements, 1 - 5 years, Est. Cost \$25,000:**

This project is intended to be completed in conjunction with a \$60,000 Supervisory Control and Data Acquisition (SCADA) improvement designated for the Water Treatment Plant (WTP). The WTP facility has extensive processes to monitor and potentially control remotely. As a result, the SCADA hub will be located at the WTP with a remote terminal at the Wastewater Plant.

The project includes installing and programming the remote terminal at the Wastewater Treatment Plant (WWTP), to monitor operational and alarm conditions at the treatment and irrigation facility with the provision of making control modifications or identifying and acknowledging alarm conditions remotely.

**6. Planning and SDC Updates, 1 - 20 years, Estimated Cost \$40,000:**

This project is to account for the cost of maintaining a current Facilities Plan and System Development Charge (SDC) methodology over the next 20 years. The Master Plan and SDC methodology should be revisited every five years, and the SDC fees adjusted annually.

A summary of all recommended capital improvements is listed in the following table:

**Table I-1: City of Donald  
Capital Improvement Plan Summary**

No.	Project	1 - 5 Years	1-20 Years
1	Lagoon No. 5	\$1,645,000	
2	Effluent Disinfection	\$12,000	
3	Recycle Pump Station	\$70,000	
4	Recycle Irrigation Site*	\$470,000	
5	SCADA System	\$25,000	
6	Planning & SDC Updates		\$40,000
	TOTAL	\$2,222,000	\$40,000

*\*Effluent irrigation site costs are based on one mile of force main. Irrigation sites are anticipated to be leased from local landowners who can develop a beneficial use for the recycled water. If the City purchases land, the land cost would be in addition to the costs estimated above.*

**E. Recommended Funding Program**

A summary of all 1 - 5-year capital improvements totals \$2,222,000. The City has received a Workforce Housing Initiative grant from the Oregon Housing and Community Services Department (OHCS) that will offset a portion of the cost for preliminary engineering design of the needed improvements and to apply to a portion of the construction cost.

The joint application submitted to the Oregon Housing and Community Services by the City of Donald and GK Machine, Inc. (GGP, LLC) proposed to complete the infrastructure construction as a public/private cooperative arrangement, with GK Machine, Inc. completing the construction as an SDC eligible public improvement. The City in exchange would provide an SDC credit to GK Machine, Inc. for the cost of the improvements. This credit would offset SDC fees for development of new residential homes in the newly annexed land in the SE quadrant of the City. The SDC credit at the current SDC fees could generate funding of approximately \$1,575,000.

Alternatively, the City can generate a funding program through several governmental resources. An estimated \$266,440 of the capital costs is the responsibility of the Fargo ISD for improvements to accommodate their wastewater flow. Securing the remaining funding requirement with General Obligation bonds would result in a cost of approximately \$1.04 per \$1,000 assessed value, plus the cost of issuing the bonds. Securing the required funding with a revenue backed loan would result in an increase in user fees of approximately \$18.85 per month per EDU, plus the cost of issuing the debt.

With a funding source other than the public/private SDC credit option, the SDC revenues from any new development would be available to service the debt. However, SDC revenues are dependent upon development. If development does not occur, SDC revenues would obviously be limited.

The capital improvements to the wastewater system should be scheduled for construction in the spring of 2022 to allow for the harvest of the current nursery stock on site.



# City of Donald

## WASTEWATER FACILITIES PLAN UPDATE

### II. INTRODUCTION

#### A. Background

The City of Donald in Marion County first adopted a Sewerage Facilities Plan in 1979 to address contamination of the local surface water streams from the failure of subsurface disposal systems. That plan was amended in 1981 to further refine the wastewater needs, and resulted in construction of a collection system utilizing a Septic Tank Effluent Pump (STEP) collection system, and facultative lagoon treatment, with on-site irrigation recycle.

This system includes a septic tank at each property with a pump to discharge the wastewater to the lagoon site. The collection system is comprised of small-diameter force mains, from 3" to 6" diameter High Density Polyethylene Pipe (HDPE). The lagoon site includes a primary and secondary cell, each 2.5 acres, and a third 5-acre storage cell, each shown on Figure 3-B. Effluent is required to be stored in the winter wet weather months, and irrigated in the summer dry weather period. The system was constructed in 1983. There is no permitted discharge to surface waters.

Additionally, the City of Donald accepts wastewater under contract from the Fargo Interchange Service District (Fargo ISD), a rural Marion County wastewater service district. This district serves the Interchange Development (ID) zoned lands at the Donald exit of Interstate 5, which is shown in Figure 3-C. The Fargo ISD system includes conventional gravity sewers, a main pump station and 6" PVC force main, and a 5-acre lagoon (No. 4) located on the City property immediately east of the City's lagoons. Wastewater is treated in the facultative lagoon No. 4 and discharged into the City's storage lagoon No. 3, prior to being irrigated as a component of the City's effluent.

The Fargo Interchange Service District first contracted for the City of Donald to accept their wastewater in 1993. Subsequently, Marion County constructed Lagoon No. 4 adjacent to the City's Lagoon No. 2 in 2007, dedicated exclusively to serve the Fargo ISD.

The City of Donald has expanded the Urban Growth Boundary once in 2008 and completed the second expansion in 2018. These expansions added 38.24 acres of commercial industrial lands in 2008 and added 87.6 acres of residential and public facility land in 2018.

This facility plan update provides support information to better ensure that the planning and infrastructure will be in-place when needed to serve the community.

#### B. Study Purpose & Need

The City's existing wastewater collection, treatment, and land application facilities are nearly 35 years old and are operating near capacity. The 1981 Amended Sewerage Facilities Plan and the 1983 facility design were based on a design population in the year 2000 of 1,030. The City is only now, in 2018, approaching this population, and thus approaching capacity of the wastewater treatment and irrigation systems.

Per the Water Pollution Control Facility (WPCF) permit issued by the Oregon Department of Environmental Quality (DEQ), the City of Donald is prohibited from discharging wastewater effluent to any surface waters of the State. As a result, wastewater must be stored during the wet weather months for land application in the dry months. Storage volume is the critical need and organic treatment is easily achieved in the process.

This planning update addresses all aspects of a Facility Plan that are applicable to the City's system. This plan supports continued use of facultative lagoon treatment and effluent recycle, as any other treatment option would not address the need for the only critical element, wet weather storage. Similarly, this update has discounted the option of using a conventional gravity collection system due to the extent of the current small diameter force main collection system.

The continued use of the STEP collection system, lagoon treatment and land application process is very feasible and cost effective for the City of Donald. The resulting objectives of this Wastewater Facilities Plan Update are:

- Project growth and identify need for wastewater collection and treatment capacity;
- Determine water quality requirements for continued compliance with the Water Pollution Control Facility (WPCF) permit;
- Identify any deficiencies that limit growth or impact water quality; and
- Determine system upgrade requirements, costs and funding options.

### **III. PROJECT PLANNING**

#### **A. Location**

The City of Donald is located in Marion County, approximately 25 miles north of the City of Salem and 1 mile west of Interstate 5 at the Donald/Fargo exit. The City has a current population of approximately 985 and approximately 404 active residential and commercial/industrial wastewater connections.

The wastewater collection and treatment system will serve all land within the current Urban Growth Boundary, including 87.6 acres that were annexed in 2018. Figure 3-A below shows the Urban Growth Boundary (UGB) of the City of Donald, including the recent UGB expansion.

The existing Wastewater Treatment Lagoons are located on City-owned property outside of the current UGB, on land zoned as Exclusive Farm Use (EFU) as shown in Figure 3-B at the end of this Section.

The City of Donald also accepts sanitary sewage from the Fargo Interchange Service District (Fargo ISD) area under contract with Marion County. The Fargo ISD boundary is shown in Figures 3-C and 3-D. The service area and wastewater flow information for the Fargo ISD was provided by Marion County for inclusion in the scope of this planning update. This area is essentially land-locked and not anticipated to increase beyond buildout of the remaining buildable lands.

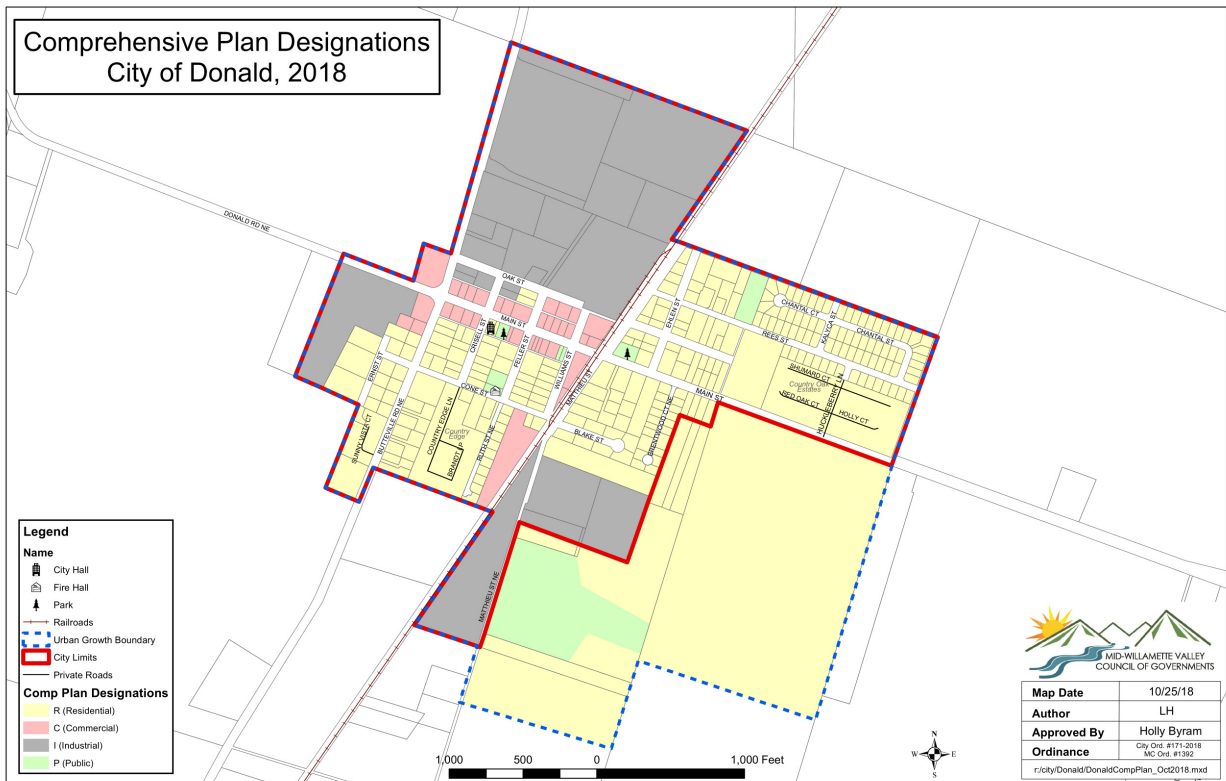


Figure 3-A. Donald Urban Growth Boundary

The City of Donald is located at an elevation of approximately 190 to 200 feet throughout the UGB, with very little change in elevation. Figure 3-E shows the topography of the area in and around the City of Donald. West of the UGB the topography generally slopes down to the existing lagoon site, to an elevation of approximately 175 feet at the western boundary.

## B. Environmental Resources Present

The environmental conditions in the City of Donald were well documented in the March 1981 Amended original Sewerage Facilities Plan and are still applicable today. A general overview includes:

### 1. Climate

The Climate in Donald is mild as being located in the middle of the Willamette Valley. The average high temperature is in the low 80's in July and August, with the winter lows averaging 35 degrees in December. The area experiences approximately 120 days of rainfall a year, averaging a total of 40 to 45 inches. USDA information indicates the area experiences average annual air temperatures of 52 to 54 degrees, and 190 to 210 frost-free days per year.

Statewide climate models addressing climate change in the 2015 *Oregon Natural Hazards Mitigation Plan*, project warmer, drier summers with reduced precipitation in the future.

## **2. Soils**

The USDA Natural Resources Conservation Service has categorized all soils in the Donald area as high value farmland, and includes predominately the Woodburn Silt Loam (WuA) with smaller percentages of Amity Silt Loam (Am), and limited areas of Dayton Silt Loam (Da) located typically adjacent to drainage ways.

The wastewater lagoons are located outside of the existing Urban Growth Boundary primarily on the Woodburn Silt Loam, which are considered the highest value prime farmland soils. These soils are described as moderately well drained with a surface area of dark silty loam, and subsurface of silty clay extending down approximately 70". The soils in the lagoon irrigation area have permeability of approximately 0.3 inches per hour.

## **3. Water Resources**

There are no significant surface waters within the Donald UGB. The municipal water supply is derived from two groundwater wells located in the northeast quadrant of the City at the Water Treatment Plant site on Rees Street.

There are two general drainage basins. The area east of the railroad drains easterly to Senegal Creek, which drains northeasterly to Mill Creek, which in-turn discharges northerly into the Pudding River. The area west of the railroad generally drains west to Ryan Creek, which drains northwesterly into the Willamette River.

## **4. Vegetation**

The 1981 plan identified a variety of crops that can be grown in and around Donald, including cereal grains, wheat, oats, barley, pasture grass, hay, grass seed, fruit and nut orchards, and berries.

Flora species found in the area on non-cultivated land includes: Douglas Fir, Cottonwood, Big Leaf Maple, Oregon White Oak, Willow, Vine Maple, Ash, Rose, Hazel, Wild Blackberry, Tussock, Shrubs, Poison-Oak, Oatgrass, Sword Fern, and Bracken Fern.

## **5. Socioeconomic Conditions**

The residents of the City of Donald have a median household income of \$63,889 in 2017. According to the US Census Data, an estimated 10.7% of the residents earn below the poverty level. The median age of the residents is 38.9 with approximately 10% older than 65 years.

Over the past few years, the City of Donald has experienced substantial industrial development with associated job creation. GK Machine and the Donald Industrial Park have created new job opportunities and increased demand for housing, but are challenged to find qualified employees.



The City currently has very limited housing to accommodate new employees. In 2017 the State of Oregon recognized this problem, which is common to many communities throughout Oregon, and established a Housing Workforce Initiative to address this issue. The public-private partnership of the City of Donald and GK Machine, Inc. were selected to receive \$770,000 in funding to assist in construction of up to 95 homes with associated improvements to the water and wastewater support systems.

This project will ultimately result in development of new homes within the City of Donald by the year 2034. The project aims to address affordable housing to increase the local workforce.

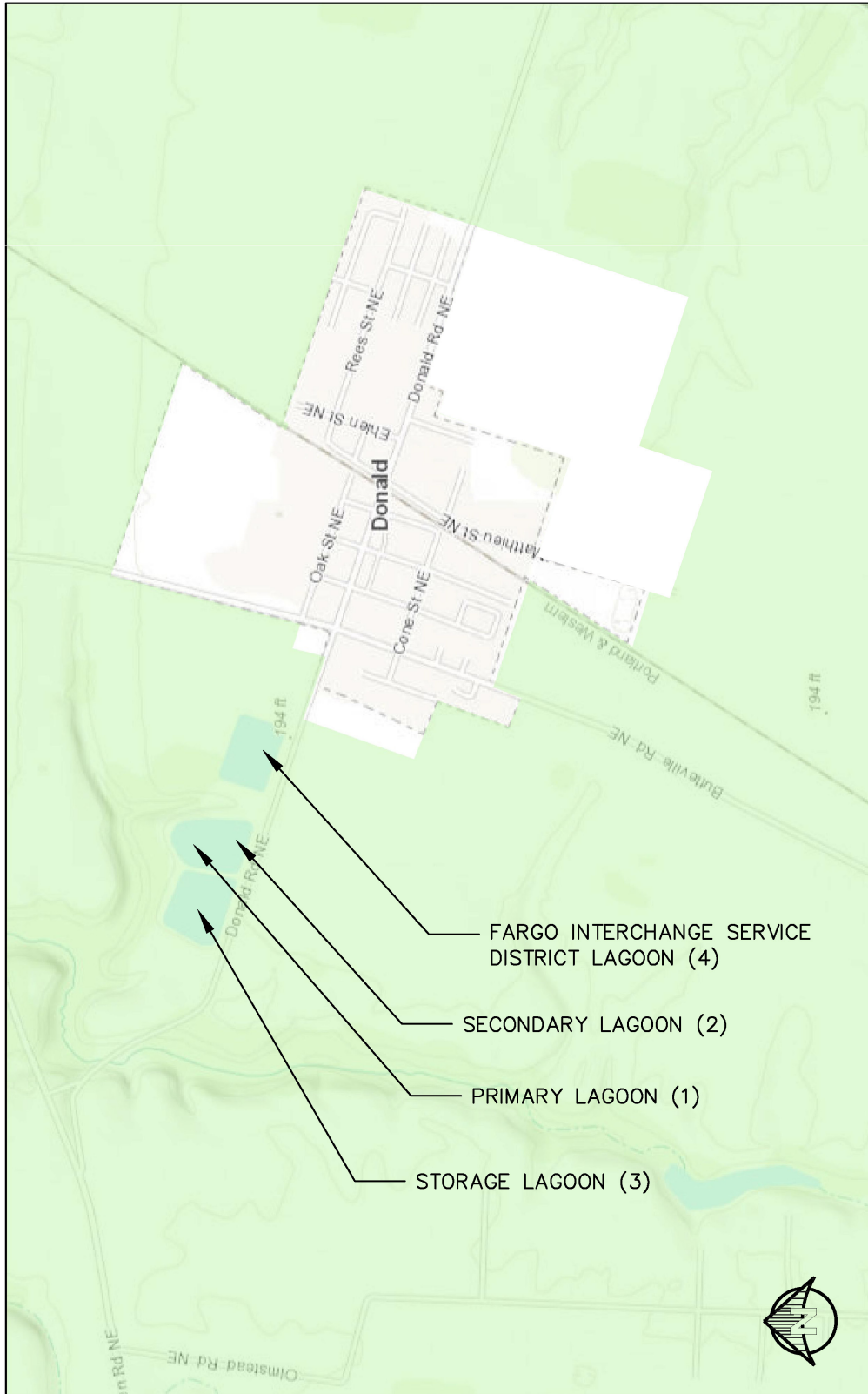
### C. Population Trends

The population history and projections were provided by the Portland State University, College of Urban & Public Affairs, Population Research Center. The following table lists the historical population through 2018. In 2018, state statutes and the DEQ wastewater planning guidance document mandated that all population projections be prepared by Portland State University Center for Population research. The PSU population projections for the Donald UGB through the planning window of 2040 are listed in the following table:

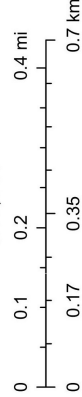
**Table III - 1: City of Donald  
Population History & Projections**

<i>Year</i>	<i>Population</i>	<i>Annual Growth</i>
1980	267	
1990	316	1.7%
2000	612	6.8%
2010	980	4.8%
2011	980	0%
2012	980	0%
2013	980	0%
2014	975	-0.5%
2015	980	0.5%
2016	985	0.5%
2017	985	0%
2018	985	0%
<i>2020</i>	<i>1,011</i>	<i>1.31%</i>
<i>2025</i>	<i>1,172</i>	<i>3.0%</i>
<i>2030</i>	<i>1,355</i>	<i>2.94%</i>
<i>2035</i>	<i>1,555</i>	<i>2.79%</i>
<i>2040</i>	<i>1,705</i>	<i>1.86%</i>

ArcGIS Web Map



1:18,056



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, Oregon Metro, Bureau of Land Management, State of Oregon, State of Oregon DOT, State of Oregon GEO, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METINASA, EPA, USDA | Marion County Oregon | Marion County Planning | MC

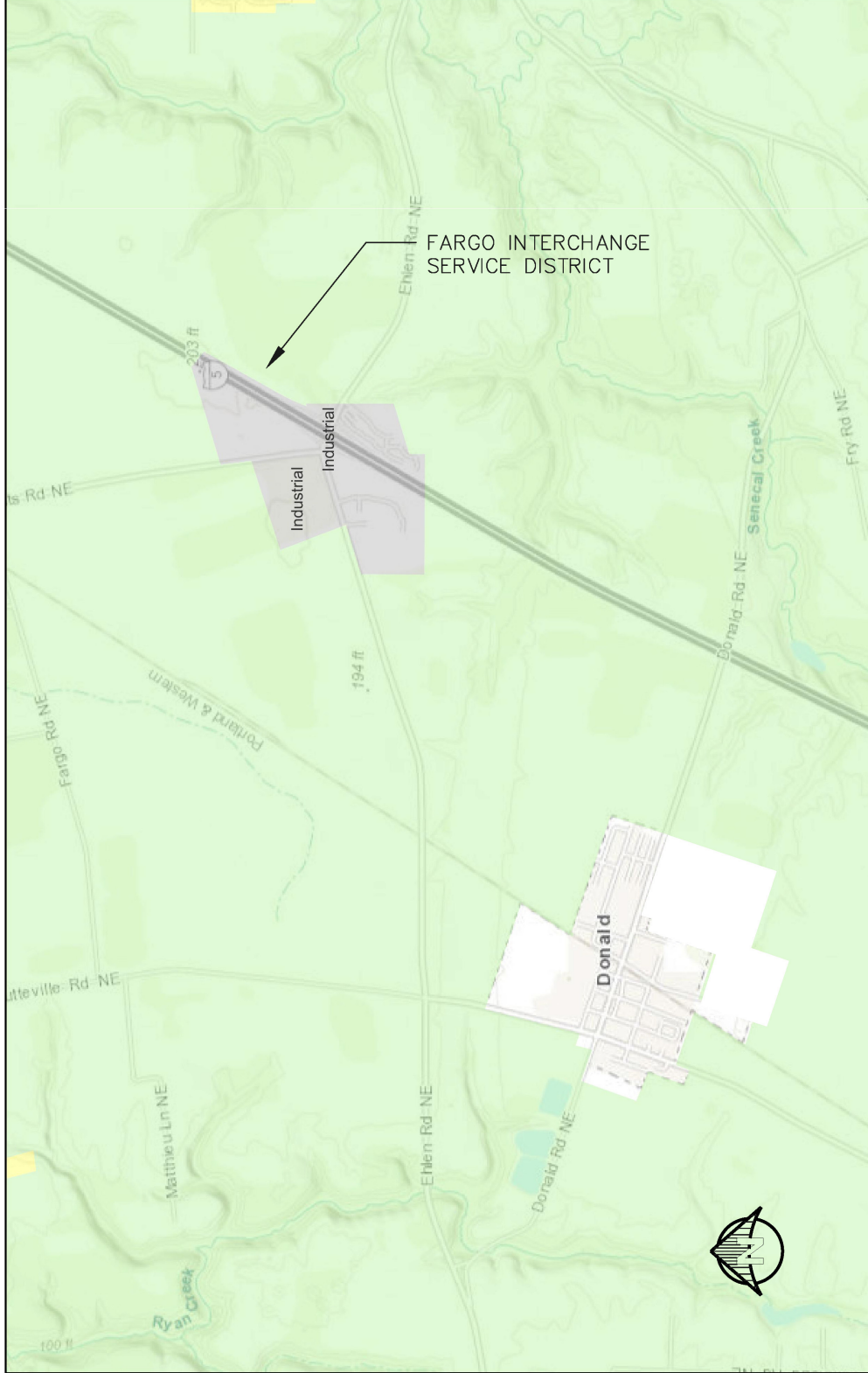
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County Zoning

EFU

FIGURE 3-B COUNTY LAND USE DESIGNATION MAP

ArcGIS Web Map



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County Zoning



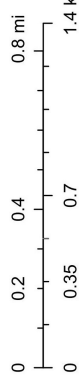
EFU

Acresage Residential



Industrial

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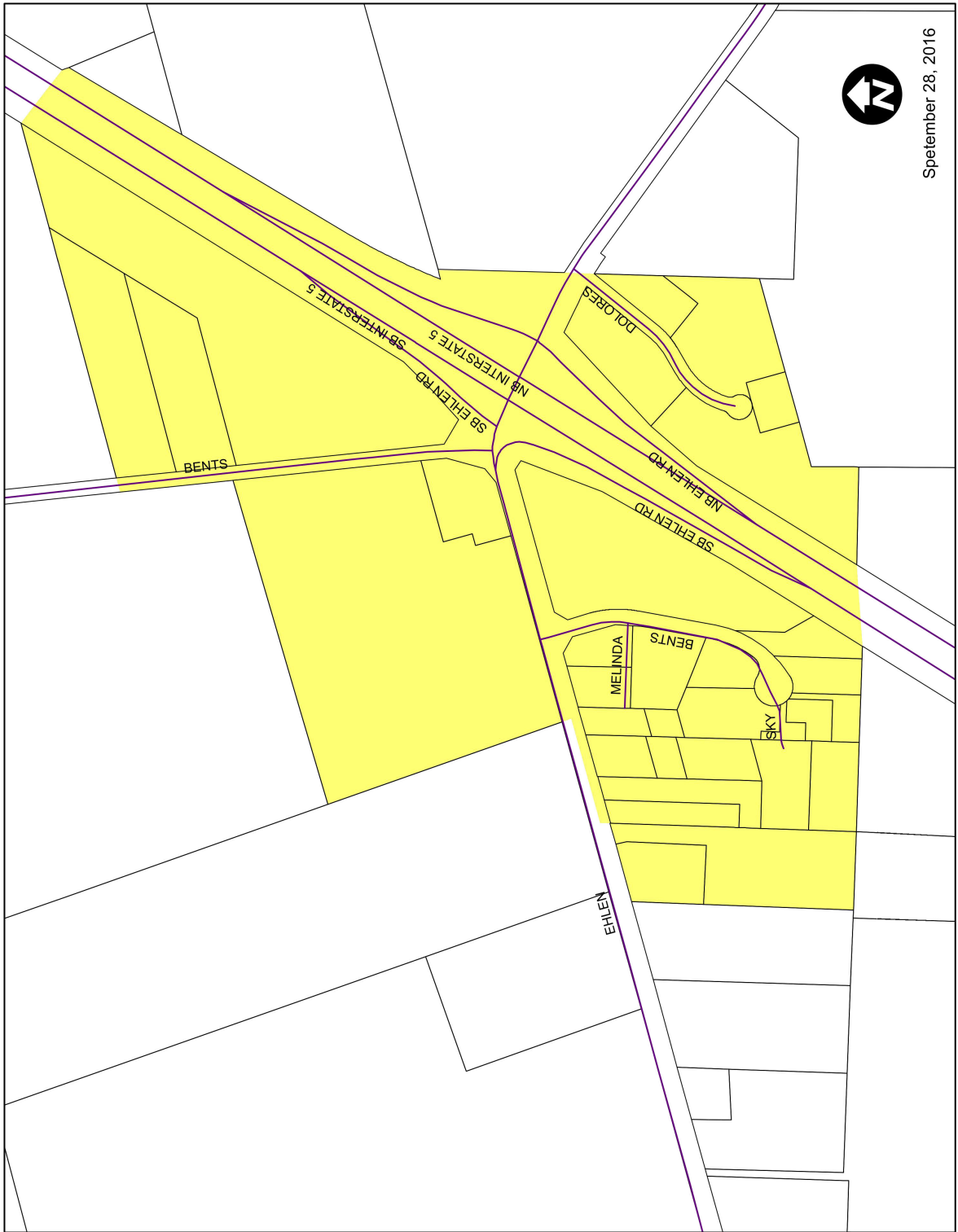


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USG

Web AppBuilder for ArcG

Oregon Metro, Bureau of Land Management, State of Oregon, State of Oregon DOT, State of Oregon GEO, Esri, Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA | Marion County | Marion County Oregon | Marion County Planning |

FIGURE 3-C DONALD AND FARGO ISD SITE MAP



September 28, 2016

FIGURE 3-D FARGO INTERCHANGE SERVICE DISTRICT

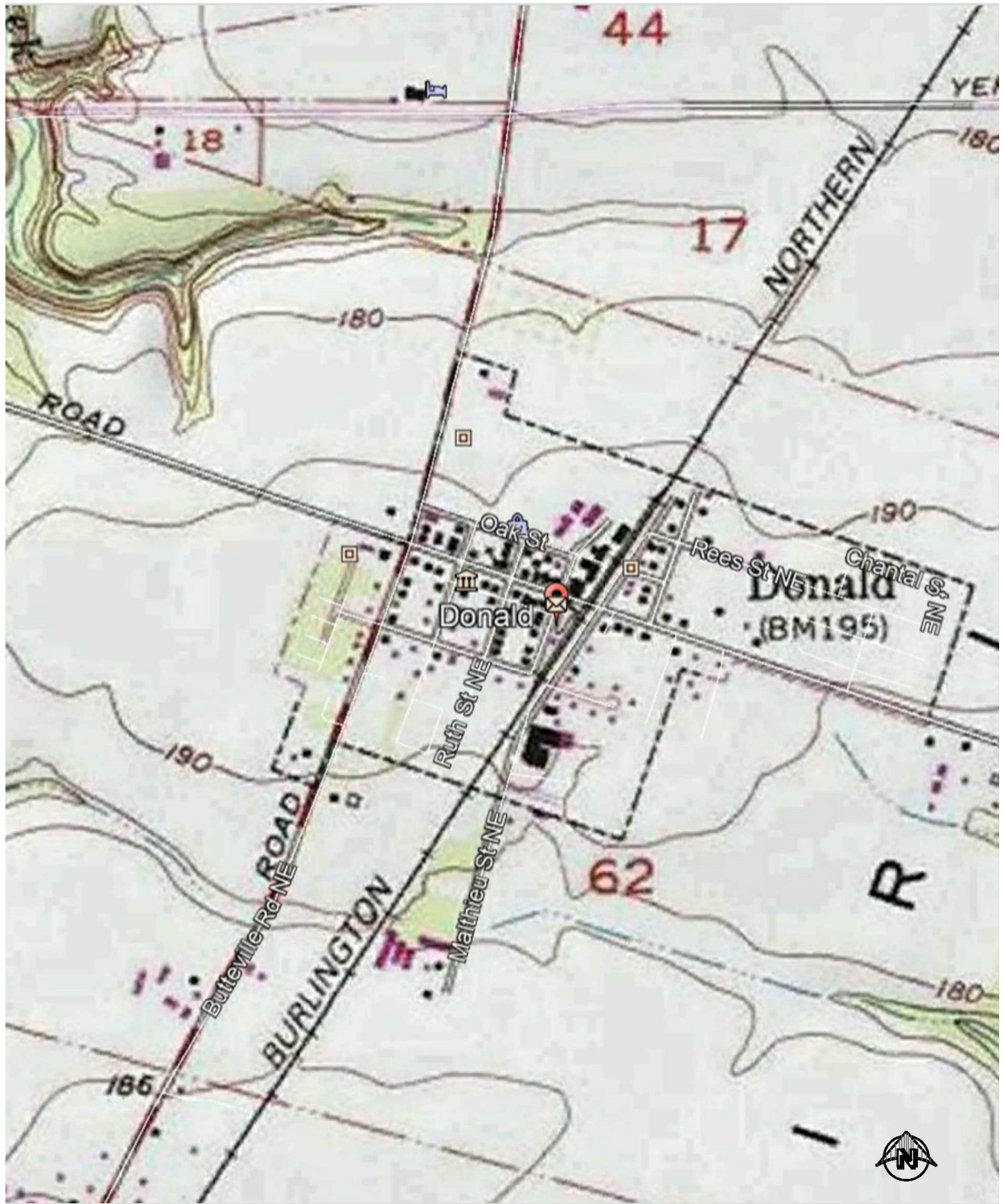


FIGURE 3-E CITY OF DONALD TOPOGRAPHY MAP

## IV. EXISTING FACILITIES

### A. Location

The existing Wastewater Treatment Facilities are located on City-owned property west of the City of Donald, outside of the UGB as shown in the aerial photo in Figure 4-A. The Recycled water irrigation site is located on the same tax lot and is shown in Figure 4-B.

### B. History

In the 70's it was determined that the City of Donald was having City-wide subsurface disposal system failures due to high water table conditions. In the 1970's the County Sanitarian and the Department of Environmental Quality placed a building moratorium on the City so that no more building permits could be issued until the situation was remedied.

There was a concept in the early 70's to have the City of Donald join a regional system consisting of the Cities of Woodburn, Hubbard, Gervais and Aurora through an interceptor sewer along the Fargo Interchange. The proposed project obviously never materialized.

In 1974 a study prepared by Clark & Groff Engineers, recommended the construction of a City-wide collection system, a 4.6 acre 12-foot deep lagoon with 15 acres of land for irrigation of disinfected effluent. The plan was not adopted by the City.

In 1979, Boatwright Engineering prepared a facilities plan for the City; however, no copies of this 1979 plan are currently available. In 1981, Boatwright Engineering prepared an updated summary and amendment to the 1979 Facilities Plan that recommended the construction of the current STEP collection and 10 acres of lagoon treatment system, with on-site recycle using irrigation facilities.

#### 1. Donald Collection System

In 1981 the City of Donald completed the facilities planning process which resulted in selecting a Septic Tank Effluent Pumping (STEP) system with lagoon treatment and land irrigation process. The system was initially constructed in 1983 and currently includes three lagoons, and approximately four miles of pressurized collection system.

There are approximately 2,600 lineal feet of 2" and 2 1/2" force mains that are privately owned and operated. All public force mains are HDPE 3" to 6" diameter. An inventory of the City's public collection system piping is listed in the following table:

**Table IV-1: City of Donald  
Existing Sanitary Sewer Collection System**

<i>Line Size</i>	<i>Length</i>
3"	4,000 feet
4"	3,550 feet
6"	12,275 feet

There are currently a total of 404 connections to the City's wastewater systems, the majority with an individual septic tank and effluent pump that discharges to the pressurized force mains. Depending upon size, the septic tanks have an operating volume of 70 to 140 gallons between pump on and pump off. Each pump has a design flow of from 10 to 50 gallons per minute, depending upon the dynamic head. The City's standard pump is a 1/2 horsepower Champion Model CPW5.

Figure 4-C shows the size and location of the collection system piping.

## **2. Donald Lagoon Systems**

The City's lagoon system, which was constructed in 1983, includes three sequential cells with bentonite liners. Cells one and two are each nominal 2.5-acre stabilization lagoons, and cell three is a nominal 5-acre storage cell. All three cells are constructed with native material and have a maximum water depth of 9.5 feet. Cell 3 was leak tested for DEQ in 1998, however, the test results are not in the City's records.

The floor elevation of all three cells is 173.50 feet, and the top of berm elevation is 185.0 feet. The total storage volume of all three cells, between low water level of 2.5 feet and max water level of 9.5 feet, is 62.47 acre-feet, or 20.3 million gallons. The Lagoon System Hydraulic Profile and Design Criteria are shown in Figure 4-E.

## **3. Fargo Interchange Service District Lagoon**

In 1993, the City of Donald entered into an intergovernmental agreement to accept wastewater from the Fargo Interchange Service District. This is a Marion County sanitary district limited to serving the area zoned as Interchange Development (ID) at the Fargo interchange with the Interstate 5 Freeway. Buildout of the interchange is limited by the zoning and is not anticipated to be increased beyond its current ID zoned limits.

In 2008, the City of Donald constructed and leak tested the HDPE lined Lagoon No. 4 dedicated to the Fargo Interchange Service District. This lagoon has a maximum water depth of 11'4" and storage volume of 38.1 acre-feet, or 12.4 million gallons. As with all City lagoons, Lagoon No. 4 is operated and well maintained by the City.

## **4. Effluent Disinfection and Irrigation System**

The City of Donald owns a total of 56 acres available for effluent recycle, separated into three parcels, of which only two are currently developed for irrigation. There are approximately 8.3 acres available north of Ryan Creek, 41.3 acres north and east of the Fargo ISD lagoon which are currently irrigated, and 6.4 acres west of Lagoon Number 3 currently undeveloped for irrigation but available, as shown on Figure 4-B.

Lagoon effluent is disinfected with sodium hypochlorite and pumped to the irrigation sites, which are leased to a local farmer. Irrigation has been accomplished on the sites using a variety of big gun distributor, fixed sets and most recently, drip systems. Currently all irrigation efforts are provided by the lease holder, in close coordination with the plant operators.

## C. Condition of the Existing Facilities

### 1. Management

The City of Donald has two certified operators that operate and maintain the public works infrastructure of the City, including operation and maintenance of the water and wastewater systems. The Public Works Director has Grade II certifications for collections and treatment. The Operator has a Grade I certification for collections. DEQ requires a Level 1 certification for both collections and treatment.

### 2. Waste Discharge Permit Compliance

The current Water Pollution Control Facility (WPCF) permit expires on November 30, 2022. Conditions of the permit are as follows:

#### a. Schedule A - Waste Discharge Limit

Schedule A of the City of Donald's WPCF permit establishes waste discharge limitations for the treatment of lagoon effluent and distribution of recycled water for beneficial uses. Schedule A of the permit has the following limitations:

- 1. Treated Effluent Outfall 001 - The permittee is authorized to distribute recycled water if it is:*
  - a. The Permittee must notify DEQ in writing which recycled water treatment, Class D or Class C is employed prior to irrigation. DEQ must be notified prior to any change in treatment Class. Once notified, DEQ will give written approval to the permittee for recycled water treatment class prior to recycled water use.*
  - b. Treated and used according to the criteria listed in Table A1 (below).*
  - c. Managed as described in its DEQ-approved Recycled Water Use Plan unless exempt as provided in Schedule D, condition D.3.*
  - d. Used in a manner and applied at a rate that does not impact groundwater quality.*
  - e. Applied at a rate and in accordance with site management practices that ensure continued agricultural, horticultural, or silvicultural production and does not reduce the productivity of the site.*
  - f. Irrigated using sound irrigation practices to prevent:*
    - i. Offsite surface runoff or subsurface drainage through drainage tile;*
    - ii. Creation of odors, fly and mosquito breeding, or other nuisance conditions; and*
    - iii. Overloading of land with nutrients, organics, or other pollutants.*



Table IV-2: City of Donald  
Recycled Water Permit Limits

<b>Class</b>	<b>Level of Treatment (after disinfection unless otherwise specified)</b>	<b>Beneficial Uses</b>
<b>C</b>	<p><i>Oxidized and disinfected. Total coliform may not exceed:</i></p> <ul style="list-style-type: none"> <li>• <i>A median of 23 total coliform organisms per 100 mL, based on results of the last 7 days that analyses have been completed<sup>2</sup>.</i></li> <li>• <i>240 total coliform organisms per 100 mL in any two consecutive samples.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Class D and nondisinfected uses.</i></li> <li>• <i>Irrigation of processed food crops; irrigation of orchards or vineyards if an irrigation method is used to apply recycled water directly to the soil.</i></li> <li>• <i>Landscape irrigation of golf courses, cemeteries, highway medians, or industrial or business campuses.</i></li> <li>• <i>Industrial, commercial, or construction uses limited to: industrial cooling, rock crushing, aggregate washing, mixing concrete, dust control, nonstructural firefighting using aircraft, street sweeping, or sanitary sewer flushing.</i></li> </ul>
<b>D</b>	<p><i>Oxidized and disinfected. E. coli may not exceed:</i></p> <ul style="list-style-type: none"> <li>• <i>A 30-day log mean of 126 organisms per 100 mL.</i></li> <li>• <i>406 organisms per 100 mL in any single sample.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Nondisinfected uses.</i></li> <li>• <i>Irrigation of firewood, ornamental nursery stock, Christmas trees, sod, or pasture for animals.</i></li> </ul>

## **2. Groundwater Protection**

*The permittee may not conduct any activities that could cause an adverse impact on existing or potential beneficial uses of groundwater. All wastewater and process related residuals must be managed and disposed of in a manner that will prevent a violation of the Groundwater Quality Protection Rules (OAR Chapter 340, Division 40).*

### 3. *Septage Requirements*

*Septage may not be accepted at this facility for treatment or processing without written approval from DEQ.*

The City of Donald distributes recycled water in accordance with the requirements of Schedule A Items a through f. Under Table A1, the City produces a Class C recycled water through disinfection with sodium hypochlorite, and has continued to meet the limitation for Total Coliform as evident by the discharge monitoring report results shown in Appendix D. Land application sites are managed to prevent the degradation of groundwater through the agronomic application of the treated effluent to the land application sites.

In accordance with Schedule A, paragraph 3, the City does not receive septage at the wastewater treatment facility.

#### **b. Schedule B - Minimum Monitoring and Reporting Requirements**

Schedule B, paragraph 2 of the permit establishes the Influent Monitoring Requirements which state: *"The permittee must monitor influent from both the City's collection system and the Fargo Interchange Service District."* The permit also establishes the measurement locations and identifies the monitoring requirements in Table B1 as shown below.

**Table IV-3: City of Donald  
Influent Monitoring Requirements**

<i>Item or Parameter</i>	<i>Time Period</i>	<i>Minimum Frequency</i>	<i>Sample Type</i>	<i>Report</i>
<i>Total Flow (MGD)</i>	<i>Year-round</i>	<i>Daily</i>	<i>Measurement</i>	<i>Daily Values</i>
<i>Flow Meter Calibration</i>	<i>Year-round</i>	<i>Annually</i>	<i>Verification</i>	<i>Report that calibration was completed is due by January 31 of each year</i>

Flows from the City and Fargo ISD are measured and recorded as required by the permit conditions.

Schedule B, paragraph 4 establishes the minimum monitoring requirements for outfall #001 which is the recycle water from the irrigation pump. Table B2 lists the parameters to be monitored, monitoring frequency, and the sample type as shown below.

**Table IV-4: City of Donald  
Recycled Water Monitoring Requirements**

<i>Item or Parameter</i>	<i>Minimum Frequency</i>	<i>Sample Type</i>
<i>Total Flow (MGD) or Quantity Irrigated (inches/acre)</i>	<i>Daily</i>	<i>Measurement</i>
<i>Flow Meter Calibration</i>	<i>Annually</i>	<i>Verification</i>
<i>Quantity Chlorine Used (lbs)</i>	<i>Daily</i>	<i>Measurement</i>
<i>Chlorine, Total Residual (mg/L)</i>	<i>Daily</i>	<i>Grab</i>
<i>pH</i>	<i>2/week</i>	<i>Grab</i>
<i>Total Coliform</i>	<i>Weekly (Class C)</i>	<i>Grab</i>
<i>E. Coli (see note a)</i>	<i>Weekly (Class D)</i>	<i>Grab</i>
<i>Nutrients (TKN, No2 + NO3-N, NH3, total Phosphorus)</i>	<i>Quarterly</i>	<i>Grab</i>
<p><i>Note:</i>  <i>a: Only one bacterial monitoring requirement is required at this time. The permittee may use both Class D and/or C in the same year with written approvals (C and/or D) from the Department.</i>  <i>b: The permittee must have a DEQ approved, Recycled Water Use plan prior to land applying Class D recycle water, See Schedule D, Item 3 for details.</i></p>		

Recycle water monitoring takes place only when irrigation water is being applied to the land application sites. This typically occurs between May and October each year when the lagoons are drawn down to prepare for storage during the remainder of the wet weather period. The City is in compliance with these monitoring requirements.

Schedule B, paragraph 5 sets forth the minimum reporting requirements for submitting monthly reports as well as the form and contents of the reports. In addition, there are annual reports that are called for in Table B3 as shown below.

**Table IV-5: City of Donald  
WPCF Permit Reporting Requirements**

<i>Reporting Requirement</i>	<i>Frequency</i>	<i>Due Date</i>	<i>Report Form (unless otherwise specified in writing)</i>	<i>Submit To:</i>
<i>Recycle water annual report describing effectiveness of recycle water system in complying with the DEQ-approved recycled water use plan, OAR 340-055, and this permit. See Schedule D for more detail.</i>	<i>Annually</i>	<i>January 15</i>	<i>2 hard copies</i>	<i>One each to:</i> <ul style="list-style-type: none"> <li>• <i>DEQ Regional Office</i></li> <li>• <i>DEQ Water Reuse Program Coordinator</i></li> </ul>
<i>Inflow and infiltration Report</i>	<i>Annually</i>	<i>February 1</i>	<i>1 hard copy</i>	<i>DEQ Regional Office</i>
Notes:  a. Name, certificate classification, and grade level of each responsible principle operator as well as identification of each system classification must be included on DMRs. b. Equipment breakdowns and bypass events must be noted on the DMRs.				

The City is in compliance with all monitoring and reporting requirements as called for in Schedule B according to recent Discharge Monitoring Reports (See appendix B).

As required by the WPCF permit, the City of Donald monitors effluent nutrients. The following table is a summary of test results for the past four years:

**TABLE IV-6: City of Donald  
Lagoon Effluent Nutrients Test Results (mg/L)**

	<i>7/2014</i>	<i>7/2015</i>	<i>10/2015</i>	<i>6/2016</i>	<i>9/2016</i>	<i>10/2017</i>	<i>6/2018</i>	<i>Average</i>
Ammonia	2.9	0.44	13.6	16.9	2.9	15.8	17.1	6.96
Nitrate	ND	ND	ND	0.23	ND	0.25	0.08	0.06
Nitrite	2.02	0.01	0.04	0.16	0.05	0.11	0.1	0.25
TKN	6.82	3.46	24.9	18.8	9.5	19.2	18.6	10.13
Phosphorus	1.63	1.57	4.85	3.1	4.6	2.93	3.73	2.24

### **3. System Failures**

System failures have been limited to isolated incidents of STEP pump failures and fouling of the septic tank effluent screens. The STEP systems are maintained by the City, and failures are routinely repaired by City staff on an as-needed basis. All residential services are inspected on a five-year schedule, and commercial/industrial on a three-year schedule.

The only substantial failure in recent operations resulted in the irrigation pump intake becoming fouled in 2018. The intake screen on the pump was subsequently removed and the pump operation was restored.

The current pump configuration makes access to the screen very difficult. Considering the clearances in the pump impellers and in the irrigation nozzles, the system can operate normally without the suction screen.

### **4. Violations of Regulatory Requirements**

The City of Donald operates and maintains the Wastewater Collection, Treatment and Water Reuse system under Water Pollution Control Facilities (WPCF) permit No. 101978, most recently re-issued on December 28, 2012. The permit establishes treatment requirements for the City of Donald's Wastewater Treatment Facility and application of Recycled Water. A copy of the WPCF permit and Recycle Water Reuse Plan has been provided in Appendix A.

In 2012, the City of Donald hired a new City Manager and Public Works Director. The records indicate the City has been in compliance with all of the conditions of the WPCF permit since 2012. There have, however, been three events where the City requested approval to initiate irrigation operations prior to the permitted season to avoid overflowing the lagoons. Those DEQ approved events occurred in 2016 from 3/14/2016 to 3/21/2016, in 2017 from 3/13/2017 to 3/17/2017 and 4/17/2017 to 4/21/2017.

### **5. Collection and Treatment System Condition and Capacity**

Capacities identified for each component of the system, unless noted otherwise, are typically stated in average annual daily flow. This is the average daily flow over the entire year. 60% of the annual flow is estimated to be collected during the six wet weather months, leaving 40% to be collected during the dry weather months.

#### **a. Collection System**

The Collection system is well maintained by the City with repair and replacement of the septic tank pumps as needed. The City keeps an inventory of spare parts on-hand for repair of the STEP system.

The City has divided the collection system into five zones, and the residential septic tanks are pumped once every five years in each zone. Commercial/Industrial services are pumped on a three year cycle. Septage is transported by contract to either the Salem Wastewater Treatment facility or the Woodburn facility. At the same time, an I/I inspection is completed at each connection and the septic tank access points repaired if any deficiencies are noted.

The collection system is a pressurized piping system with individual pumps at each service connection. Each pump is capable of discharging up to 50 gpm dependent on dynamic head, and the velocities in the force mains are dependent upon the number of pumps operating at any one time.

The size of the collection system does not absolutely limit the number of STEP pumps that can be connected to the system. However, as the system loads increase, the collection system pumps will operate longer against higher dynamic head conditions to evacuate the same operating volume.

Exceeding the capacity of the collection system piping would manifest itself in random overflows of individual septic tanks, when flow into the septic tank is greater than the pump capacity evacuating the tank. The freeboard in the septic tanks will provide protection against this occurring routinely.

In total, if all pumps operated at the same time, disregarding the dynamic head restrictions, the instantaneous flows would exceed 20 million gallons per day. In actuality, empirical data have been collected by EONE Sewer Systems, a manufacturer of individual pumping systems, to determine an estimate of the number of pumps that could be expected to operate at any one time. The flow from each pump and the number of pumps operating at any one time was used to model the collection system performance.

Modeling was completed on the estimated build-out collection system by first dividing the urban growth boundary into multiple pump zones as show in Figure 4-D, and applying the empirically derived number of pumps operating simultaneously. The following table was used to define the number of pumps operating simultaneously based on the total number of pumps in each collection zone:

**Table IV-7: City of Donald  
STEP System Pump Operations**

<i>Total Number of Pumps</i>	<i>Estimated Pumps Operating Simultaneously</i>	<i>Total Number of Pumps</i>	<i>Estimated Pumps Operating Simultaneously</i>
1	1	312-344	15
2-3	2	345-377	16
4-9	3	378-410	17
10-18	4	411-443	18
19-30	5	444-476	19
31-50	6	477-509	20
51-80	7	510-542	21
81-113	8	543-575	22
114-146	9	576-608	23
147-179	10	609-641	24
180-212	11	642-674	25
213-245	12	675-707	26
246-278	13	708-740	27
279-311	14	741-773	28

The force mains are adequate until the individual pumps are no longer able to discharge at a rate higher than wastes are entering the tanks. Overflow from the individual septic tanks would then occur. Due to the elevations of the structures served, wastewater would overflow the septic tanks before ever backing-up into the serviced buildings.

Developers of large residential areas have suggested the use of a STEG system, which is a Septic Tank Effluent Gravity system, for the newer annexed areas. With a STEG system, each service would have an individual septic tank, but the effluent would flow by gravity to a common pump station.

With a STEG system, the effluent from the common pump station would surcharge the collection system momentarily during the pump operations. The STEG pump station can easily be designed for the anticipated dynamic head, but the existing STEP pumps could be pushed back with the higher dynamic head towards their shut-off point. This potential is not anticipated to warrant replacement of the existing collection system mainlines, or to warrant a separate dedicated force main to the Wastewater Lagoons for a STEG system,

A STEG pump station would be anticipated to have a capacity of 350 gallons per minute, or less, with a cycle time minimized to limit the impact to the STEP systems. During the off cycle, the collection system would operate as if none of the STEG systems were connected.

The existing HDPE collection system is relatively new at 35 years, and adequate to meet current and future needs. The size and condition of the collection system will have no impact on its ability to serve growth through the planning window.

**b. Infiltration & Inflow Review**

City of Donald:

A brief analysis of Infiltration and Inflow (I/I) was made by comparing seasonal flows. I/I does not enter the collection system directly, due to the pressurized pipelines, however, I/I does enter the private service lines and septic tanks.

In the Willamette Valley the wet weather period typically occurs from November through April and the dry weather period May through October. These time frames have been used to compare the collection system wet weather to dry weather flows for the last 4 years to analyze the contribution of Inflow and Infiltration into the system as shown in the following table.

**Table IV-8: City of Donald  
Wastewater Flow Records, Thousand Gallons**

	2017		2016		2015		2014	
	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
<i>January</i>	2,327	0	2,174	0	1,816	0	1,657	0
<i>February</i>	3,029	0	1,936	0	1,880	0	2,084	0
<i>March</i>	2,662	0	2,279	0	1,788	0	2,269	0
<i>April</i>	1,938	0	1,626	0	1,549	0	1,771	0
<i>May</i>	0	1,722	0	1,629	0	1,570	0	1,723
<i>June</i>	0	1,596	0	1,574	0	1,521	0	1,597
<i>July</i>	0	1,587	0	1,567	0	1,473	0	1,663
<i>August</i>	0	1,587	0	1,534	0	1,510	0	1,623
<i>September</i>	0	1,447	0	1,446	0	1,468	0	1,529
<i>October</i>	0	1,566	0	1,707	0	1,556	0	1,606
<i>November</i>	1,881	0	2,130	0	1,633	0	1,604	0
<i>December</i>	2,003	0	2,361	0	3,166	0	2,069	0
<b>TOTAL, MG (% of annual)</b>	<b>13,840 (59.3%)</b>	<b>9,505 (40.7%)</b>	<b>12,506 (56.9%)</b>	<b>9,457 (43.1%)</b>	<b>11,832 (56.5%)</b>	<b>9,098 (43.5%)</b>	<b>11,454 (54.0%)</b>	<b>9,741 (46.0%)</b>
<b>AVERAGE, gpd</b>	<b>76,464</b>	<b>51,658</b>	<b>69,094</b>	<b>51,397</b>	<b>65,370</b>	<b>49,446</b>	<b>63,282</b>	<b>52,940</b>
<b>Per Capita, Flow, gpd</b>	<b>78</b>	<b>52</b>	<b>71</b>	<b>52</b>	<b>67</b>	<b>50</b>	<b>65</b>	<b>54</b>
<b>Per Capita, Flow Ave, gpd</b>	<b>65</b>		<b>62</b>		<b>59</b>		<b>60</b>	
<b>Max Month W:D Ratio</b>	<b>2.2:1</b>		<b>1.6:1</b>		<b>2.1:1</b>		<b>1.5:1</b>	



As shown in the preceding table, the ratio of highest monthly average wet weather flow to minimum monthly dry weather flows varied from a low of 1.5 to 1, to a high of 2.2 to 1. The percentage of annual flow delivered to the lagoons during the wet weather season has steadily increased annually from 54% in 2014 to the current 59% in 2017. With a population of approximately 985, the maximum wet weather month of February 2017 had a per capita contribution of 109 gallons per day per person.

To be conservative, a design criteria of 65 gpd per capita, average annual flow, will be used for this planning update.

Fargo Interchange Service District:

The Fargo ISD has a conventional gravity collection system with a single pumping station that discharges to the Donald ISD Lagoon No. 4 at the Donald Treatment Plant site. A review of the Fargo ISD flow records for the same 4-years period is shown in the following table.

**Table IV-9: Fargo ISD  
Wastewater Flow Records, Thousand Gallons**

	2017		2016		2015		2014	
	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
<i>January</i>	2,560	0	2,170	0	1,372	0	882	0
<i>February</i>	2,489	0	1,988	0	1,590	0	1,743	0
<i>March</i>	2,282	0	2,204	0	1,569	0	2,213	0
<i>April</i>	2,071	0	1,128	0	1,433	0	1,949	0
<i>May</i>	0	2,014	0	816	0	1,076	0	1,857
<i>June</i>	0	2,051	0	839	0	982	0	1,083
<i>July</i>	0	1,557	0	784	0	1,093	0	998
<i>August</i>	0	1,902	0	686	0	975	0	917
<i>September</i>	0	1,524	0	894	0	992	0	928
<i>October</i>	0	1,093	0	988	0	1,083	0	885
<i>November</i>	1,242	0	1,192	0	744	0	911	0
<i>December</i>	1,377	0	2,161	0	2,005	0	1,140	0
<b>TOTAL, MG (% of annual)</b>	<b>12,021 (54.2%)</b>	<b>10,141 (45.8%)</b>	<b>10,843 (68.4%)</b>	<b>5,007 (31.6%)</b>	<b>8,713 (58.4%)</b>	<b>6,201 (41.6%)</b>	<b>8,838 (57.0%)</b>	<b>6,668 (43.0%)</b>
<b>AVERAGE, gpd</b>	<b>66,414</b>	<b>55,114</b>	<b>59,906</b>	<b>27,212</b>	<b>48,138</b>	<b>33,701</b>	<b>48,829</b>	<b>36,239</b>
<b>Annual Ave, gpd</b>	<b>60,700</b>		<b>43,560</b>		<b>40,920</b>		<b>42,530</b>	
<b>Max Month W:D Ratio</b>	<b>2.3:1</b>		<b>3.2:1</b>		<b>2:1</b>		<b>2.5:1</b>	

I/I contributions in the Fargo ISD collection system appear to be relatively constant over the past four years, and are slightly greater than the I/I from the City of Donald system.

The Fargo ISD flows have varied substantially, which is thought to be related to potential metering concerns. The average influent flow from the Fargo ISD over the past four years is 46,900 gpd. Due to the number of commercial and industrial services in the Fargo ISD system, a comparison on a per capita basis is not feasible. This planning document will use the average of the past four years as the current flow.

In general, the contribution of I/I into the City and Fargo ISD collection systems are not considered excessive for a community of this size, or Cities located in the Willamette Valley. The City and the Fargo ISD should continue to pursue eliminating any I/I within their respective collection systems where it is economically feasible to do so.

Metering of the Fargo ISD wastewater flows has shown a discrepancy between the Fargo ISD meter and the identical Fargo ISD meter at the lagoon site. Apparently beginning in 2017, recorded flows are higher at the lagoon meter than recorded at the Fargo ISD pump station meter. The discrepancy varies from 10% to 30% on any monthly summary. For the purposes of this update, flow records provided by the lagoon meter have been used.

Both Fargo ISD meters were replaced in September of 2017, yet the reading discrepancy has not been resolved. This needs to be resolved to better quantify the impact of the Fargo ISD wastewater flows into the limited capacity of the Fargo ISD lagoon.

### **c. Collection System**

The public collection system piping is HDPE pipe varying from 3" to 6" diameter. The capacity of each pressurized line has proven to be adequate with the current pumped collection system. The capacity of the force mains is limited only by the capacity of each pump discharging to the system.

The largest of the collection system lines is nominal 6" diameter. The instantaneous flow capacity in this main line is estimated at a maximum of 500 gpm. Based on the average daily flow of 64,000 gpd, this force main would only approach this instantaneous flow very infrequently and for short durations.

The capacity of each force main should be limited to approximately 6 feet per second velocity to minimize head losses. Based on 15 gpm output from each individual STEP pump, the following table is an estimate of the total number of pumps operating simultaneously to reach 6 fps velocity:

**Table IV-10: City of Donald  
STEP Collection System Sizing**

<i>Pipe Dia</i>	<i>Flow at 6 fps, gpm</i>	<i>STEP Pumps Operational</i>	<i>STEP Pumps Total</i>
2"	60	4	< 18
2.5"	92	7	< 80
3"	132	9	< 146
4"	236	16	< 377
6"	530	35	< 1004

Projecting a proportional increase in the number of sewer connections based on population to the year 2040, results in an estimated 705 sewer connections. With a total of 705 pumps in a STEP system, the maximum number of pumps operating simultaneously is estimated at 26, with an estimated peak flow as high as 400 gpm in the 6" force main.

Unlike a conventional gravity collection system, which would surcharge manholes and overflow, a pressurized collection system will always contain the flow. Exceeding the system capacity would be reflected in increased dynamic head that each STEP system must pump against. This, in turn, would reduce the output of each operating pump and extend the time required to evacuate the operational volume in the septic tanks. The existing collection system can accommodate growth either the use of additional STEP systems or a common pump station with individual STEG systems.

**d. Donald treatment and Storage Lagoon System**

The City's lagoon system consists of three sequential cells. Cells one and two are each stabilization lagoons and cell three is a storage cell. The following Table summarizes the existing City of Donald lagoon design criteria and capacity.

**Table IV-11: City of Donald  
Existing Lagoon 1, 2 & 3 Design Criteria**

Influent	Design Population:	1,030
	Design Flow:	79,310 gpd
	Per Capita Flow:	70 gpd
	Industrial Flow:	10% of Residential
	Influent BOD:	167 mg/L
	BOD Loading:	110 lbs/d
	Influent TSS:	50 mg/L
	TSS Loading	33 lbs/d
Primary Cell, Cell No. 1	Area:	2.5 acres
	Max Water Depth:	9.5 feet
Secondary Cell, Cell No. 2	Area:	2.5 acres
	Max Water Depth:	9.5 feet
Storage Lagoon Cell No. 3	Area:	5.0 acres
	Max Water Depth:	9.5 feet

Conventional lagoon design criteria limits organic loading capacity to 50 pounds per day per acre in the primary cell, and 35 pounds per day overall in the total area of all cells. Organic treatment criteria can be met with the primary and secondary cells. Solids loading from TSS is not anticipated to be limited in a lagoon system due to the volume of available sludge storage, and the use of a STEP system which reduces solids transport to the lagoons.

The lagoons were designed to operate between a minimum water depth of 2.5 feet to a maximum depth of 9.5 feet, leaving 24" of freeboard.

The following table lists the area and volumes of each of the three cells based on a minimum water depth of 2.5 feet (Elevation 176), and a maximum water depth of 9.5 feet (Elevation 183), accounting for a 2-foot freeboard:

**Table IV-12: City of Donald  
Existing Lagoon 1, 2 & 3 Operational Volume**

<i>Water Elev ft</i>	<i>Cell 1 Area sq ft</i>	<i>Cell 1 Volume Ac ft</i>	<i>Cell 2 Area sq ft</i>	<i>Cell 2 Volume ac ft</i>	<i>Cell 3 Area sq ft</i>	<i>Cell 3 Volume ac ft</i>
176	78,851		76,888		190,853	---
177	82,089	1.85	80,214	1.80	196,009	4.44
178	85,385	1.92	83,597	1.88	201,222	4.56
179	88,736	2.00	87,036	1.96	206,491	4.68
180	92,145	2.08	90,532	2.04	211,817	4.80
181	95,609	2.16	94,084	2.12	217,199	4.92
182	99,130	2.24	97,693	2.20	222,638	5.05
183	102,708	2.32	101,359	2.28	228,133	5.17
	Total	14.55	Total	14.29	Total	33.63
<b>Total Acre-feet Cells 1, 2 &amp; 3</b>						<b>62.47</b>

The existing Donald Lagoons have the capacity to treat 125 pounds of organic load in each of the two stabilization cells, 250 pounds per day total, and the total of the three cells has a hydraulic storage capacity of 62.5 acre-feet.

As demonstrated in the I/I review above, 60% of the annual flow is anticipated to be stored during the wet weather period. Mean precipitation during the same time period is 30.21" from the OSU Agricultural Experiment Station 1993 Climate of Oregon Climate Zone 2 Willamette Valley. Mean pan evaporation is 10.72" from the 1982 NOAA Mean Monthly, Seasonal, and Annual Pan Evaporation for the United States. In summary, the 62.5 acre-feet of storage would accommodate an average annual daily flow of 68,800 gpd.

At 68,800 gpd, the storage capacity of the City's lagoons restricts the design capacity to approximately 87% of the 79,310 gpd capacity listed on the 1983 plans. A summary of the Donald lagoon's capacity is as listed below:

**Table IV-13: City of Donald  
Existing Lagoon 1, 2 & 3 Capacity**

Total Area	10 Acres
Operational Storage Capacity	62.5 ac ft
Organic Capacity	250 lbs/day
Average Annual Flow Capacity	68,800 gpd

The City does not have an approved biosolids management plan and is not anticipated to remove solids within the planning window of this report. The City monitors the sludge blanket, and indicates Cells 1, 2 and 3 have a sludge blanket of 8" to 9". The Fargo ISD Cell has a sludge blanket of approximately 10".

The lagoon site is well maintained by all appearances. Dike access roads are graveled, where not paved, and vegetation is kept under control within the fenced perimeter. There appears to be no evidence of damage to the dike slopes from wildlife. The maintenance garage and office building are in good condition and need no substantial improvements.



Donald WWTP Office Site



Lagoon No. 2



Lagoon No. 3



Lagoon No. 4

The Donald lagoons and effluent recycle systems are all maintained in good condition. Although there are some minor improvements desired, no deferred maintenance was noted in the system.

**e. Fargo ISD Lagoon System**

The Fargo Interchange Service District lagoon was constructed in 2006-7 and has a nominal area of 5 acres. This lagoon has a 60 mil, or 0.06 inch thick, HDPE liner and provides stabilization and storage for the Fargo ISD, and then discharges into the City of Donald Lagoon Cell 3 prior to effluent irrigation.

The lagoon design criteria are not shown on the construction plans. This lagoon was designed to accept typical municipal wastewater, with BOD and TSS estimated at 250 mg/L each. For a single cell lagoon system, the treatment capacity is estimated at 35 pounds per acre, or for the 5-acre lagoon, a total of 175 pounds per day. At 250 mg/L this equates to an average annual flow capacity of 84,000 gallons per day. At buildout of the current Fargo ISD boundaries, the total flow is projected to be 51,000 gpd with BOD and TSS of 106 pounds per day, each well below the treatment capacity of the existing lagoon.

Similar to the Donald lagoons, wet weather storage is the more critical design component. The Lagoon Capacity Analysis completed in 2015 indicated the lagoon had an operational storage volume of 37.1 acre-feet. Verifying calculations shown in the following table indicate the available volume is 38.1-acre feet with a 2-foot freeboard.

**Table IV-14: Fargo ISD Existing Lagoon 4 Operational Volume**

<i>Water Surface Elevation (ft)</i>	<i>Cell 4 Surface Area (sq ft)</i>	<i>Cell 4 Volume (ac ft)</i>
183.06	163,664	
184.0	168,180	3.58
185.0	173,039	3.92
186.0	177,955	4.03
187.0	182,927	4.14
188.0	187,955	4.26
189.0	193,041	4.37
190.0	198,182	4.49
191.0	203,381	4.61
191.9	208,107	4.72
	<b>Total ac ft</b>	<b>38.12</b>

Based on 60% of the annual flow collected during the wet weather season, a mean precipitation rate of 30.21" from the OSU Agricultural Experiment Station 1993 Climate of Oregon Climate Zone 2 Willamette Valley, and 10.72" of mean pan evaporation from the 1982 NOAA Mean Monthly, Seasonal, and Annual Pan Evaporation for the United States, the 38.1 acre-feet of storage would accommodate an annual average design flow of 44,600 gpd.

A summary of the Fargo Lagoon No. 4 design capacity is as follows:

**Table IV-15: Fargo ISD  
Existing Lagoon 4 Capacity**

Total Area	5 acres
Storage Capacity	38.1 ac ft
Organic Capacity	175 lbs/day
Average Annual Flow Capacity	44,600 gpd

Similar to the Donald treatment lagoons, the Fargo ISD Lagoon 4 is maintained by the City in as-new condition.

**f. Effluent Disinfection and Irrigation System Capacity**

The effluent irrigation and chlorination systems are housed in separate buildings at the lagoon site. The sodium hypochlorite feed system and storage tank appears to be in good condition, as does the building.

Lagoon effluent is disinfected in a 370-foot long, 36-inch diameter concrete pipe that functions as a contact chamber, which connects the disinfection building near Lagoon 3 to the irrigation pumping station building. This chamber provides 100 minutes of contact time at 200 gpm, and 50 minutes at 400 gpm.

The effluent is disinfected with sodium hypochlorite and pumped to irrigation at the end of the disinfection chamber. The pump station includes a single end-suction centrifugal pump with a capacity of 400 gpm at 73 psi. Following disinfection, flow is irrigated for beneficial use through an in-ground 5" PVC distribution header and multiple irrigation risers over approximately 49.6 acres of City-owned property, leased to a local farmer.



Chlorination Building



Hypochlorination system

The building housing the irrigation pump is in fairly good condition, but the metallic piping is showing signs of corrosion which is due to the presence of chlorine released from the pump wet well in the building.



Irrigation Pump Station Building



Irrigation Pump

Operation of the pump station has not been without its issues. The pump is located on grade with a long suction line into the wet well with a foot valve and strainer. The strainer was provided to prevent debris from clogging the pump, however, the strainer itself has plugged and has since been removed.



There is inadequate head room in the building to completely remove the irrigation pump from the wet well, so Staff is required to enter the wet well to service the strainer and foot valve.

Irrigation in previous years has been accomplished using an EHCO Hard Nose Traveler with Nelson SR 150 Big Gun distributor operated by the City. With the current lease, the irrigation facilities include a variety of delivery systems, all operated by the lessee.

The City has a total of 56 acres for effluent irrigation, although 6.4 acres are currently not configured to irrigate. Per the 2010 Recycled Water Use Plan, a maximum of 27.43 inches of water can be applied annually to irrigate the crops. The City's property has the capability to accommodate 128 acre-feet annually.

Based on mean annual precipitation for the Willamette Valley of 40.78", and mean evaporation of 46.20", the total volume of recycled water that can be applied to 56 acres equates to an average annual daily wastewater flow of 120,300 gpd from the City and Fargo ISD combined, discounting any losses to evaporation.



Typical Effluent Irrigation Field

## 6. Energy Consumption

Energy consumption for the City of Donald's collection, treatment and recycle system should be low in comparison to a conventional treatment system.

The STEP system has approximately 404 connections with a septic tank and 1/2 Hp pump, with the property owners paying for the pump electrical usage. Each pump has a capacity of from 0 to 90 gallons per minute, depending upon the system discharge head.

It would not be unreasonable to assume a pump discharge rate of 15 gpm or less. Under these assumptions each of the current 404 pumps would run for approximately 11 minutes per day, with only an estimated 17 pumps running at any one time. Given these conditions energy consumption is minimal being just a few cents a day, and is paid by each private service owner as part of their monthly power bill.

Energy consumption for the operation of the wastewater treatment facility and irrigation system is also low. The wastewater treatment facility site includes office space and maintenance facilities and a facultative lagoon treatment system. The only mechanical component of the system is the 15 Hp irrigation pump which only operates during the irrigation season. The Big Gun equipment also requires fuel during the irrigation season, but with the current lease, the Big Gun is no longer utilized for irrigation.

Unlike a mechanical treatment facility there is no other mechanical equipment, so energy consumption is only for heating, lighting and operation of buildings in the wet weather season, with the addition of the irrigation pump during the dry season.

### D. Financial Status of Existing Facilities

#### 1. Current Rate Schedule

The current monthly wastewater charges are based on a rate evaluation completed in 2016, which resulted in adopting an increase of 3% per year through fiscal year 2020. The current monthly charge for single family residential sanitary sewer connection is a flat rate of \$33.87 per month. In addition, a Reserve Fund fee of \$2.50 is charged to all users, making the total monthly residential bill \$36.37.

Commercial users are charged a base fee of \$33.87 plus the Reserve Fund Fee of \$2.50, which includes the first 5,190 gallons. Additional water is billed at \$1.91 per 1,000 gallons.

The monthly sanitary sewer rate of \$36.37 equals an annual cost of 0.68% of the Donald 2017 Median Household Income of \$63,889. Commercial users would be charged \$40.78 for 7,500 gallons of flow, or 0.77% of the 2017 median household income.

#### 2. Tabulation of Monthly Users for Fiscal Year 2018 -19

The following table is a summary of the Donald *drinking water* system connections which are used to evaluate wastewater loading data. The water system has a total of 408 service connections. The wastewater system has 4 less at 404.

**Table IV-16: City of Donald  
2018 Municipal Drinking Water Accounts**

	<i>Meter Size</i>					<i>Total</i>
	<i>5/8"</i>	<i>3/4"</i>	<i>1"</i>	<i>1.5"</i>	<i>2"</i>	
Residential Accounts	319	38	2	0	0	359
Commercial/Industrial Accounts	23	2	6	4	0	35
	<b>Total Billed Accounts</b>					<b>394</b>
City Properties	3	3	2	0	0	8
Currently Locked-off	6	0	0	0	0	6
<b>TOTAL CONNECTIONS</b>	<b>351</b>	<b>43</b>	<b>10</b>	<b>4</b>	<b>0</b>	<b>408</b>

At the time of this report preparation, the City had six water service meters locked off, or temporarily closed, due to unit vacancies. Based on the total number and size of drinking water meters, a summary of Equivalent Dwelling Units based on the meter capacity to deliver drinking water is estimated in the following table:

**Table IV-17: City of Donald  
2018 Drinking Water Connection and EDU Summary**

<i>Meter Size</i>	<i>No.</i>	<i>Factor</i>	<i>Total EDU</i>
<b>Residential:</b>			
5/8"	319	1	319
3/4"	38	1*	38
1"	2	1.66	3
Total	359	Total	360
<b>Commercial:</b>			
5/8"	23	1	23
3/4"	2	1*	2
1"	6	1.66	10
1 1/2"	4	3.33	13
Total	35	Total	48
<b>Public/Locked Residential:</b>			
5/8"	9	1	9
3/4"	3	1*	3
1"	2	1.66	3
Total	14	Total	15
TOTAL EDU			423
2017 wastewater loadings, gallons			23,345,000
<b>Gallons per Day per EDU</b>			<b>151</b>

*\*5/8" and 3/4" meters are both assigned capacity factor of 1*

Based on water meter factors and actual flows of 23,345,000 gallons for 2017, the system included a total of 423 Equivalent Dwelling Units with an average wastewater flow of 151 gallons per day per EDU. The average wastewater flows for the past four years was 21,858,250 gallons, which equates to an average loading of 142 gpd per EDU. For a conservative design criteria, projections could be made based on a flow of 150 gpd per EDU. This value based on EDU separates the commercial and industrial usage from residential loads.

In this update, to simplify monitoring future projected loads, the projected *total* flow is divided by the population, which averaged 61 gpd per capita over the past four years, and 65 gpm per capita using 2017 data. To be conservative, average annual flow of 65 gpd per capita will be used in this update. The commercial and industrial loads are included as a component of the residential loads and assumed to contribute in the same approximate current proportion in the future growth of the community.

### 3. Annual Operation and Maintenance Costs

The table below provides the audited numbers for the Wastewater Fund’s resources and requirements for the past three years. The last column is the City’s current budget for fiscal year 2018-2019. In summary, the resources adequately cover the requirements for the regular operations and maintenance. The City maintains an adequate fund balance to ensure continued operations.

**Table IV-18: City of Donald  
Wastewater System Budget**

	<b>Actual 2016</b>	<b>Actual 2017</b>	<b>Actual 2018</b>	<b>Adopted 2019</b>
<b>Resources</b>				
Beginning Fund Balance	\$417,296	\$427,313	\$508,790	\$541,591
Total Revenues	\$268,301	\$337,248	\$342,533	\$347,484
<b>Total Resources</b>	<b>\$685,597</b>	<b>\$764,561</b>	<b>\$851,323</b>	<b>\$889,075</b>
<b>Requirements</b>				
Total Personnel Services	\$131,339	\$139,530	\$146,380	\$181,985
Total Materials & Services	\$84,909	\$78,026	\$97,460	\$197,724
Total Capital Outlay	\$27,440	\$29,286	\$36,596	\$10,410
<b>Total Allocated Requirements</b>	<b>\$243,688</b>	<b>\$246,842</b>	<b>\$280,436</b>	<b>\$390,119</b>
<b>Requirements not Allocated</b>				
Total Requirements not Allocated	\$14,596	\$8,929	\$9,117	\$159,500
Reserved Future Expenditures	-	-	-	\$42,486
Ending Balance	\$427,313	\$508,790	\$561,770	-
Un-appropriated Ending Fund Balance	-	-	-	\$296,970
<b>Total Requirements</b>	<b>\$685,597</b>	<b>\$764,561</b>	<b>\$851,323</b>	<b>\$889,075</b>

In 2016, a rate study was completed, called “The Five-Year Wastewater Capital Improvement Plan”. The rate study analyzed the financial needs for a five-year window. It tackled the costs for short-term projects to serve the current customers. It did not cover projects outside of the study window or capacity related projects (instead these are funded through system development charges). The Council adopted the study's recommended three percent annual increase to maintain current operations.

The City wastewater system is able to support all operating expenses. As of July 1, 2018, the monthly sewer rate for residential customers is a flat \$33.87. The monthly rate for commercial and industrial accounts is \$33.87 with an additional \$1.91 for every 1,000 gallons of water used.

Over the last three years the Wastewater Fund’s ending balance continues to grow, which is indicative of a healthy account. In the table, this can be seen by observing the continued increase in the audited “Beginning Fund Balance”. Between 2016 and 2017 it grew by \$10,017 and then jumped between 2017 and 2018 to a savings of \$81,477. The increase in the beginning fund balance is largely due to the increase in the “Reserved Future Expenditure” line of \$42,486.

In 2014, the City Council instituted a new fee for the sewer account, “Reserved Future Expenditures”. This money is collected to help build a coffer for unanticipated sewer expenses in the future, similar to a “rainy day fund”. As of July 1, 2018, the fee is \$2.50 a month for all account types. It is anticipated that by June 30, 2019 there will be a total of \$31,836 collected. The City Council has not used any of the money since its inception and it requires Council approval to expend it.

The City also maintains a Sewer System Development Fund. These funds are collected when new developments are added to the City and are collected to pay for the additional needed infrastructure to meet the capacity needs. The money is collected as per ORS 223.307. Money is expended according to the Capital Improvement Plan, which was last updated in 2016.

The City currently has an outstanding debt for improvements made to the water and wastewater facilities in 2008. This combined debt was originally \$375,000 in 2008, and has a remaining balance of approximately \$160,000. This debt is funded through a General Obligation Bond with debt service of \$20,565 for FY 18-19, and is scheduled to be paid in full by 2026. This is funded with property tax revenues, but equates to \$4 per month per EDU, for the combined water and wastewater improvement project.

So far, projects from the rate study from 2016 to today are completed such as the collection system valve replacements, roofing and gutter improvements to the control building at the lagoon site, and restoring the rock surfacing around the lagoons. The costs were budgeted and paid with available funds.

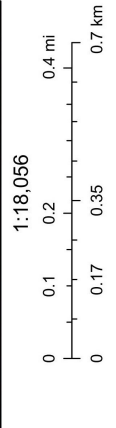
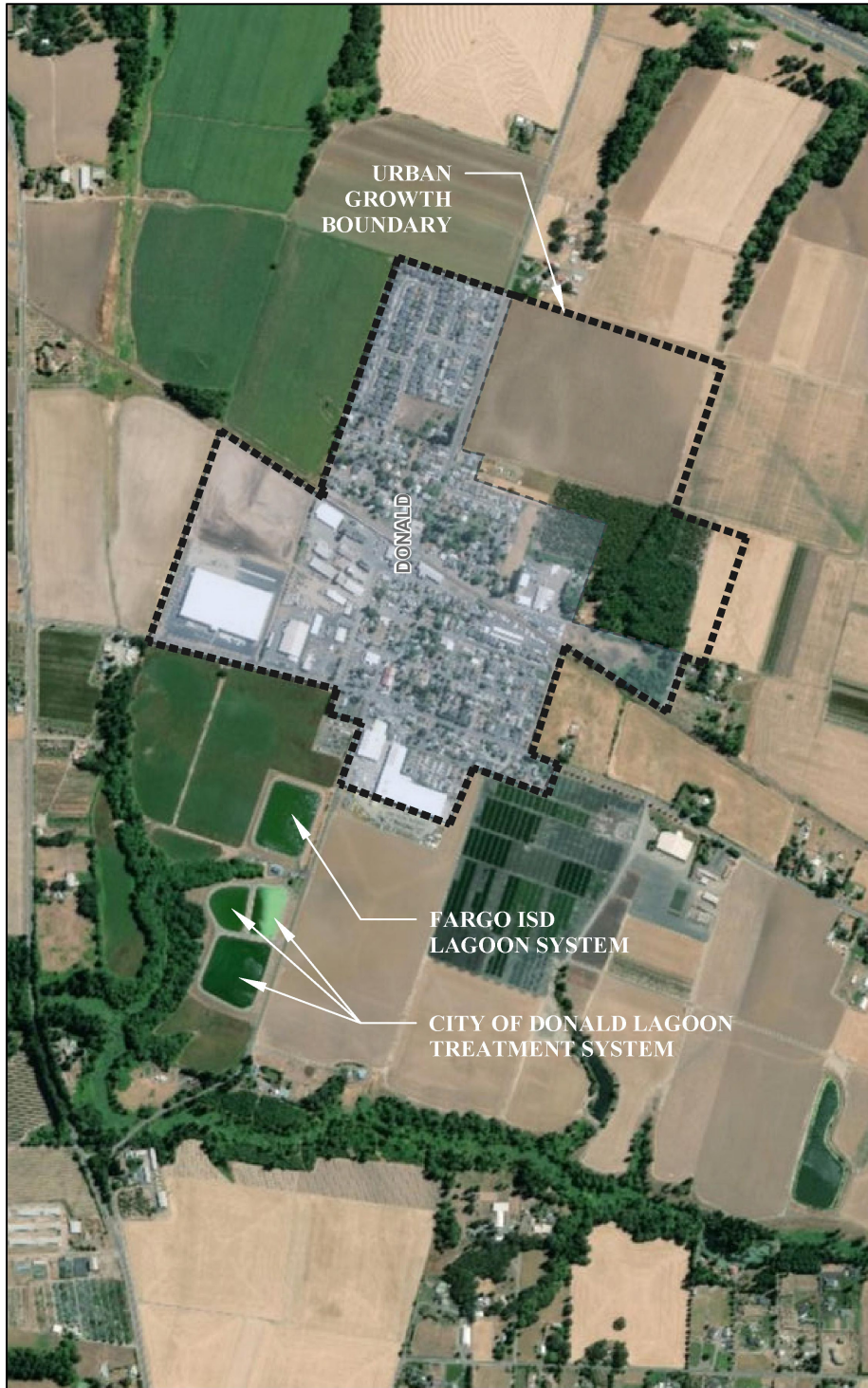
There are few short-lived assets to account for in the wastewater system. The City maintains each septic tank and STEP system, which requires spare parts be available at all times. The pumps require periodic replacement, as well as the valves and controls. The City maintains records of all repairs and replacements, which occur very infrequently.

The following table is a summary of short-lived assets that include costs that would be paid through the operation and maintenance budget as opposed to securing project-based grant/loan funding:

**Table IV-19: City of Donald  
Wastewater Short-Term Asset Summary**

<i>Short Term Assets</i>	<i>Service Life (years)</i>	<i>Ave Remaining Service Life (years)</i>	<i>Replacement Cost 2018</i>	<i>Annual Depreciation Expense</i>
<b><i>Collection System</i></b>				
STEP Pumps & Controls, 404	20	15	\$363,600	\$18,180
STEP Valves, Risers, 404	20	15	101,000	5,050
		<b>TOTAL</b>	<b>\$468,050</b>	<b>\$23,230</b>

ArcGIS Web Map



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus  
Web AppBuilder for ArcGIS  
Marion County | Marion County Oregon | Marion County Planning | MC IT-GIS, MC Planning | USDA FSA, DigitalGlobe, GeoEye, CNES/Airbus DS |

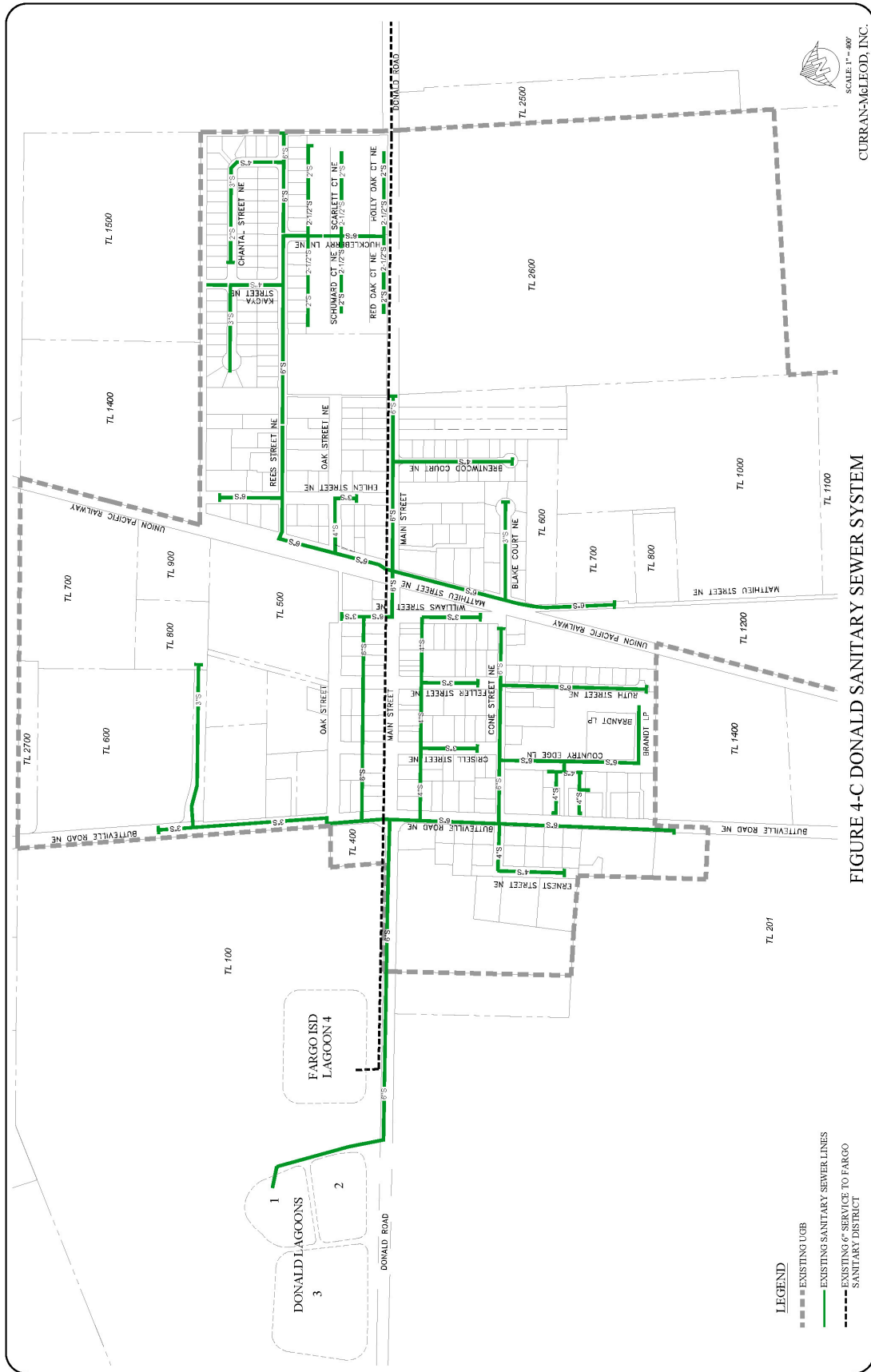
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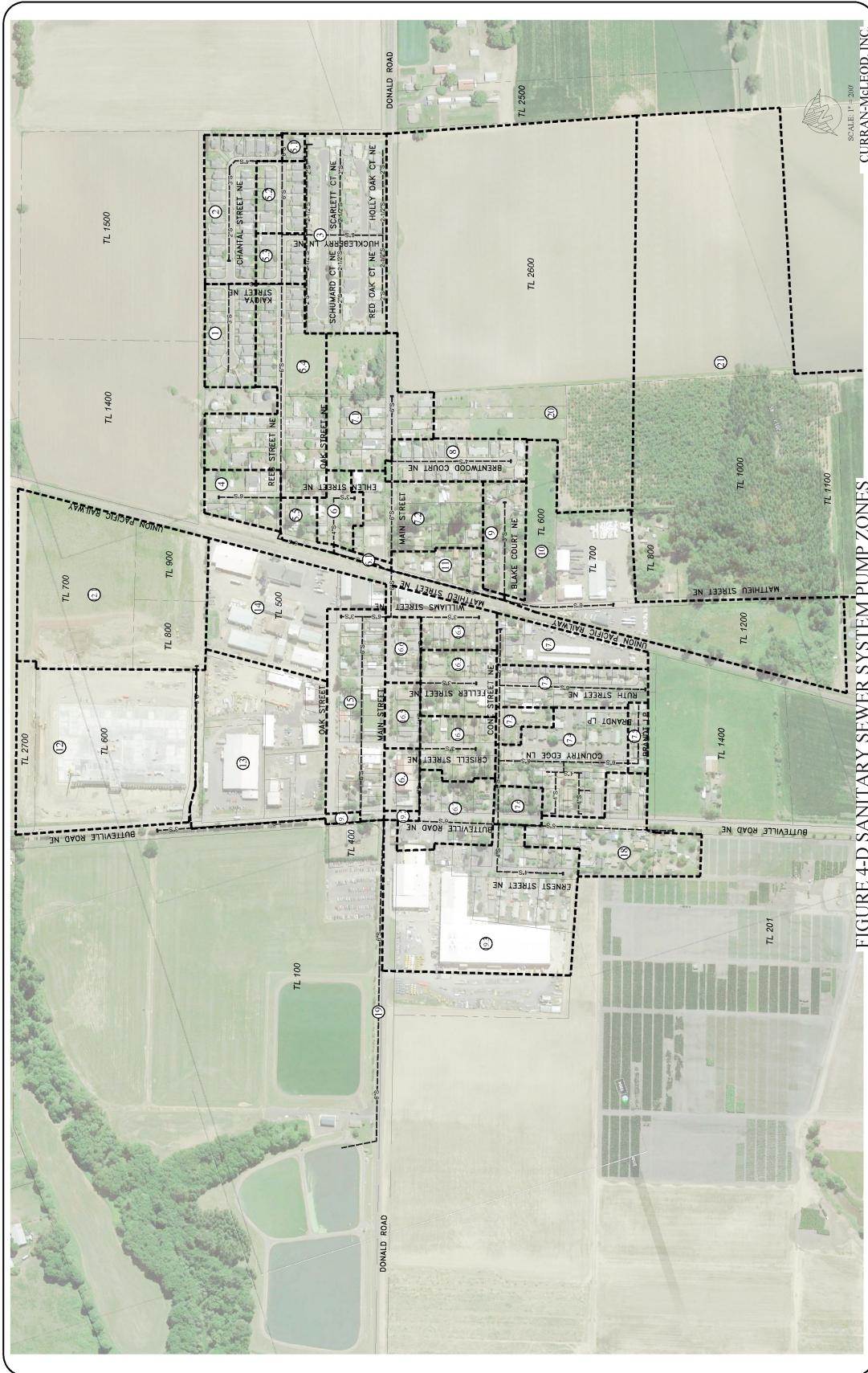
FIGURE 4-A DONALD LAGOON SYSTEM AERIAL PHOTO



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SCALE: 1" = 200'  
CURRAN-MCLEOD, INC.

FIGURE 4-D SANITARY SEWER SYSTEM PUMP ZONES

# CITY OF DONALD WASTEWATER TREATMENT FACILITY HYDRAULIC DESIGN CRITERIA

DESIGN LOADINGS:	PRIMARY LAGOON	SECONDARY LAGOON	STORAGE LAGOON	LAGOON NO. 4	DISINFECTION SYSTEM	IRRIGATION SYSTEM
AVERAGE ANNUAL FLOW PER CAPITA	79,310 GPD					
800 AVERAGE CONCENTRATION	157 MG/L					
TSS AVERAGE CONCENTRATION	110 MG/L					
TSS TOTAL	34 LBS/DAY					
EPA RELIABILITY CLASS	EXCLUDED					
SEPTAGE						
INFLUENT METERING (LAGOON NO. 1)	6" MAG METER					
INFLUENT METERING (LAGOON NO. 4)	6" MAG METER					
REQUIRED EFFLUENT	9'-6" 7'-0"					
WINTER	14.55 AF 2.5 AC					
SUMMER IRRIGATION	9'-6" 14.29 AF 2.3 AC					
TOTAL COLIFORM						
CLASS C: A MEDIAN OF 23 TOTAL COLIFORM ORGANISMS PER 100 M.L. SAMPLE, NO MORE THAN 5 PERCENT OF WHICH ARE CLASS B. ANALYSES HAVE BEEN COMPLETED.						
CLASS D: A 30-DAY LOG MEAN OF 126 E. COLI ORGANISMS PER 100 M.L.						
CLASS E: COLI ORGANISMS PER 100 M.L. IN ANY SINGLE SAMPLE.						
TYPE	SODIUM HYPOCHLORITE					
CONTACT TIME @ 400 GPM	50 MINUTES					
NUMBERS OF PUMPS	1					
HORSEPOWER	240V/3-PHASE/80 HZ					
POWER CAPACITY EACH PUMP	400 GEM					
IRRIGATION SITE	58 ACRES					

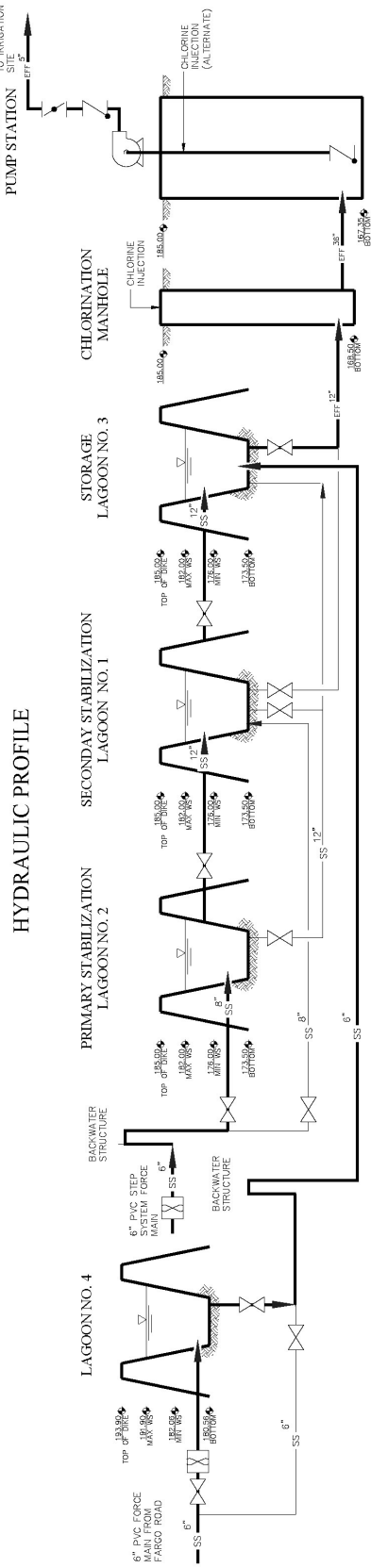


FIGURE 4-E LAGOON HYDRAULIC PROFILE & DESIGN CRITERIA

CURRAN-MCLEOD, INC.

## **V. NEED FOR THE PROJECT**

### **A. Health, Sanitation and Security**

The existing wastewater system has been effective at conveying, treating and disposing of the City's domestic wastewater, although there have been three periods when the lagoons have reach capacity prior to the irrigation season. The City was authorized to irrigate treated effluent out of season three times, from 3/14/2016 to 3/21/2016, 3/13/2017 to 3/17/2-17, and 4/17/2017 to 4/21/2017. There has been no risk to the public health or other sanitation issues.

The existing STEP systems are located on individual private properties with right of access for the maintenance of each system by City personnel. Access to the septic tanks is limited to City personnel and not the general public.

The treatment facility site is enclosed with a 6-foot-high fence to prevent access to the structures and lagoons. Access to the site is controlled by an automated gate and the site has a security system to notify the City of any intrusions. There are no security issues associated with the wastewater collection or treatment facilities.

### **B. Aging Infrastructure**

The Donald sanitary sewer system is relatively new and in very good condition. The collection system includes septic tanks, individual effluent pumping station and small diameter force mains all maintained as scheduled and inspected on a five-year cycle. The analysis completed earlier in this report concluded that neither the City of Donald or the Fargo Interchange Service District exhibit excessive infiltration or inflow. The sewage lagoons, operations building, chlorination building and effluent recycle pumping station building are all in very good condition.

### **C. Reasonable Growth**

#### **1. Lagoon Organic Treatment System**

Wastewater loading from the City of Donald is anticipated to increase as the population and commercial/industrial developments occur. Flows based on 65 gallons per capita, which includes a component for commercial/industrial flow, are projected to be an average annual flow of 110,825 gallons per day at a population of 1,705 in the year 2040.

STEP systems deliver only septic tank effluent, so the organics, solids and the fats, oils & grease (FOG) are greatly reduced from typical municipal waste. A properly sized septic tank is estimated to remove 65 to 80% of the BOD, 75 to 95% of the TSS, and reduce FOG by 85 to 95%.

To be conservative, the BOD loading used for this update is 150 mg/L, and TSS is 75 mg/L. At the design population of 1,705, BOD loading is estimated to be 140 pounds per day, and TSS is 70 pounds per day. Stabilization Cell 1 and Cell 2 have a capacity of 125 pounds of BOD per day, each. TSS treatment capacity is much larger due to the volume available to store solids in a lagoon. In summary, neither BOD or TSS impact the design.

Current and future organic treatment loads can continue to be discharged into Cell 1, however, anticipating topography challenges and continuing growth beyond the planning window, it would be proactive to discharge the influent sewers into the new larger Lagoon 5. Lagoon Number 5 is proposed to be aligned due north of Lagoon Number 4, in order to provide the benefit of a common dike and maximize the buffers to adjacent developable lands. The proposed lagoon site is shown on Figure 4-B.

The 2015 Wastewater Lagoons Storage & Capacity Analysis identified annual flow for the Fargo ISD of 15.23 million gallons, or an average of 41,700 gallons per day. Over the past four years the average flow has increased based on the Fargo ISD meter at the lagoon site, to an average annual flow of 46,900 gpd.

The 2015 Capacity report also projected buildout of the only remaining 25.3 acres undeveloped property in the District as adding 1.466 million gallons of flow annually, or an additional 4,000 gpd, for a total flow from the Fargo Interchange Service District of 16.7 million gallons annually or an average annual flow of 51,000 gallons per day.

At buildout of the Fargo ISD, the projected BOD load is estimated at an average of 106 pounds per day, or 21 pounds of BOD per acre in Cell Number 4, which can easily be accommodated.

## **2. Lagoon Storage Systems**

The more significant need for the City and Fargo ISD lagoons is storage during the wet weather months prior to irrigation during the dry weather months. Over the past four years, the volume of the City's wastewater collected during the wet weather period has steadily increased from 54% of total annual flows in 2014 to 59% in 2017. For design, 60% of the annual flow is anticipated to be stored during the wet weather months.

At a design per capita contribution of 65 gpd, which includes commercial and industrial components, future growth of the City will increase annual flows to an estimated annual average of 110,825 gpd at a population of 1,705. This equates to a total annual volume of 40.44 million gallons, or 124.1 ac ft. Storage is required to accommodate 60% of the annual flow, which equates to a storage need for 24.26 million gallons, or 74.5 acre-feet for the wastewater alone, without the impact of precipitation or evaporation.

The storage volume needs to be increased to account for the mean wet weather period precipitation of 30.21" as documented by the OSU Agricultural Experiment Station, 1993 Climate of Oregon Climate Zone 2 Willamette Valley. Additionally, the storage volume can be reduced to account for the 10.72" of wet weather period mean pan evaporation in the Willamette Valley as documented by the 1982 NOAA Mean Monthly, Seasonal, and Annual Pan Evaporation for the United States. These adjustments, when applied to the 10 acres of existing lagoons and projected 7 acres in the new Lagoon Number 5, add an additional 27.6 ac ft of required storage.

The storage requirement for the Donald lagoons is 74.5 acre-feet of wastewater plus 27.6 ac ft of precipitation/evaporation, for a total of 102.1 ac ft to be stored through the wet weather months. This requires an additional 39.6 ac ft of storage beyond the existing storage volume of 62.5 ac ft. Based on the average volume of available storage of approximately 6.2 acre-feet per acre of the existing lagoons, a minimum of an additional 6.4 acres is required.

Similar to the City's lagoons, the major design criteria for the Fargo ISD Lagoon is to provide sufficient storage through the winter months for irrigation in the dry weather months. Flow records for the past four years indicate the wet weather flows have varied from 54% to 68% of the total annual flow. Both of these appear to be outliers related to metering issues in 2016-17. For this analysis, 60% of the annual flow will be projected to be stored during the wet weather season for the Fargo ISD.

The Fargo lagoon has an available storage volume of 38.1 ac ft. The buildout average annual flow is projected to be 51,000 gpd or 18.6 million gallons annually. 60% of the annual flow equates to 11.2 million gallons, or 34.3 ac ft. The mean wet weather precipitation of 30.21" and evaporation of 10.72" over the 5-acre lagoon adds an additional 2.65 million gallons annually, or 8.1 ac ft.

Total storage requirement for the Fargo ISD is 34.3 ac ft plus 8.1 ac ft, for a total of 42.4 ac ft. This exceeds the available capacity of 38.1 ac ft by 4.3 ac ft.

A new lagoon will need a storage volume of 39.6 ac ft for the City of Donald. If the Fargo ISD deficiency is incorporated into the City's lagoon, an additional 4.3 ac ft will bring the total storage required to 43.9 ac ft. Based on the average of 6.2-ac ft of storage per acre from the existing City lagoons, 43.9 ac ft of storage will require construction of a minimum 7-acre lagoon.

Typical operation of the lagoon should not depend upon dewatering to the minimum level, and filling to the maximum level, and dependence upon 100% of the effluent irrigation being completed each season. The new lagoon should be conservatively sized to allow variation in each of these processes. The incremental cost of a larger lagoon is much lower than the cost of an additional lagoon in the future.

To provide flexibility for future loading or seasonal impacts, this planning update recommends the new lagoon be sized to accommodate 60 ac ft and be a nominal 10 acres at maximum water depth. The proportionate share of the volume benefitting the City of Donald would be 55.7 ac ft, with 4.3 ac ft included for the Fargo ISD, or a 92.8% and 7.2% allocation.

### **3. Effluent Recycle**

Projected average day loading for the City of 110,825 gpd (68.5%) and Fargo ISD of 51,000 gpd (31.5%), totals an average annual flow of 161,825 gpd. Annually this equates to 59.1 million gallons, or 181.2 acre-feet.

Mean annual precipitation of 40.78", and mean evaporation of 46.20" over the total future 22 acres of lagoons, reduces the total volume to be recycled by 10-acre feet.

The total volume of recycle water at the end of the planning window is projected to be 171.2 ac ft with the combined Donald and Fargo ISD flows. This volume of recycle applied at 27.43" per year as detailed in the 2010 Recycled Water Use Plan, will require a total of 75 acres of irrigation area. To irrigate a total of 171.2 ac ft at the current irrigation pump capacity of 400 gpm, would require operating continuously approximately 100 days each season.

The City has a total of 56 acres that can be used for effluent irrigation, although currently only 49.6 acres have the infrastructure in-place to irrigate. At the end of the planning window, a minimum of an additional 19 acres, for a total of 75 acres will be required for effluent recycle. Of this total, 68.5% is required for the City of Donald and the remaining 31.5% is required for the Fargo ISD.

## VI. ALTERNATIVES CONSIDERED / PROPOSED PROJECT

Based on the adopted population projections, the City's service population is estimated to increase by 75% by the year 2040, to a total of 1,705 residents. The following table projects the average daily flows based on population for the City at 65 gallons per day per capita, and the built-out flow from the Fargo ISD, projected to occur over the next few years:

**Table V-1: City of Donald  
Lagoon Average Daily Flow Projections**

<i>Year</i>	<i>Population</i>	<i>City Flow (gpd)</i>	<i>Fargo Flow (gpd)</i>	<i>Total Flow (gpd)</i>
2018	985	64,025	46,800	110,825
2020	1,011	65,715	48,750	114,465
2025	1,172	76,180	51,000	127,180
2030	1,355	88,075	51,000	139,075
2035	1,555	101,075	51,000	152,075
2040	1,705	110,825	51,000	161,825

### A. Collection System Improvements

As noted earlier, in 1983 the City elected to use a STEP collection system and facultative lagoons for treatment and storage. As a result, an evaluation of alternative collection or treatment systems is very limited. The City is committed to the continued use of a STEP

collection system and facultative lagoon treatment through the planning period, and the system will continue to be efficient and cost effective.

Consideration was given to constructing a second lagoon treatment facility in the southeast quadrant of town, where the new residential growth will occur, but was determined to not be a viable option due to the capital and operating costs, land requirements, and permitting efforts, versus continued use of the existing lagoon site.

Future extensions to the collection system should follow the pipe sizing table provided in the collection system evaluation section of this plan update. The cost of all collection system improvements will be the responsibility of private development under the direction of and with approval by the City of Donald.

## **B. Lagoon Treatment & Storage - CIP Project 1**

The City of Donald and Fargo ISD lagoons both have sufficient capacity to treat the future projected wastewater organic loading but do not have adequate volume of lagoon storage. The projections indicate the City needs an additional 39.6 ac ft of storage. The Fargo ISD needs an additional 4.3 ac ft beyond the existing capacity. These volumes assume the existing lagoons are dewatered to an elevation of 2.5' at the end of each irrigation season and filled to a maximum of 2 feet below the top of the berms.

The design for additional storage is based on a new nominal 10-acre lagoon with a depth comparable to the existing City lagoons. This additional lagoon can feasibly be placed on the existing lagoon site, immediately north of the existing Fargo ISD lagoon to take advantage of a common dike and be connected with the existing piping on-site. This configuration would retain the irrigation function for the remaining adjacent areas.

The new lagoon would tentatively be the same width as the Fargo ISD lagoon, and would extend approximately 850 feet north of Lagoon 4 as shown on Figure 4-B. The ground elevations vary from 188 sloping down to approximately 175-foot elevations.

The new cell would have a water surface higher than the existing City lagoons, as needed to balance the earth work. Matching the City lagoon's berm elevation results in an approximate 60,000 cubic yard of surplus excavated material, whereas matching the Fargo ISD lagoon berm elevation results in a shortage of approximately 80,000 cubic yards of fill material. The finished berm elevation will need to be somewhere between the two existing berm elevations.

Future piping modifications should re-sequence the lagoons to discharge all of the City's waste flow first to the new lagoon, and then return by gravity sequentially through existing cells 1, 2 and 3. This would provide surplus organic treatment and minimize the potential of overloading the existing primary cell. The influent pipe size should be increased to 8" to minimize head loss in the force main on any new extensions required.

The Fargo ISD cell has experienced short circuiting which potentially impacts treatment. At the time of design, consideration should also be given to relocate Lagoon Number 4 inlet pipe further east of its current location.



Expansion of the existing lagoon site would have minimal impact on the area. Natural drainage ways can be avoided and the area has a 600 - 700-foot buffer to the border of the City limits. The nearest properties within the City limits/Urban Growth Boundary are zoned for commercial or industrial development. This buffer and zoning would minimize the potential for conflict with residential areas of the City.

**Table V-2: City of Donald  
Estimated Costs of Lagoon Number 5**

<i>Item</i>	<i>Quantity</i>	<i>Units</i>	<i>Unit Price</i>	<i>Total</i>
Mobilization, Bonding & Insurance,	1	LS	\$50,000	\$50,000
Common Excavation	50,000	CY	6	300,000
Common Embankment	50,000	CY	6	300,000
Bentonite Liner	60,000	SY	2	120,000
Site Piping	1	LS	100,000	100,000
Outlet Structure	1	LS	60,000	60,000
Rock Surfacing	1,000	CY	25	25,000
Rip Rap Protection	3,000	CY	25	75,000
Security Fencing	3,000	LF	40	120,000
Irrigation Site Restoration	1	LS	25,000	25,000
<b>Estimated Construction Cost</b>				<b>\$1,175,000</b>
Engineering (15%)				176,250
Contingency (25%)				293,750
<b>Total Project Cost</b>				<b>\$1,645,000</b>
City of Donald Proportionate Share (92.8)				1,526,560
Fargo ISD Proportionate Share (7.2)				<b>\$118,440</b>

**C. Effluent Chlorination - CIP Project 2**

The effluent disinfection and chlorine contact chamber will be adequate to treat future recycle flows. With the potential of two pumps operating and total flow of 800 gpm maximum, the chlorine contact pipeline would still provide 25 minutes of contact time, which would be adequate, potentially with an increased chlorine dosage.

The only modification to the chlorination building is to add spill containment and a chemical scale to simplify documenting the chlorine use. This work can easily be completed in-house.

**Table V-3: City of Donald  
Estimated Costs for Disinfection System Improvements**

<i>Item</i>	<i>Quantity</i>	<i>Units</i>	<i>Unit Price</i>	<i>Total</i>
Chlorine Platform Scale	1	LS	\$6,000	\$6,000
Spill Containment	1	LS	4,000	\$4,000
Electrical & Installation	1	LS	2,000	\$2,000
<b>Estimated Cost</b>				<b>\$12,000</b>

#### D. Recycle Pump Station - CIP Project 3

The effluent pump station should be expanded to include a second pump to increase the volume of water that can be irrigated daily. The existing wet well is adequately sized to install a second pump suction line. The building roof should be modified to provide a system to easily remove the suction pipe and strainer for both pumps when needed for servicing.

**Table V-4: City of Donald  
Estimated Costs of Reuse Pump Station Improvements**

<i>Item</i>	<i>Quantity</i>	<i>Units</i>	<i>Unit Price</i>	<i>Total</i>
Mobilization, Bonding & Insurance	1	LS	\$6,000	\$6,000
Second Irrigation Pump	1	Ea	20,000	\$20,000
Mechanical Piping	1	LS	20,000	\$20,000
Electrical Service	1	LS	10,000	\$10,000
Building Modifications	1	LS	4,000	\$4,000
<b>Estimated Construction Cost</b>				<b>\$60,000</b>
Engineering				5,000
Contingency				5,000
<b>Total Project Cost</b>				<b>\$70,000</b>

#### E. Irrigation Site Expansion - CIP Project 4

An additional 19 acres of irrigated area is required to provide the 75 total acres required to recycle the flow in the design year. Additionally, the new 10-acre Lagoon Number 5 will displace approximately 12 acres of the current irrigation site. Setbacks to drainage ways, public rights-of-way and public access further restrict the irrigation areas. A minimum of 35 acres of additional irrigation site should be secured to support growth through the planning window.

The area surrounding the lagoon site should be explored to identify potential sites where the City could supply Class C or Class D water for farm crops that comply with the recycle regulations. The City has previously contacted many of the nearby property owners without success but should expand the inquiries until a site is located.

Class C effluent per ORS Chapter 340 Division 55 is required to be oxidized and disinfected, and must not exceed a median of 23 total coliform organisms per 100 milliliters, based on results of the last seven days that analyses have been completed, and 240 total coliform organisms per 100 milliliters in any two consecutive samples.

Class C effluent may be applied to firewood, ornamental nursery stock, Christmas trees, sod, or pasture for animals, irrigation of processed food crops, irrigation of orchards or vineyards (if an irrigation method is used to apply recycled water directly to the soil), landscape irrigation of golf courses, cemeteries, highway medians, or industrial or business campuses, industrial, commercial, or construction uses limited to industrial cooling, rock crushing, aggregate

washing, mixing concrete, dust control, nonstructural fire fighting using aircraft, street sweeping, or sanitary sewer flushing;

If an irrigation method is used to apply recycled water directly to the soil, there must be a minimum of 10 foot setback from the edge of the site used for irrigation and the site property line. Where sprinkler irrigation is used, there must be a minimum of 70 foot setback from the edge of the site used for irrigation and the site property line.

There must also be a minimum of 100 feet setback from the edge of an irrigation site to a water supply source used for human consumption. Where sprinkler irrigation is used, recycled water must not be sprayed within 70 feet of an area where food is being prepared or served, or where a drinking fountain is located.

Although difficult to find, another option is to purchase an existing parcel which would ensure the City has permanent capacity to recycle lagoon effluent through the planning window. The site could be leased to a local farmer to remain in production, as is done with the current irrigation site. Ideally, it would be desirable to have flat, cleared land that has limited water supplies.

The existing 5" PVC force main is adequate for the existing irrigation fields but will not service any new sites. A minimum 6" PVC or HDPE force main should be installed to any new irrigation sites, the size being dependent upon the distance to the new site.

**Table V-5: City of Donald  
Estimates of Irrigation Site Expansion**

<i>Item</i>	<i>Quantity</i>	<i>Units</i>	<i>Unit Price</i>	<i>Total</i>
Mobilization, Bonding & Insurance	1	LS	\$15,000	\$15,000
6" Force Main Construction, per mile	5,280	LF	60	\$316,800
<b>Estimated Construction Cost</b>				<b>\$331,800</b>
Engineering (15%)				50,000
Contingency (25%)				83,200
Recycled Water Use Plan Update				5,000
<b>Total Project Cost</b>				<b>\$470,000</b>
<b>City of Donald Proportionate Share</b>			<b>68.5%</b>	<b>\$322,000</b>
<b>Fargo ISD Proportionate Share</b>			<b>31.5%</b>	<b>\$148,000</b>

The estimate of cost is for one mile of force main and does not include the purchase of any additional land. If there is an opportunity to purchase land for treated effluent irrigation, based on previous sales, the cost is estimated to be \$10,000 to \$25,000 per acre within a mile from the lagoon site. The majority of the properties closest to the lagoons are currently cultivated and based on previous sales would be higher cost estimated at \$25,000 to \$40,000 per acre.

**F. Instrumentation and Control SCADA Improvements - CIP Project 5**

A Supervisory Control and Data Acquisition (SCADA) system is needed City-wide to monitor and control the water and wastewater systems. Communications should be established

between the wastewater facility and at the water treatment facility. Facility Planning for the water system includes a similar SCADA capital improvement project at the Water Treatment Plant site. The central hub for the SCADA system will need to be at the Water Plant due to the logic controls required at the plant. Remote monitoring and controls can be located at the Wastewater Plant.

The cost for the SCADA central hub is estimated at \$60,000 and is included in the water system Capital Improvement Plan. The cost to connect the Wastewater Plant to the system is estimated at \$25,000.

**G. Facilities Planning and SDC Methodology - CIP Project 6**

Maintaining a current facilities plan and SDC methodology is important through the entire planning window. Future facilities plan updates will be required every five to ten years depending upon the volume of development in the City. The System Development Charge methodology and fees should be reviewed annually and updated as needed. The total planning costs estimated for the 20-year planning window is \$40,000.

**H. Capital Improvement Plan Summary**

The existing system can accommodate an annual average daily flow of 115,000 to 120,000 gpd before improvements are required, however, securing a funding program and completing the engineering design should be completed early to avoid delays.

The lagoon construction should be delayed until the end of the construction season in 2021 or spring of 2022 to accommodate harvest of the nursery stock on-site. The remaining capital improvements should be undertaken as soon as funding is available.

The following table summarizes all capital improvements for the wastewater system and provides an estimated timeline for implementation.

**Table V-6: City of Donald  
Capital Improvement Plan Summary**

<i>No.</i>	<i>Project</i>	<i>1 - 5 Years</i>	<i>1-20 Years</i>
1	Lagoon No. 5	\$1,645,000	
2	Effluent Disinfection	\$12,000	
3	Recycle Pump Station	\$70,000	
4	Recycle Irrigation Site*	\$470,000	
5	SCADA System	\$25,000	
6	Planning & SDC Updates		\$40,000
	<b>TOTAL</b>	<b>\$2,222,000</b>	<b>\$40,000</b>

*\*Effluent irrigation site costs are based on one mile of force main. Irrigation sites are anticipated to be leased from local landowners who can develop a beneficial use for the recycled water. If the City purchases land, the land cost would be in addition to the costs estimated above.*

## **I. Operation & Maintenance**

Implementing the capital improvements will have minimal impact on the operation and maintenance of the wastewater system. The larger lagoon system will have some minor impact on the time required to inspect and maintain the additional 10 acre lagoon. All operations are passive with no additional tasks required of the operators. Future summer recycle operations could mandate additional efforts, depending upon the agreement made with a farm operation to accept the recycled water.

No additional training would be required to operate the expanded lagoon or irrigation system. Expansion of the lagoon system and land application irrigation sites will utilize the same skill set, certifications and operational knowledge as the existing system.

The addition of a SCADA system will improve monitoring efforts but have minimal impact on operations of the wastewater system.

## **J. Permit Issues**

The existing WPCF permit should not require any substantial amendments to incorporate the expansion of the lagoon treatment system or the irrigation sites. An updated Recycled Water Use Plan will be required prior to irrigation on any new sites. Monitoring and reporting requirements should remain the same.

A biosolids management plan will be required when sludge removal is warranted from any of the lagoons, however, sludge removal is not anticipated to be warranted within this planning window.

The collection system is limited to area within the Urban Growth Boundary, however, the force main discharges to the wastewater lagoons that are located outside of the UGB, in land zoned as Exclusive Farm Use. The lagoons are located on Township 4 South, Range 1 West, of the Willamette Meridian, in Section 18 on Tax Lot 0100, under Marion County jurisdiction, immediately adjacent to the UGB.

Per the Marion County Code Chapter 17.136, EFU zone requirements allow utility facilities that serve the public, subject to standards. Additionally, utility improvements outside of the UGB require compliance with OAR 660-033-00120, Land Conservation and Development Department, Agricultural Land requirements. This will require a review to secure approval to expand the facilities. As a result, a Land Use Compatibility Statement is not included with this planning update, but will be secured with the funding application or at the time plans are submitted to DEQ.

Per OAR 660-033-0130 (2)(c), the administrative rules indicate existing facilities wholly within a farm use zone may be maintained, enhanced or expanded on the same tract subject to other requirements of the law. This provision provides reasonable assurance of a path to approval to expand the lagoon system. This expansion would most likely be on previously disturbed land which will minimize any environmental review required.

## VII. FUNDING PROGRAM

### A. State Housing Initiative

In 2018 the City of Donald and GK Machine, Inc. (GGP, LLC.) submitted a joint proposal to the State of Oregon Department of Housing and Community Services (OHCS) through the Workforce Housing Initiative. As a result, the application was approved and grant funds were awarded to both the City of Donald and GK Machine, Inc. (Gary Grossen Properties, or GGP LLC), will manage the engineering and initial infrastructure portion of the grant funds that will lead GGP to construction of a number of workforce housing units.

The Oregon Workforce Housing Initiative grant included the following:

<b>Grantee (City of Donald)</b>	<b>Funds</b>
Pre-development engineering design costs for the water and/or wastewater treatment facility and/or construction upgrades	\$195,000 (Oregon Housing & Community Services)
<i>Cost for constructing the wastewater and/or water facilities</i>	<i>\$330,000 (Business Oregon)</i>
<b>GK Machine, Inc.</b>	<b>Funds</b>
Offer employees a 12-month rent reduction when moving to Donald and down payment assistance to GK Machine Inc., employees when they purchase a home in Donald	\$100,000 (OHCS Match)
Final engineering design costs – pre-development costs	\$150,000
<b>Combined Total Funds Requested for the Pilot Project:</b>	<b>*\$775,000</b>

Implementation of the capital improvement plan will require the City of Donald to secure the remaining funding needed from governmental or private agencies, through a grant/loan program. Prior to incurring additional debt for wastewater system improvements, the City will need to comply with the provisions for debt limitation in the City Charter, Chapter X, Section 41. This charter provision limits bonded indebtedness to \$25,000 except as approved by the voters.

Any debt should be able to be retired through System Development Charges resulting from anticipated growth. System Development Charge revenues are dependent on growth, which is not assured; thus, SDC revenues similarly are not assured. As a result, property taxes or user fees alone must be used to demonstrate the City's ability to support debt.

The System Development Charge methodology was last updated in January of 2016. With this updated capital improvement plan, the SDC should be reviewed and adjusted accordingly. If development occurs as anticipated, the SDC revenues will be adequate to retire a substantial amount of the debt for all improvements. The logistics of SDC cash flow will be problematic. SDC revenues are typically collected as building permits are issued; however, the infrastructure capacity needs to be in-place before permits are issued.

## **B. Marion County Funding Requirements**

Prior to creating a funding program, the intergovernmental agreement between Marion County and the City of Donald should be re-evaluated to address the current capital and operating costs associated with the Fargo ISD. Capital improvements listed in the Capital Improvement Plan identify a Fargo ISD direct cost of \$118,440 for their 7.2% of the lagoon construction, and \$148,000 for 31.5% of the irrigation site expansion, for a total of \$266,440. This equates to 12% of the total \$2,222,000, 1 - 5-year priority Capital Improvement Plan.

## **C. Funding Balance**

Deducting the Housing Initiative Program Grant and the Fargo ISD capital costs, reduces the total \$2,222,000 to a balance of \$1,505,560. Based on a 4%, 30-year debt of \$1,505,560, the annual debt service would be approximately \$87,000 per year. Additionally, the City would need to collect a 10% reserve, or an additional \$8,700 per year for 10 years, if required by the funding agency.

There are a variety of funding mechanisms available to the City:

### **1. General Obligation Bonds**

General Obligation Bonds are the traditional means of funding capital improvements that benefit the entire community. GO bonds require a positive vote from the community, and the debt service is allocated based on property valuations and collected with annual property tax payments. Annual debt service of \$87,000 would equate to approximately \$0.945 per \$1,000 assessed value, and the \$8,700 reserve would be an additional \$0.095 per \$1,000 value, based on the \$92,082,013 current assessed value of the City.

The cost allocation with GO bonds impacts all residents with guarantee of the full faith and credit of the City. Because capital improvements are primarily to benefit future users, GO bonds are not the most equitable for the City residents.

## **2. Revenue Bonds**

Revenue bonds require a commitment of user fees to retire debt. This revenue stream is guaranteed by the City's commitment to collect sufficient user fees to retire the debt, which again is allocated to all users as opposed to only future users. In that the capital improvements are primarily to benefit future users, this allocation is similarly not the most equitable for the City residents.

Based on the current approximate 423 EDU and annual debt service of \$87,000, the user rates would increase by approximately \$17.14 per month, plus an additional \$1.71 for a reserve, if required.

## **3. Governmental Grant/Load Programs**

Oregon Business Infrastructure Finance Authority Water Wastewater program, USDA Rural Development Water and Waste Disposal Loan and Grant Program, and the Oregon DEQ Clean Water State Revolving Fund program commonly provide funding for municipal wastewater projects. Each program has attributes that would benefit the City of Donald. The City should qualify for grants and loans to cover any remaining project costs.

## **4. System Development Charges**

System Development Charges can collect sufficient revenues to cover the total cost of the improvements, however, SDC collections are made at the time of issuing building permits as opposed to completing the capital construction. Capital improvements are primarily benefitting future growth. If debt service can be paid from SDC revenues, this is the most equitable to the City residents.

SDC revenues are not assured, so cannot be used as a primary debt service source when applying for funding assistance. SDC funds can, however, be used to make the annual debt service payments for any funding agency, if SDC revenues are available. The City currently has an SDC fund balance of approximately \$250,000 that can be applied to these projects.

An alternative use of SDC funds was proposed in the joint application prepared by the City of Donald and GK Machine, Inc. (GGP, LLC) and submitted to the Oregon Workforce Housing Initiative. This application anticipated the bulk of the project cost would be funded with private development funding and reimbursed with System Development Charge credits.

GGP, LLC. has proposed to develop new housing units, which at the current SDC rates would generate approximately \$1,575,000 in SDC revenues. To utilize these funds, GGP, LLC. proposed to undertake construction of the facilities with private forces in exchange for the credits. This arrangement can be very beneficial to the community, and potentially eliminate the need for any capital improvement financing. The City should explore this opportunity before applying for any additional program funding.



#### **D. Recommended Funding Program**

The City of Donald should work cooperatively with GGP, LLC. to determine how the improvements can be completed using SDC credits. The project is an SDC eligible public improvement, and GGP, LLC. is permitted to complete the improvements without the City being a party to the construction contract. The design should be controlled by the City to ensure that the improvements meet all of the City's needs.

#### **E. Scheduling**

The City's wastewater lagoons have a capacity to support an annual average daily flow of 68,800 gpd. Current annual average daily flow is 64,000 gpd. The lagoon construction will be required with the addition of approximately 75 additional residents. Based on the population projections, this will be within the next 3 - 4 years.

Current loading on the Fargo ISD Lagoon Number 4 is over the available storage capacity. Current flows of 46,900 gpd are approximately 2,300 gpd over capacity, resulting in a storage deficiency of approximately 1.5-acre feet. This equates to a level increase over all 15 acres of the existing lagoons of 1.2" at the end of the wet weather storage period. This volume is not sufficient to accelerate the construction schedule but will need to be closely monitored.

With a total of 56 acres of land available for irrigation, the existing irrigation area is adequate for 128-ac ft of recycled effluent. The current annual recycle amounts to approximately 117-ac ft.

The City currently leases the irrigation site to a nursery operation that currently has a minimum three-year crop cycle. To allow harvesting the current crop, the wastewater capital improvements should be scheduled to begin no earlier than late fall of 2021, following the harvest of the stock on the proposed lagoon site.

To ensure that the improvements are completed when increased loads are applied to the system, the City should take preliminary steps to secure the project funding. To initiate this process, the City should schedule a One-Stop meeting with Oregon Business Infrastructure Finance Authority, which will provide access to each funding agency at a common meeting. The City can present the improvement program to all funding agencies and evaluate what programs would be best for the community.

