Hartstene Pointe Water/Sewer District

General Sewer Plan

October 2022

Prepared by:

CENTURY WEST ENGINEERING

General Sewer Plan

Refined Alternatives Analysis

The Hartstene Pointe Water/Sewer District is pursuing funding under USDA-Rural Development (RD) and Washington State Department of Ecology (ECY) programs for a wastewater project involving refurbishment of approximately 22,300 linear feet of sewer main, 33,500 linear feet of side sewers, and relocation of 2,200 feet of threatened sewer main. As a required condition of that funding programs, the District must provide a General Sewer Plan (GSP) meeting the requirements of USDA-RD and ECY. The following is a listing of key data points relevant to this project:

A. Total Connections: 445

B. Residential Connections: 445

C. Commercial Connections: 0

D. System ERUs

    a. Residential ERUs: 445

    b. Commercial ERUs: 0

E. Current System Flows

    a. Total Annual Average (over the last three years): 78,222 GPD

    b. Maximum Month (based on the last three years): 247,290 GPD

1. Project Planning

a. Location

The Hartstene Pointe community is a planned development that was originally constructed in the 1970's. It is located at the northeast end of Harstine Island in Puget Sound. The Hartstene Pointe Water/Sewer District (HPWSD) provides wastewater collection and treatment to the residential and commercial connections within the District.

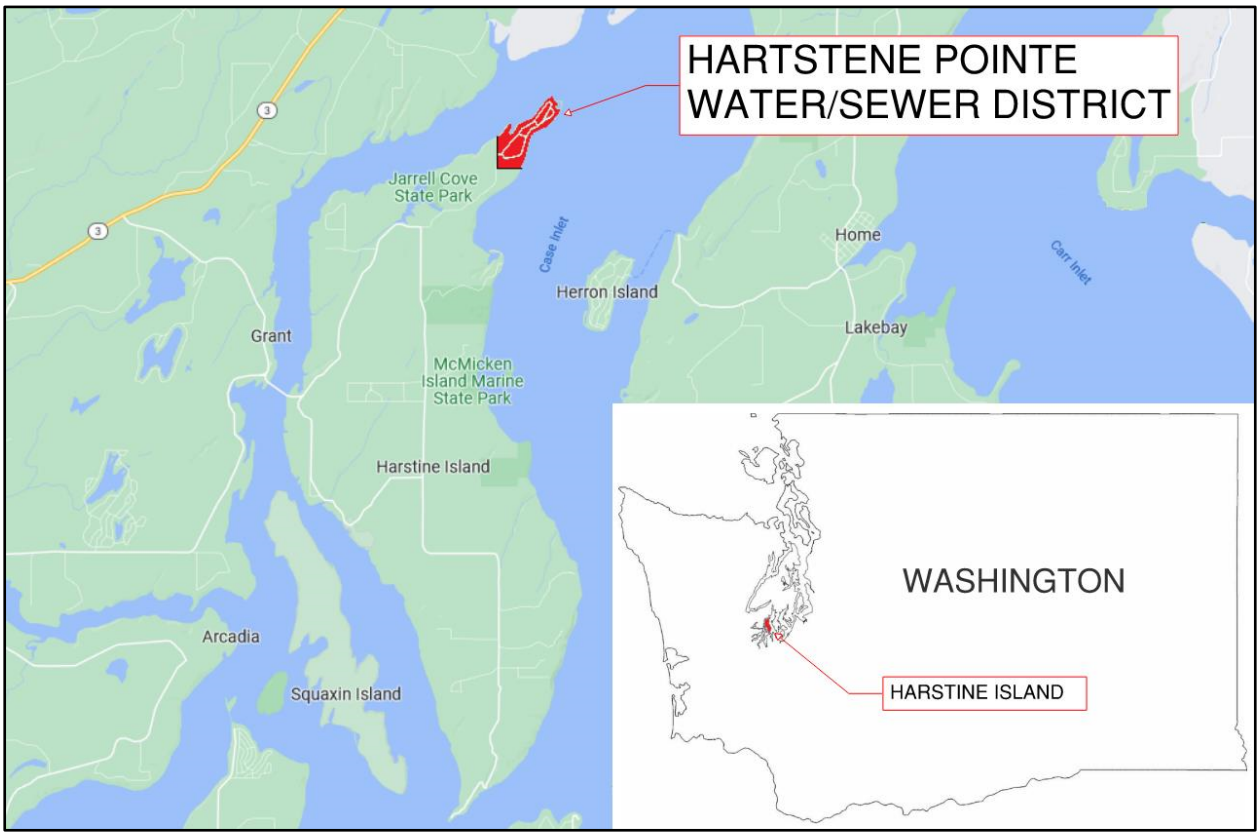


Figure 1-1. Vicinity Map

b. Environmental Resources Present

The District is within the gated Hartstene Pointe community. While individual lots are under private ownership, the lots are largely surrounded by community space owned by the Hartstene Pointe

Maintenance Association (HPMA). The HPMA is a separate entity from the HPWSD. While the HPWSD owns the water distribution and sewer collection and treatment facilities, the roads are owned and maintained by the HPMA. Utility easements were platted in the roadways.

The setting of the District is relatively rural, with some degree of open space between most residential lots. The open space is heavily forested with trees and natural vegetation. The community forms a peninsula surrounded on three sides by the waters of Puget Sound. The southwest edge of the community adjoins the larger Harstine Island.

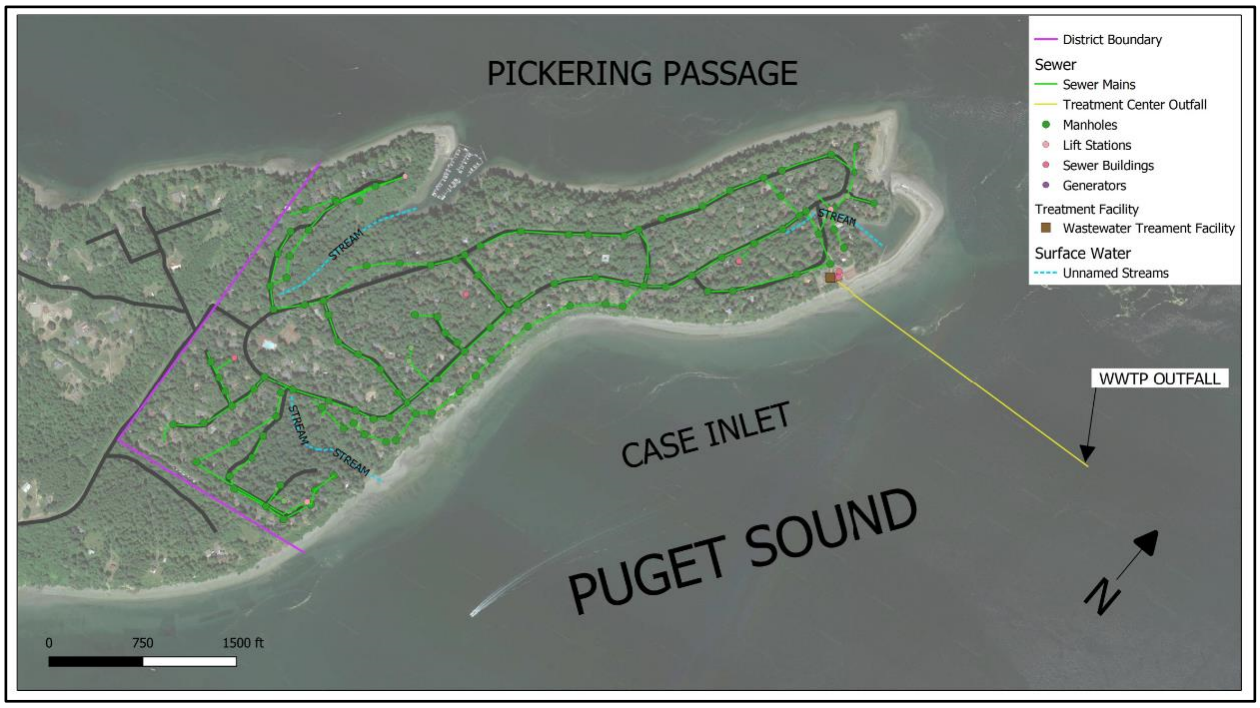


Figure 1-2. Environmental Resources/Surface Water Features

c. Population Trends

The District serves only the Hartstene Pointe community, which is a planned development. Of the 534 total lots, 445 have been built, making the system 83% built out. Infill of the remaining lots is expected to occur slowly over the 20-year planning period. No other additions to the system are anticipated.

d. Community Engagement

The District primarily engages the community through the HPMA. The board of the HPMA acts as a representative of the community members. The District also issues a monthly newsletter to district customers to keep the community aware of current events.

2. Existing Facilities

a. Location Map

Figure 2-1. Existing Sewer System

b. History

The sewer collection system was constructed with the original Hartstene Point development between 1970 and 1973. The collection system includes 25,070 feet of gravity sewers and force mains, 113 manholes, and three lift stations. The gravity collection system consists primarily of 4-foot sections of concrete pipe with rubberized gaskets.

The collection system has a longstanding problem with excessive Inflow and Infiltration (I&I). Previous efforts have been made to isolate and define problem areas. Select repairs to the sewer system were attempted in 1990 and 1995 with limited success. In 2008, the full sewer system was inspected by remote closed-circuit TV. The TV inspection was conducted in late April and early May 2008, when I&I would be visible, but would not cause full submergence of the camera. Approximately 25,000 linear feet of sewer mains were inspected. The inspection located a total 105 problem areas that were contributing to I&I, and concluded that side sewers were a significant source of I&I as well as the sewer mains.

c. Condition of Existing Facilities

I&I continues to be a significant issue. While dry season flows average under 45,000 gallons per day (GPD), wet season monthly averages often exceed the design maximum monthly flow of 186,000 GPD. During peak wet season, I&I account for up to 80% of all wastewater flows. This excessive I&I results in poor treatment performance, reduced efficiency, and operating permit violations.

Figure 2-2: Existing HPWSD Pipe

The short segment concrete pipe materials used in the original construction are very susceptible to widespread I&I. The frequent joints, brittle pipe, and 50-year old gaskets provide great opportunity for groundwater infiltration through misaligned joints, cracks in the pipe wall, and general

degradation over time. Much of the pipe was poorly installed, with skewed joints to make bends rather than proper elbows. Concrete pipe was used for both the main lines and the side sewers up to the property line. The service lines past the property lines are generally PVC, and much less likely to contribute to I&I.

In addition to the I&I concerns, one segment of the primary sewer main is facing a structural risk. The sewer main between Manhole 11 and Manhole 20 provides drainage to approximately half of the District's service area. The sewer main follows topography to provide gravity flow to the WWTP. The path of the sewer main runs along the edge of a bluff above Case Inlet in Puget Sound. Over the past five decades, natural erosion has pushed the edge of the bluff back further and further to the point that this segment of sewer main is facing the threat of failure due to landslide.

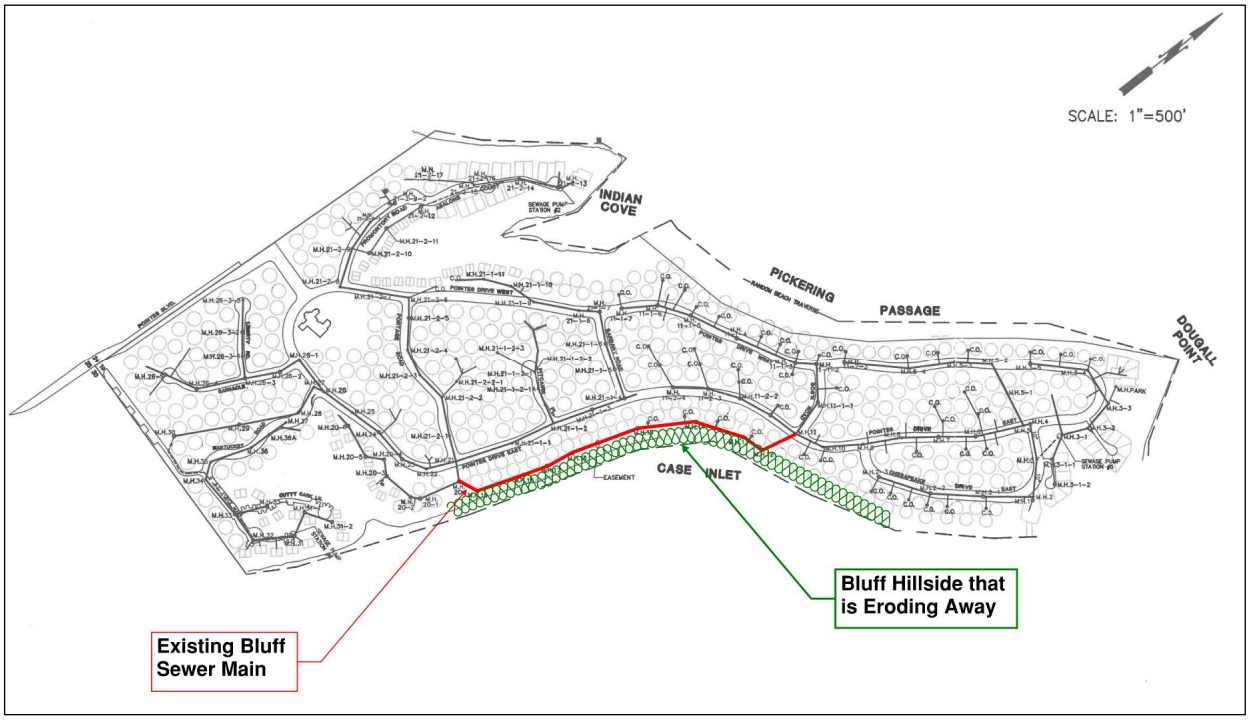


Figure 2-3: Existing Location of Bluff Sewer Main

d. Financial Status of Existing Facilities

The District operates both drinking water and wastewater utilities for it's customers. All residential connections are billed for both water and sewer services at a monthly rate of $80.63 for water and $86.97 for sewer, for a combined monthly total of $167.60. These rates are adequate to fund standard operations, maintenance, and debt service. However, the District does not have adequate reserves to self-fund a major capital improvement project.

The annual budget provides separate accounting of costs for water and sewer, but also includes combined cost items for some general operations categories. To determine the true cost-per-service for just the sewer utility, wastewater specific budget items were separated out from the general budget. For combined categories, the budget was split to attribute 52% of the cost to wastewater, commensurate with the split in monthly fees. The costs are summarized in the table below:

Table 2-1: Existing Cost per Service

Budget Category	Total Annual Cost	Monthly Cost per Connection
WW Operating Costs	$78,304	$14.66
Combined Operating Costs WW	$61,702	$11.55
WW Staff Costs	$211,251	$39.56
Capital Improvements	$51,955	$9.73
Debt Service	$38,111	$7.14
Reserves	$23,122	$4.33
Total	**$464,445**	**$86.97**

e. Flow Rates

For purposes of design and evaluation, flow rates must be considered under various conditions. Recorded flows are summarized below, based on the last three years:

- Average Daily (Annual Avg): 77,115 GPD
- Average Dry Weather Daily: 44,271 GPD

- Maximum Month: 247,290 GPD
- Calculated Maximum I&I: 247,290 GPD – 44,271 GPD = 203,019 GPD

Based on the recorded data, average flow rates can be derived for individual service connections, also referred to as an Equivalent Residential Unit (ERU). Flow rate per ERU should not include I&I when considered as individual connections, as most I&I occurs in the District owned mains and side sewers, not at the service connections.

- Average Daily (Dry Weather): 44,271 GPD/445 ERUs = 99.5 GPD/ERU (round to 100 GPD/ERU)
- Maximum Daily: Average Daily x 2.5 Peaking Factor = 250 GPD/ERU
- Peak Hour Flow = 100 GPD/ERU x 3.8 Peaking Factor / 1440 min/day = 0.264 GPM/ERU

Overall System Peak Flow will include both the Peak Hour Flow from connections as well as the Maximum Month I&I.

- System Peak Flow = (0.264 GPM/ERU x 445 ERUs) + (203,019 GPD / 1440 Min/Day) = 258 GPM

f. Wastewater Treatment Facilities

The District provides wastewater treatment through Sequencing Batch Reactors (SBRs) with activated sludge. Disinfection of the treated wastewater is by chlorine disinfection. Final discharge is to Case Inlet (Puget Sound) through a sub-marine discharge pipe with diffusers. The treatment plant is located at the far north-east edge of the District. The facility operates under NPDES Waste Discharge Permit No. WA0038377. The permit limits flows to a Maximum Monthly Design Flow of 186,000 Gallons Per Day (GPD), and a Peak Daily Design Flow of 342,000 GPD. The Maximum Month Influent Loading Limit for both BOD5 and TSS is 270 lbs/day. Permit limits on performance include 85% removal of influent BOD5 and TSS on a monthly average basis.

During normal, dry weather conditions, the facility operates easily within the permit limits, and has adequate capacity to serve existing and projected future connections. Unfortunately, high volumes of I&I during wet weather conditions have resulted in frequent violations of the hydraulic loading limits. The excess flows also reduce treatment efficiency, leading to discharge limit violations as well. Addressing I&I must be a priority for the District to improve treatment performance.

g. Water System

In addition to the sewer facilities, the District also owns and operates the public water system that supplies domestic water for all the connections within the district boundaries. The water facilities are described below, and shown on Figure 2-4.

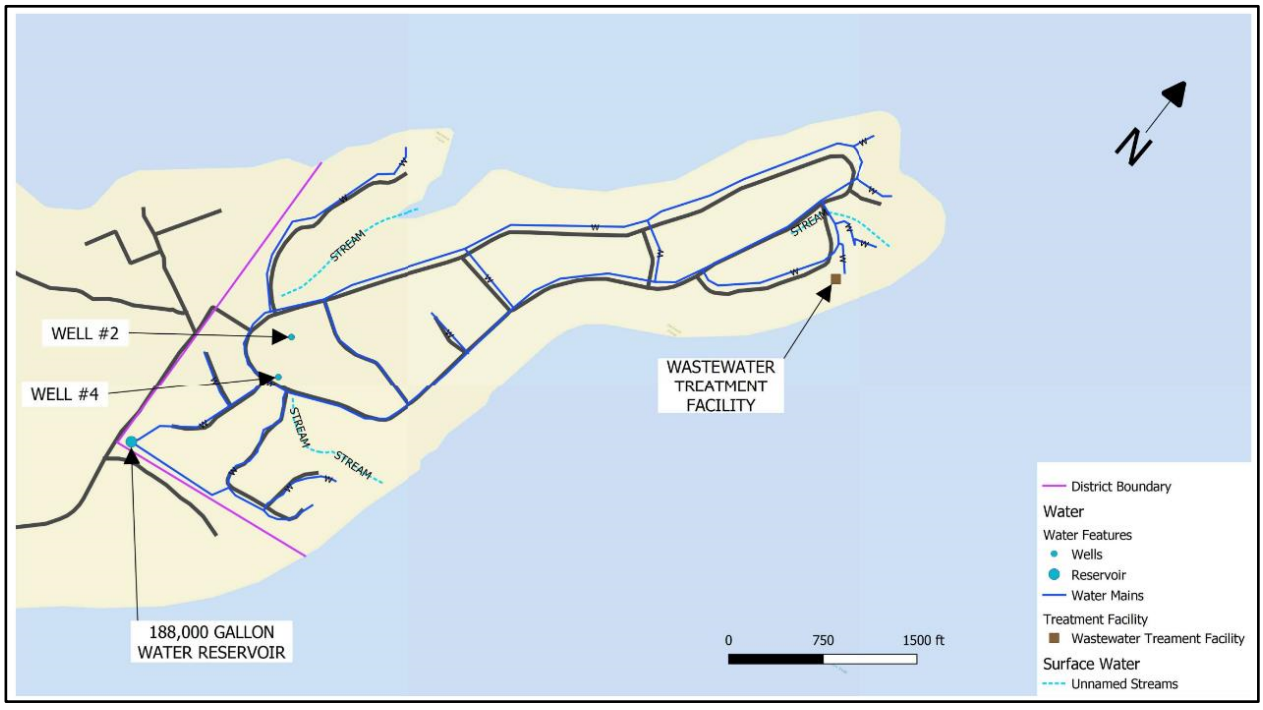


Figure 2-4: Water System Facilities

i. Water Sources

- Well #2 (WFI Source Number S02, Well Tag AHB690) was drilled in the 1974 and consists of an 8-inch diameter casing and screen with a total depth of 162 feet. The production capacity is

98 GPM. This well has iron and manganese levels that exceed the state Maximum Contaminant Level, and so is treated through a greensand filter and chlorination.

- Well #4 (WFI Source Number S04, Well Tag BIB339) was drilled in 2016 and consists of a 10-inch diameter casing and 8-inch diameter screen, with a total depth of 166.5 feet. The production capacity is 100 GPM. This well is not currently being treated.

There are two other wells on the system that are inactive. Well #1 dates from the 1960's and was previously a primary source, but is now inactive. Well #3 is undeveloped for use and remains inactive.

All of the wells are located in the south-west end of the district, near the Hartstene Point Community Center. There are no known private wells within the limits of the District, and no interties to other public water systems.

ii. Storage

The District has one reservoir for water storage. It is a 188,000-gallon welded steel standpipe that is located at the far south-west corner of the district. The reservoir has a total height of 79 feet, and is positioned at the highest point in the District to provide adequate pressure throughout the system.

iii. Distribution

The distribution system is made up of 2-, 4-, and 6-inch pipe, with 4-inch pipe making up the greatest percentage. Originally the pipes were the asbestos-cement type, but are being replaced with PVC pipe as repairs are made. The water lines primarily follow the roads and rights-of-way through the district, as do many of the sewer lines. Due to the age of construction, record drawings for these lines are minimal, and it is difficult to assess separation distances between existing water and sewer lines. As sewer line replacements occur, the separation distances will be field verified to ensure compliance with rule requirements.

3. Need for Project

a. Health, Sanitation, and Security

A catastrophic sewer failure due to a landslide is the greatest imminent threat to the health and security of the District. If erosion continues along the bluff, the sewer main will eventually fail as the soil around it slides away. Such a failure would release raw sewage into Puget Sound, threatening public health and aquatic resources.

b. Aging Infrastructure

The collection system has already shown excessive I&I for many years. Segmented concrete pipe with rubber gaskets is expected to have a design life of 50 – 100 years. The collection system is now over 60 years old, so joint failures and cracked pipes resulting in additional I&I are to be expected as the system continues to age. The concrete manholes throughout the system have a similar design life, and they will also allow more I&I to enter the system as the joints age and cracks form.

c. Reasonable Growth

As previously noted, the existing system is approximately 83% built out, and there is no expectation that the service area will expand. Existing facilities are adequately sized for the build-out condition, so no improvements to the system are needed to facilitate growth.

4. Alternatives Considered

SUBSECTION A: BLUFF SEWER RELOCATION

The existing sewer line segment along the Case Inlet bluff is located in soils that are progressively eroding away. It is reasonable to conclude that it is just a matter of time until the sewer line collapses as the soils that support it fall away.

There is no reasonable method to stabilize the hillside to prevent erosion caused by tide and wave action in Puget Sound. The sewer main segment must be relocated to circumvent the risk of failure. Alternatives for relocation may include gravity sewer, large lift stations, grouped grinder stations, or a combination of these, as detailed in the sections below:

4A.1 Gravity Sewer

a. Description

This alternative would abandon the existing sewer main along the bluff, and construct a new gravity sewer main at a new location to replace it. The new alignment would be within the existing easement in Pointes Drive East. An existing sewer main in Pointes Drive East would also be replaced as it currently flows to the south. The new sewer main will flow to the north from Manhole 20 to Manhole 11. Residences that are currently connected to the Bluff sewer main will be “turned around” so that they drain west towards the new sewer main rather than east. This alternative does not follow the natural topography, and so requires significant deep excavation to be feasible.

b. Design Criteria

The new gravity sewer main will convey drainage from a large area, approximately the southern half of the development. Although there is no direct measurement of the flow at this location, it is reasonable to assume that peak flow through this pipe will be half of the peak flow for the entire system.

With a calculated system peak flow of 258 GPM, the expected peak for the new sewer would be 129 GPM or 0.35 cubic feet per second (CFS). This flow rate is approximately 37% of the flow capacity for an 8-inch PVC sewer pipe laid at the minimum slope of 0.004 ft/ft. Therefore, the proposed design will use an 8-inch PVC pipe at minimum slope.

c. Map

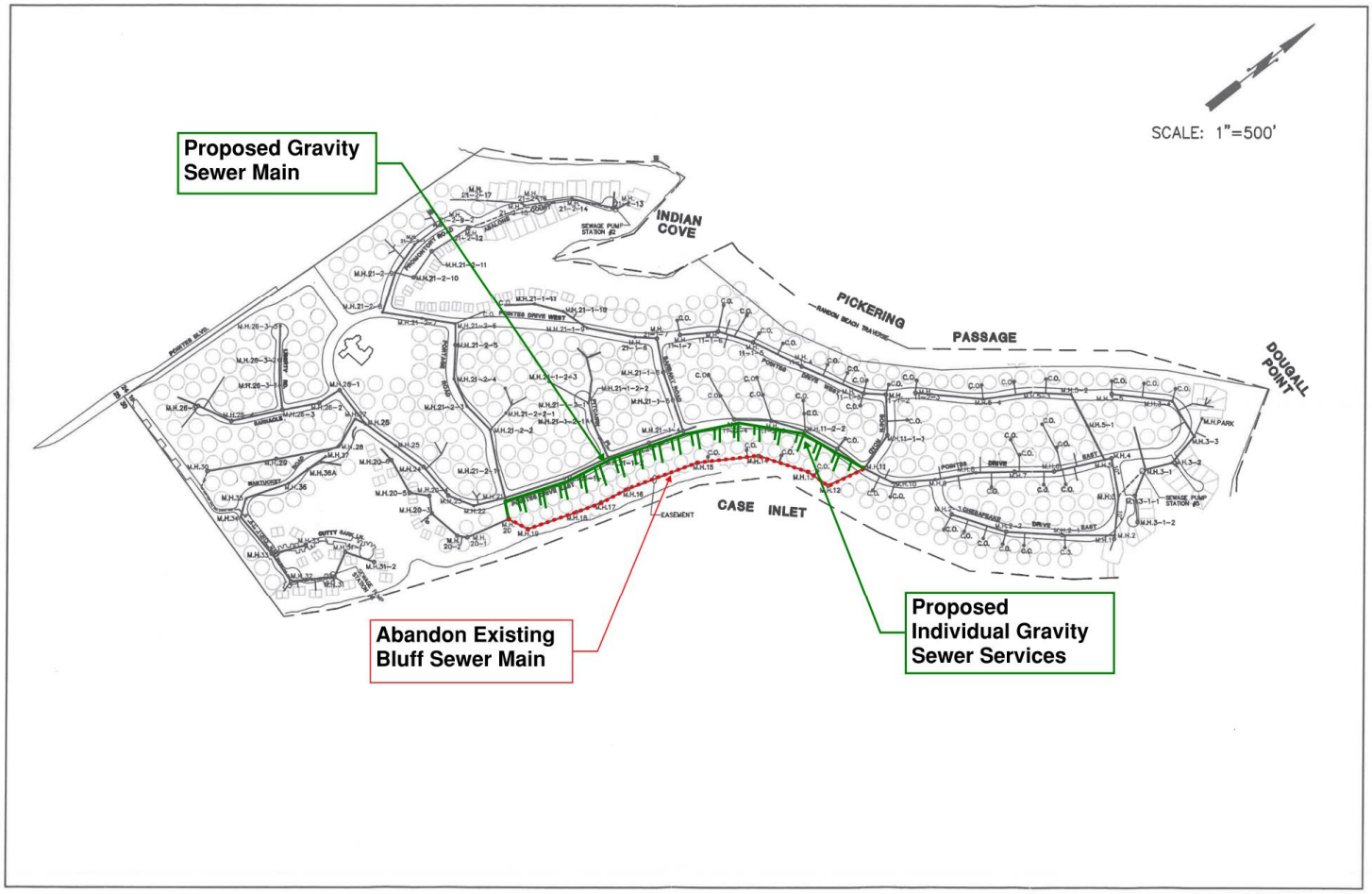


Figure 4-1: Alternative 1 Gravity Sewer

d. Environmental Impacts

The deep excavation required for this alternative will move much more soil, and disturb a larger area than other alternatives. Groundwater is likely to be encountered in the trench, so the de-watering operation will likely require settling basins and discharge of water over a large land area. Special provisions will be required to prevent erosion and damage from the water discharge.

Another concern, particularly when replacing service lines, is loss of trees. Service lines will require trenches to be excavated between houses. Much of the space between houses is heavily treed. The trench path will need to be cleared of trees to allow excavation to take place. Due to the depths required, some trees that are beyond the immediate trench path may be undermined and lost.

e. Land Requirements

The new sewer main will be placed within the existing public utility easement in Pointes Drive East, so no additional land will be needed for the main line. The service connections from each residence will also need to be redirected towards the new main. It is anticipated that most connections will be located within the public space between lots. However, the new path of each service connection, and the related land needs will need to be evaluated on a case-by-case basis.

f. Potential Construction Problems

The proposed main runs counter to the topography in that as the pipe is sloped downward, the topography is sloped upward. The result is that the sewer main requires much deeper excavation than is typical for a residential sewer main. As the proposed sewer main runs north along Pointes Drive East, from Portage Road to Barbary Road, the pipe depth will increase from 9 feet to 30 feet. Excavation at this depth requires specialty excavation equipment and extensive shoring for the trench wall. The presence of groundwater at this depth is likely, requiring additional effort for dewatering, and stabilizing saturated soils.

Excavation at this depth would require geotechnical analysis during the design phase. A series of soil borings would be completed along the route to detect the presence of solid rock in the construction zone. The analysis would also provide information for trench shoring and ground water presence.

The exact elevation and location of each service connection is unknown, and the distance to the new sewer main will be considerably longer than the distance to the existing main. Some of the service connections may not be able to achieve gravity flow to the new main. As with the main line itself, the pipe slope is counter to topography, so excavation for installation of gravity sewer services will be much deeper than typical, and will disturb large areas.

g. Sustainability Considerations

The construction process for a gravity main and gravity service lines will be more intensive than other alternatives as deep excavation, trench shoring, and dewatering are expected. However, once installed, this alternative will have the lowest energy requirements with no electrical power needed for operation.

h. Cost Estimates

Bluff Line Replacement
Alternative 1: All Gravity Sewer Main and Services
PLANNING LEVEL COST ESTIMATE

	DESCRIPTION OF ITEM	EST. QTY.	UNITS	UNIT PRICE	AMOUNT
1	Mobilization	1	LS	$164,000.00	$164,000.00
2	Clearing and Grubbing	2	AC	$25,000.00	$50,000.00
3	Trench Excavation & Backfill, 0-10 Ft Depth	480	LF	$45.00	$21,600.00
4	Trench Excavation & Backfill, 10-20 Ft Depth	1,030	LF	$105.00	$108,150.00
5	Trench Excavation & Backfill, 20-30 Ft Depth	900	LF	$180.00	$162,000.00
6	Specialty Shoring	1,930	LF	$40.00	$77,200.00
7	Pipe Bedding	2,410	LF	$12.00	$28,920.00
8	8-Inch PVC Sewer Main, D 3034, SDR 35	2,410	LF	$48.00	$115,680.00
9	Concrete Manhole, 48-Inch Diameter, 10' depth	10	EA	$6,800.00	$68,000.00
10	Concrete Manhole, 48-Inch, Additional Depth	60	VF	$250.00	$15,000.00

11	Service Line Trench Excavation & Backfill, 0-10 Ft Depth	2,140	LF	$35.00	$74,900.00
12	Service Line Trench Excavation & Backfill, 10-20 Ft Depth	1,100	LF	$60.00	$66,000.00
13	Service Line Trench Excavation & Backfill, 20-30 Ft Depth	900	LF	$80.00	$72,000.00
14	Service Line Bedding	4,140	LF	$4.00	$16,560.00
15	4-Inch PVC Sewer Service Pipe	4,140	LF	$6.00	$24,840.00
16	Asphalt Repair, 3-Inch Depth, 22-Foot width	5,900	SY	$45.00	$265,500.00
17	Crushed Surfacing Top Course, 4-Inch Depth	655	CY	$105.00	$68,775.00
18	Surface Restoration, Hydroseed	2	AC	$11,000.00	$22,000.00
19	Slope Protection Blanket	400	SY	$10.00	$4,000.00
20	Traffic Control	40	DAY	$1,500.00	$60,000.00
21	Trench Dewatering	75	DAY	$3,000.00	$225,000.00
22	Temporary Sewage Bypass Pumping	25	DAY	$2,500.00	$62,500.00
23	Spill Prevention, Control, and Countermeasures	1	LS	$20,000.00	$20,000.00
24	Existing Sewer Line Abandonment (Grout Fill)	2,200	LF	$5.00	$11,000.00
					$0.00
				CONSTRUCTION TOTAL	**$1,803,625.00**
				CONSTRUCTION CONTINGENCY, 25%	**$451,000.00**
				SALES TAX 8.5%	**$191,643.13**
				ENGINEERING DESIGN	**$293,200.00**
				CONSTRUCTION MANAGEMENT & INSPECTION	**$270,600.00**
				TOTAL ESTIMATED CAPITAL COST	**$3,011,000.00**

i. O&M Costs

Gravity sewer mains have very low operation & maintenance (O&M) costs. No electrical power is needed for water to flow downhill, and there are no mechanical parts to maintain. It is assumed a nominal amount of time will be spent inspecting and maintaining the lines, totaling 40 man-hours, or $1,000.00 per year.

4A.2 Community Lift Station with Grouped Grinder Pumps

a. Description

This alternative would abandon the existing gravity sewer main along the bluff, and would replace it with a new Community Lift Station at Manhole 20, near the intersection of Pointes Drive East and Portage Road. The new lift station would collect from all services to the west and south of the intersection, and would pump to Manhole 11-2-4, which is on Pointes Drive East, just north of Barbary Road. Small grinder pump lift stations would be installed for the service connections that currently drain into the bluff sewer main. These grinder lift stations would be placed so that between one and four residences would drain into each grinder station. There are 35 lots that would need to be served by grinder pump stations, although not all of the lots are occupied or built upon. For evaluation purposes, it is assumed that 12 grinder stations will be required to serve these lots, with an average of 3 lots per grinder station. These stations would pump to the existing gravity main in Pointes Drive East.

b. Design Criteria

The community lift station would be sized to provide service for the approximately 353 existing and future services that would drain to it. The pumps would also need to handle the peak I&I coming from that drainage area. The lift station must be equipped with two pumps for redundancy. Each pump is sized to discharge the peak hour residential flow of 93.2 GPM plus I&I loading of 93 GPM, for a total inflow of 186.2 GPM. The pumps will be sized to discharge 200 GPM to ensure adequate capacity. The pumps will operate in an alternating lead-lag configuration, so that the lead pump will alternate at each pump cycle. Only the lead pump will run during a normal cycle. In the event of a lead pump failure, or unusually high flow rate, the lag pump will also turn on until the pump cycle is complete. The wet well is sized to provide minimum submergence, working volume, and storage volume.

i) Minimum submergence is the volume required to keep submersible pumps submerged. This is necessary to provide adequate cooling of the motors and ensure long performance life. A minimum water level is also needed to prevent a surface vortex from forming, as that could negatively effect pump performance. A water depth that meets minimum submergence is more than adequate to prevent vortex formation. The pumps have a height of approximately three (3) feet, which will be the minimum submergence depth. For a wet well with a standard 8-foot diameter, the minimum submergence volume is 1,127 gallons.

ii) Working Volume is the volume between the ON switch and Off switch for pump operation. The minimum working volume can be calculated from the formula in section C2-1.2.5 of Ecology's Criteria for Sewage Works Design (CSWD): V=tQ/4, where t is the minimum time between pump starts and Q is the pump capacity in GPM. To limit pump cycling to a maximum of 4 starts per hour, t=15 minutes, and Q=200 GPM as previously stated. The Working Volume is then V=(15 Min)(200 GPM)/4= 750 gallons. For an 8-foot diameter wet well, this volume requires a depth of 2.0 feet.

iii) Storage Volume is the volume required to store 24 hours of flow in the event of a power outage. Due to the high flows entering this lift station, 24 hours of storage would exceed 170,000 gallons, making on-site emergency storage impossible. Instead, an on-site standby generator will be required, so that the lift station will continue operating during a power outage. The wet well should include a small amount of Storage Volume to allow the generator several minutes to start up and make the transition to standby power. Five minutes worth of storage at the peak hour flow of 190 GPM requires a volume of 950 gallons, equivalent to a depth of 2.53 feet.

iv) The dimensions of the lift station are also dependent on the depth of the gravity sewer main that drains into the wet well. If placed adjacent to MH 20, the sewer is approximately 7.5 feet

below the ground surface. The depth for gravity sewer invert, plus depths for minimum coverage, operational volume, and storage volume result in a minimum depth of 15.03 feet. (7.5 + 3 + 2 + 2.53 = 15.03). For flexibility in design, and to allow freeboard above the ground surface, the wet well will be sized for a 16 foot depth, which is a standard dimension.

The grouped grinder pump stations would be sized based on the number of connections served. The Peak Design Flow is taken from CSWD section C1-10.1.2, with the equation is Q=15+(.5)D, where Q is the peak flow in GPM, and D is the number of dwellings served. For grinder pumps that serve one, two, three or four connections, the peak design flows are 15.5 GPM, 16.0 GPM, 16.5 GPM, and 17 GPM, respectively. The required volume of the grinder pump station is the sum of the Detention Volume, Working Volume, and Storage Volume.

i) The Detention Volume is calculated as V_d=1.5Q, where V_d is the volume in gallons and Q is the peak day flow for the connection(s) served. For three residential connections, V_d =1.5(250 GPD)(3) which is 1,125 Gallons.

ii) Working Volume is the volume between the ON switch and Off switch for pump operation. To limit pump cycling to a maximum of 4 starts per hour, the Working Volume must be a minimum of 62 gallons, where V=(15 Min)(16.5 GPM)/4= 62 gallons.

iii) Storage Volume is the volume required to store 24 hours of flow in the event of a power outage. This volume is based on average daily flow per ERU, V_s=(No of ERUs)(ADF/ERU). For three ERUs with an average flow rate of 100 GPD, V_s=(3)(100 GPD/ERU) for a total Storage Volume requirement of 300 Gallons.

iv) The sum of the Detention Volume, Working Volume, and Storage Volume for a grinder station serving three residences is 1,125 Gal + 62 Gal + 300 Gal = 1,487 Gallons. For constructability, the volume will be rounded to 1,500 Gallons, which is a common size for manufactured septic vessels.

Table 4-1: Grinder Station Volume Requirements

Storage Type	1 Connection	2 Connections	3 Connections	4 Connections
Detention Volume	375	750	1,125	1,500
Working Volume	58	60	62	64
Storage Volume	100	200	300	400
Total Volume (Gallons)	533	1,010	1,487	1,964

c. Map

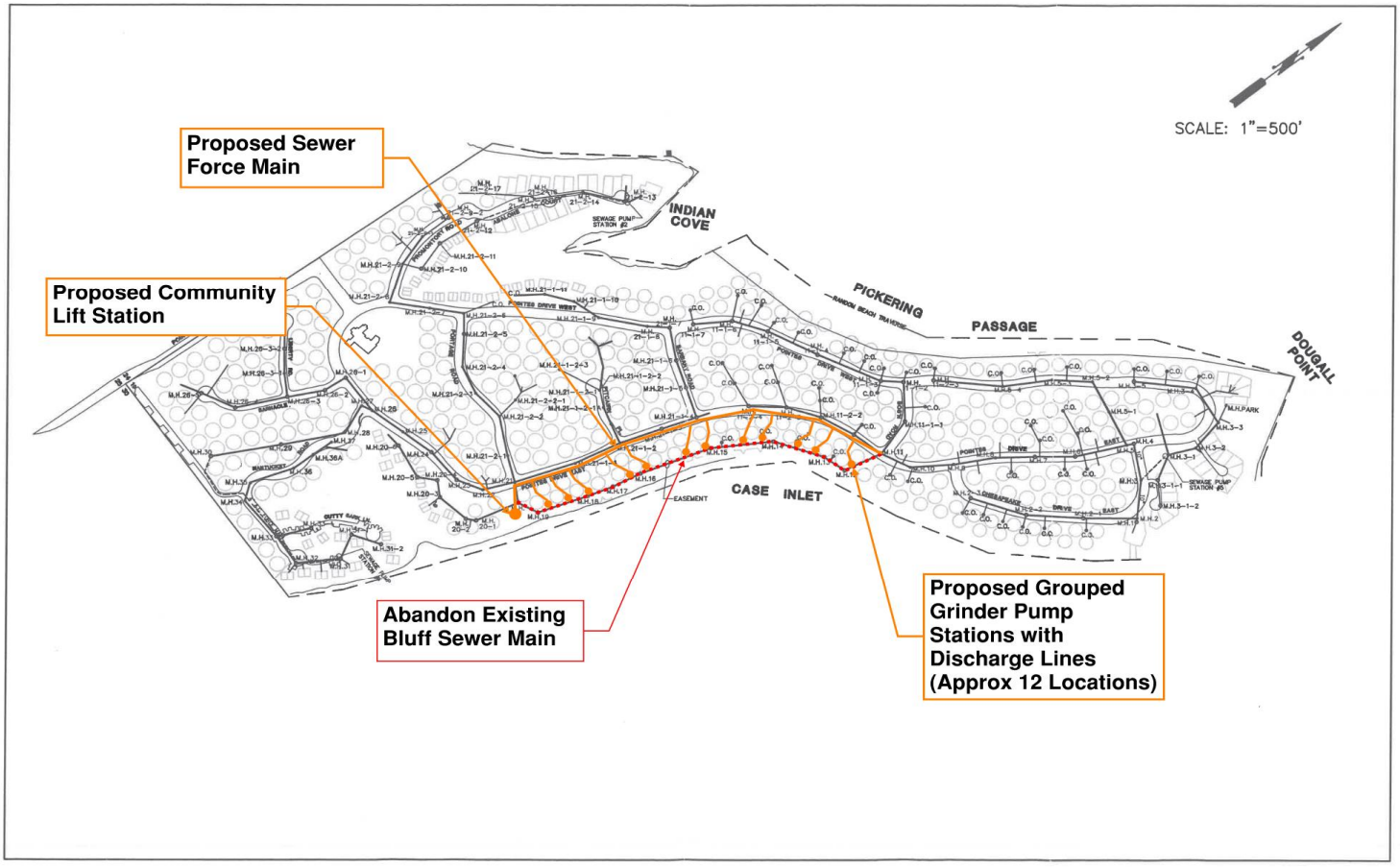


Figure 4-2: Community Lift Station with Grouped Grinder Pumps

d. Environmental Impacts

The community lift station and force main will be located along an existing roadway. Excavation for the lift station will be confined to the immediate site. Excavation for the force main will be relatively shallow at approximately 4 feet deep. No significant environmental impacts are expected.

Installation of the grinder pump stations will require excavation for the station itself, as well as the gravity lines draining to the station and the pressure lines going to Pointes Drive East. Excavation for the pressure lines will be much shallower than gravity lines, as they can follow the ground topography. This will require less ground disturbance, and fewer trees affected than a gravity sewer alternative.

e. Land Requirements

The community lift station would be located adjacent to Manhole 20 in the existing right-of-way. The force main would follow along Pointes Drive East to the discharge location at Manhole 11-2-4. All of the community lift station components would be within existing right-of-way, so no new land acquisition would be required.

The grinder pump stations will be located in the common area between residential lots. The pressure lines from the grinder stations will also run in the common area between lots.

f. Potential Construction Problems

Due to topography, vegetation, and existing structures, finding a suitable location for multiple grinder pump stations may be difficult. The particular location of each grinder pump will have to be determined in the field to accommodate field conditions and the service lines from each residence.

Bringing electrical power in for each grinder pump station will require multiple new electrical service drops and meters.

g. Sustainability Considerations

This alternative includes both a community lift station and multiple grinder pump stations. All of these pumps utilize electrical power to convey wastewater, so there is a higher energy use than a gravity only system.

h. Cost Estimates

Bluff Line Replacement

Alternative 2: Community Lift Station and Grouped Grinder Pumps

PLANNING LEVEL COST ESTIMATE

	DESCRIPTION OF ITEM	EST. QTY.	UNITS	UNIT PRICE	AMOUNT
1	Mobilization	1	LS	$103,000.00	$103,000.00
2	Clearing and Grubbing	1	AC	$25,000.00	$25,000.00
3	Trench Excavation & Backfill, 4 Ft Depth	1,660	LF	$30.00	$49,800.00
4	Pipe Bedding	1,660	LF	$10.00	$16,600.00
5	6-Inch HDPE Pressure Sewer	1,660	LF	$35.00	$58,100.00
6	Wastewater Lift Station, Duplex 7.5 Hp Pumps	1	EA	$200,000.00	$200,000.00
7	Standby Power Generator, 30kW	1	EA	$45,000.00	$45,000.00
8	Pressure Sewer Cleanout	3	EA	$3,500.00	$10,500.00
9	Service Line Trench Excavation & Backfill, 4 Ft Depth	2,400	LF	$15.00	$36,000.00
10	2-Inch HDPE Pressure Sewer	2,400	LF	$10.00	$24,000.00
11	Grinder Pump Station, Duplex Pumps	12	EA	$25,000.00	$300,000.00
12	Asphalt Repair, 3-Inch Depth, 10-Foot width	2,700	SY	$45.00	$121,500.00
13	Crushed Surfacing Top Course, 4-Inch Depth	300	CY	$105.00	$31,500.00
14	Surface Restoration, Hydroseed	1	AC	$11,000.00	$11,000.00
15	Slope Protection Blanket	200	SY	$10.00	$2,000.00
16	Traffic Control	20	DAY	$1,500.00	$30,000.00
17	Trench Dewatering	0	DAY	$3,000.00	$0.00
18	Temporary Sewage Bypass Pumping	0	DAY	$2,500.00	$0.00
19	Spill Prevention, Control, and Countermeasures	1	LS	$20,000.00	$20,000.00
20	Existing Sewer Line Abandonment (Grout Fill)	2,200	LF	$5.00	$11,000.00
					$0.00
				CONSTRUCTION TOTAL	**$1,095,000.00**
				CONSTRUCTION CONTINGENCY, 25%	**$273,800.00**
				SALES TAX 8.5%	**$116,348.00**
				ENGINEERING DESIGN	**$246,400.00**
				CONSTRUCTION MANAGEMENT & INSPECTION	**$164,300.00**
				TOTAL ESTIMATED CAPITAL COST	**$1,896,000.00**

i. O&M Costs

This alternative uses a lift station and multiple grinder pumps that have an electrical operating cost. Each of these components also require occasional inspection and maintenance, as well as periodic replacement. The anticipated annual expenses are detailed below.

ANNUAL O&M COST ESTIMATE

	DESCRIPTION OF ITEM	QTY.	UNITS	PRICE	AMOUNT
1	Operator Labor, (Lift Station Monthly Inspection)	12	ManHr	$25.00	$300.00
2	Pump Electrical Cost, 11.2 kW, 5 hrs/day, 12 mo.	20,160	kW-Hr	$0.074	$1,491.84
3	Pump Replacement, 1 Pump every 5 Years	0.2	EA	$6,500.00	$1,300.00
4	Standby Power Generator Maintenance	12	Month	$100.00	$1,200.00
5	Operator Labor, (Grinder Pump Monthly Inspection)	144	ManHr	$25.00	$3,600.00
6	Grinder Pump Elect Cost, 2.3 kW, 2 hrs/day, 12 mo, x12	20,000	kW-Hr	$0.074	$1,480.00
7	Grinder Pump Replacement, 1 Pump every Year	1.0	EA	$2,500.00	$2,500.00
				ANNUAL O&M TOTAL	**$11,900.00**

4A.3 Gravity Sewer Main with Grouped Grinder Pumps

a. Description

This alternative combines components of two previous alternatives. In this alternative, the gravity sewer main along the bluff will be abandoned with a new gravity sewer main constructed in Pointes Drive East. The new sewer main will flow to the north from Manhole 20 to Manhole 11, and would include replacing the existing main in Pointes Drive East.

The individual services that currently drain to the bluff sewer main, would be redirected to drain to grinder pump stations that would serve an average of three lots each. The grinder pumps would discharge to the gravity main in Pointes Drive East.

b. Design Criteria

The gravity sewer main is sized to serve approximately 353 existing and future services that would drain to it, as well as peak I&I, for a design flow rate of 186 GPM, or 0.498 CFS. This is well within the capacity of an 8-inch PVC sewer pipe laid at the minimum slope of 0.004 ft/ft. Therefore, the proposed design will use an 8-inch PVC pipe at minimum slope.

The grinder pumps will be sized based on the number of connections each one serves. Each is expected to serve between one and four connections. The volume is based on the sum of the Detention Volume, Working Volume, and Storage Volume, as detailed above. For evaluation purposes, it is assumed that 12 grinder stations will be required to serve these lots, with an average of 3 lots per grinder station. This would require a 1,500 gallon grinder station with a 16.5 GPM pump.

This alternative differs from Alternative 1 by using grouped grinder stations instead of laying new gravity service connections. This significantly reduces the deep excavation in the common area between houses, and all the surface disturbance, tree loss, and environmental impacts that goes along with deep excavation.

c. Map

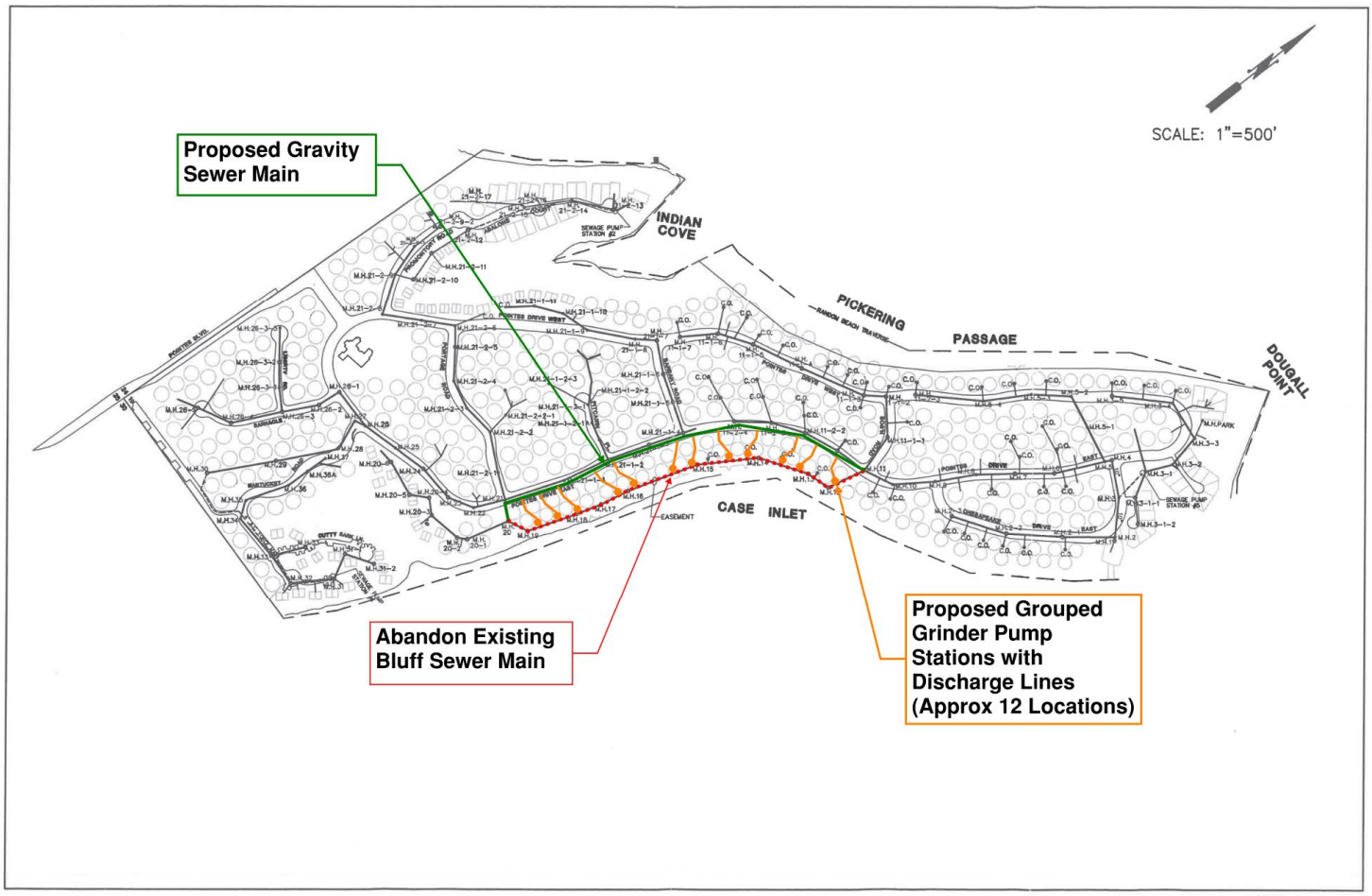


Figure 4-3: Alternative 3 Gravity Sewer with Grouped Grinder Pumps

d. Environmental Impacts

The deep excavation required for the gravity sewer main will move much more soil, and disturb a larger area than the community lift station alternative. Groundwater is likely to be encountered in the trench, so the de-watering operation will likely require settling basins and discharge of water over a large land area. Special provisions will be required to prevent erosion and damage from the water discharge.

Excavation for the grinder stations and discharge piping is relatively shallow as compared to gravity drain lines, and so the grouped grinder stations will have minimal environmental impact.

e. Land Requirements

The new sewer main will be placed within the existing public utility easement in Pointes Drive East, so no additional land will be needed for the main line. The grinder pump stations will be located in the common area between residential lots. The pressure lines from the grinder stations will also run in the common area between lots. So no new land acquisition would be required.

f. Potential Construction Problems

The proposed main runs counter to the topography in that as the pipe is sloped downward, the topography is sloped upward. So the sewer main will have deep excavation increasing from 9 feet to 30 feet. Excavation at this depth requires specialty excavation equipment and extensive shoring for the trench wall. The presence of groundwater at this depth is likely, requiring additional effort for dewatering, and stabilizing saturated soils.

Finding a suitable location for each of 12 grinder pump stations may be difficult. The particular location of each grinder pump will have to be determined in the field to accommodate local conditions and the service lines from each residence. Each site will also require electrical service drops and meters.

g. Sustainability Considerations

A gravity sewer main is the most efficient way to convey wastewater, as no electrical power is required. The grinder pumps serving groups of residences will require power, and so are less efficient than an all-gravity system.

h. Cost Estimates

Bluff Line Replacement

Alternative 3: Gravity Sewer Main with Grinder Pump Stations

PLANNING LEVEL COST ESTIMATE

	DESCRIPTION OF ITEM	EST. QTY.	UNITS	UNIT PRICE	AMOUNT
1	Mobilization	1	LS	$162,000.00	$162,000.00
2	Clearing and Grubbing	2	AC	$25,000.00	$50,000.00
3	Trench Excavation & Backfill, 0-10 Ft Depth	480	LF	$45.00	$21,600.00
4	Trench Excavation & Backfill, 10-20 Ft Depth	1,030	LF	$105.00	$108,150.00
5	Trench Excavation & Backfill, 20-30 Ft Depth	900	LF	$180.00	$162,000.00
6	Specialty Shoring	1,930	LF	$40.00	$77,200.00
7	Pipe Bedding	2,410	LF	$12.00	$28,920.00
8	8-Inch PVC Sewer Main, D 3034, SDR 35	2,410	LF	$48.00	$115,680.00
9	Concrete Manhole, 48-Inch Diameter, 10' depth	10	EA	$6,800.00	$68,000.00
10	Concrete Manhole, 48-Inch, Additional Depth	60	VF	$250.00	$15,000.00
11	Service Line Trench Excavation & Backfill, 4 Ft Depth	2,400	LF	$25.00	$60,000.00
12	2-Inch HDPE Pressure Sewer	2,400	LF	$10.00	$24,000.00
13	Grinder Pump Station, Duplex Pumps	12	EA	$25,000.00	$300,000.00
16	Asphalt Repair, 3-Inch Depth, 22-Foot width	5,900	SY	$45.00	$265,500.00
17	Crushed Surfacing Top Course, 4-Inch Depth	655	CY	$105.00	$68,775.00
18	Surface Restoration, Hydroseed	2	AC	$11,000.00	$22,000.00
19	Slope Protection Blanket	400	SY	$10.00	$4,000.00
20	Traffic Control	40	DAY	$1,500.00	$60,000.00
21	Trench Dewatering	25	DAY	$3,000.00	$75,000.00
22	Temporary Sewage Bypass Pumping	25	DAY	$2,500.00	$62,500.00
23	Spill Prevention, Control, and Countermeasures	1	LS	$20,000.00	$20,000.00
24	Existing Sewer Line Abandonment (Grout Fill)	2,200	LF	$5.00	$11,000.00
					$0.00
				CONSTRUCTION TOTAL	**$1,781,325.00**
				CONSTRUCTION CONTINGENCY, 25%	**$445,400.00**
				SALES TAX 8.5%	**$189,271.63**
				ENGINEERING DESIGN	**$289,500.00**
				CONSTRUCTION MANAGEMENT & INSPECTION	**$267,300.00**
				TOTAL ESTIMATED CAPITAL COST	**$2,973,000.00**

i. O&M Costs

This alternative uses a gravity sewer main line, but also uses multiple grinder pumps for the service connections, which have an electrical operating cost. The gravity sewer main has minimal O&M requirements, while the grinder pumps have components that require occasional inspection and maintenance, as well as periodic replacement. The anticipated annual expenses are detailed below.

ANNUAL O&M COST ESTIMATE

	DESCRIPTION OF ITEM	QTY.	UNITS	PRICE	AMOUNT
1	Operator Labor, (Gravity Sewer Bi-Annual Inspection)	40	ManHr	$25.00	$1,000.00
2	Operator Labor, (Grinder Pump Monthly Inspection)	144	ManHr	$25.00	$3,600.00
3	Grinder Pump Elect Cost, 2.3 kW, 2 hrs/day, 12 mo, x12	20,000	kW-Hr	$0.074	$1,480.00
4	Grinder Pump Replacement, 1 Pump every Year	1.0	EA	$2,500.00	$2,500.00
				ANNUAL O&M TOTAL	**$8,600.00**

SUBSECTION B: EXCESS I&I

Excessive I&I is causing problems with treatment capacity and effectiveness, as described and documented above. Addressing the issue requires widespread repair of the collection piping, including both the mains and District-owned side sewers. There are four potential methods to achieve this. These methods are investigated and analyzed in the following sections based on feasibility, outcome, and capital cost.

4B.1 Alternative 1 – No Action

a. Description

The first alternative considered is a no action option. The feasibility of this option is straight forward and simple as it would require no effort or cost on the part of the District in the short term. Future failures

and discovered leaks of the sewer pipe could be addressed by point repairs. The known problem areas already exceed the financial and workforce capacity of District staff to keep up with repairs. The frequency and size of pipe failures and leaks will increase as the system continues to age and degrade.

b. Design Criteria

None.

c. Map

None.

d. Environmental Impacts

Excessive I&I results in poor treatment performance, which has been an ongoing problem with the District. Poor treatment directly affects the environmental health of Puget Sound, and nearby beneficial uses. Additionally, leaks and failures of sewer mains could lead to a direct discharge of raw sewage to Puget Sound, which would require an Emergency Spill Response by the Department of Ecology. As it is, the District incurs permit violations on a regular basis due to excess I&I.

e. Land Requirements

None.

f. Potential Construction Problems

While the No Action alternative doesn't have planned construction activities, emergency repairs will be needed on an increased basis. Main breaks could or would likely occur at unanticipated time frames and in locations that may not be identified until a sink hole developed in a roadway or shoulder surface. By that time the need to execute a repair would be imminent, costly, and difficult.

g. Sustainability Considerations

Performing No Action will allow the excessive I&I to continue, and likely increase as the pipes and joints continue to deteriorate. As a result, excessive cost and energy is required to treat the additional flow, and the treatment of wastewater is less effective.

h. Cost Estimates

While this alternative has the lowest cost and least effort in the short-term, it does nothing to correct the detrimental effects of I&I. As noted above, point repairs when they occur would require immediate attention which, if self-performed, would be difficult to achieve and if performed by a contractor would be done under high cost no bid scenarios leading to overtime, high materials, and excessive equipment costs. The long term costs of treating excessive flows, as well as continued and increasing costs of point repairs will eventually outweigh the short-term savings. Repeated permit violations may also result in fines from Ecology that can quickly exceed the cost of repairs.

No cost estimate can adequately be prepared for this option as the exact timing, cost, and required scope of repairs cannot be reasonably estimated.

4B.2 Alternative 2 – Open Trench

a. Description

The most conventional method of addressing the excessive I&I situation would be to replace the existing gravity sewer mains, manholes, and side sewers with new PVC pipe and manholes with gasketed joints. Along the identified segments, the existing sewer mains will be dug up using standard open-trench construction methods. New PVC pipe will be laid alongside the old pipe, along with new manholes. Side sewers (service connections) will be replaced up to the property line of the residence. Open trench replacement would leave the District with a long lasting sewer main and would provide a highly resilient solution but is a much more invasive approach compared to other alternatives.

b. Design Criteria

This alternative replaces existing concrete gravity sewer pipe with ASTM D3034 PVC pipe. Manholes will be replaced with precast concrete units that use watertight gaskets to prevent groundwater entry. The size and slope of pipes will match the exiting pipes, and will have the same capacity.

c. Map

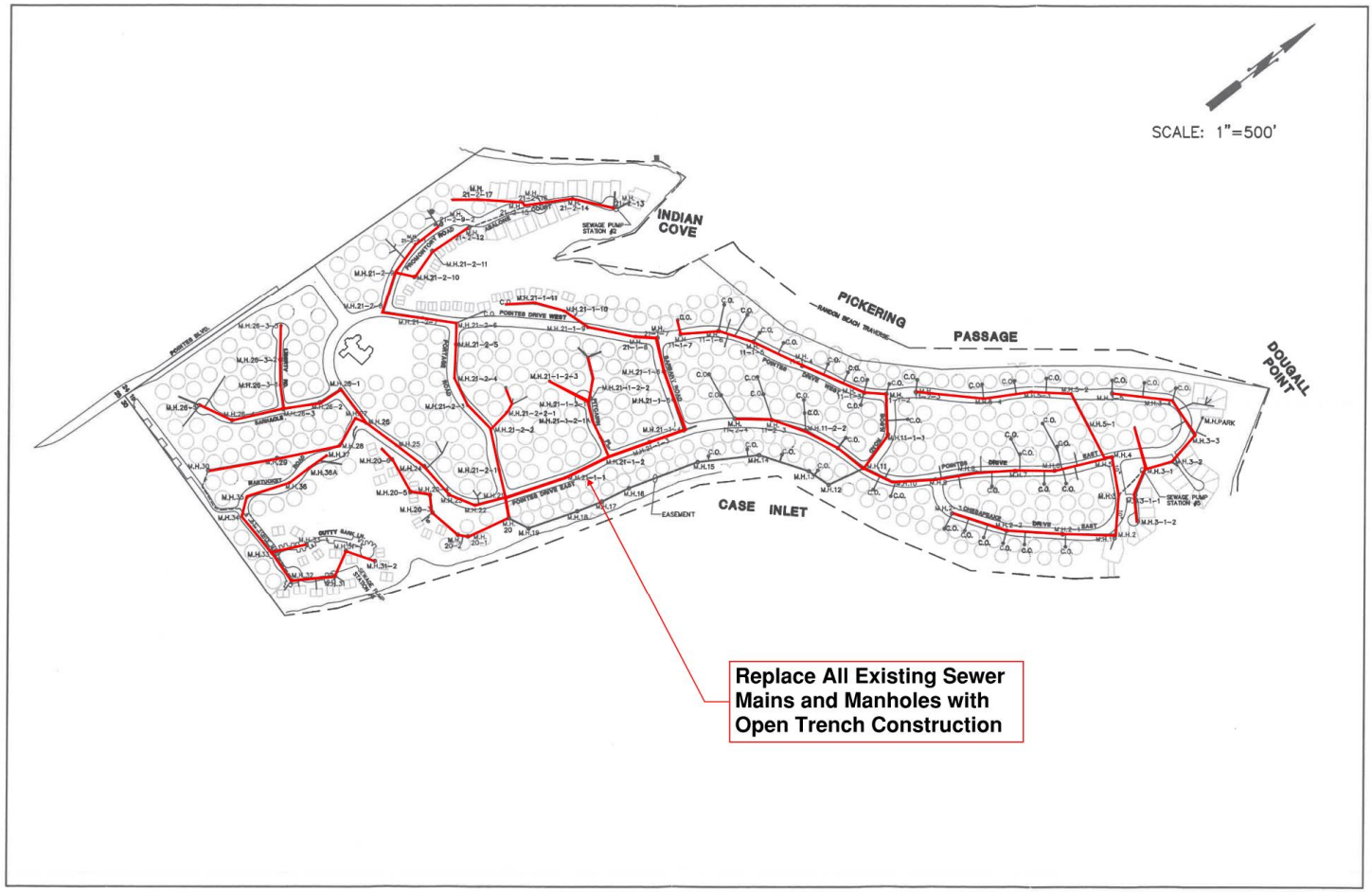


Figure 4-4: Alternative 2 Open Trench Gravity Sewer Replacement

d. Environmental Impacts

This alternative requires extensive excavation and large-scale disruption of the ground surface. As with other conventional excavation projects, the environmental impacts would be temporary, but this alternative has a longer construction schedule, and disrupts much more surface area than the other alternatives.

e. Land Requirements

This alternative follows along the existing pipeline in existing rights-of-way and easements, so no land acquisition is needed.

f. Potential Construction Problems

Open trench replacement adds a host of issues to the project including utility relocations, roadway interruptions, and repairs, and sewer service interruptions. The corridor through which this sewer main runs is congested and narrow in certain locations. Navigating around utilities on the shoulder or within the roadway would be costly and time consuming.

g. Sustainability Considerations

This project reconstructs a gravity sewer system, so there are no long-term energy impacts. During construction, the extensive excavation, trenching, backfill, and surface restoration will consume much more energy than the other alternatives.

h. Cost Estimates

This is by far the most expensive option investigated in this analysis. In addition to the overall high cost of the piping, the excavation, traffic control, and bypass pumping, there is a high potential for construction problems and unforeseen conflicts that could drive the cost up significantly. The below is a unit cost breakout of an estimated open trench replacement cost for this project.

Collection System Refurbishment

Alternative 2: Open Trench Reconstruction

PLANNING LEVEL COST ESTIMATE

	DESCRIPTION OF ITEM	EST. QTY.	UNITS	UNIT PRICE	AMOUNT
1	Mobilization	1	LS	$850,000.00	$850,000.00
2	Clearing and Grubbing	1	AC	$25,000.00	$25,000.00
3	Trench Excavation & Backfill, 0-10 Ft Depth	22,300	LF	$55.00	$1,226,500.00
4	Pipe Bedding	22,300	LF	$10.00	$223,000.00
5	8-Inch PVC Sewer Main, D 3034, SDR 35	22,300	LF	$55.00	$1,226,500.00
6	Concrete Manhole, 48-Inch Diameter, 10' depth	110	EA	$6,800.00	$748,000.00
7	Service Line Trench Excavation & Backfill	33,500	LF	$45.00	$1,507,500.00
8	Service Line Bedding	33,500	LF	$6.00	$201,000.00
9	4-Inch PVC Sewer Service Pipe	33,500	LF	$12.00	$402,000.00
10	Asphalt Repair, 3-Inch Depth, 22-Foot width	56,222	SY	$45.00	$2,529,990.00
11	Crushed Surfacing Top Course, 4-Inch Depth	6,240	CY	$105.00	$655,200.00
12	Surface Restoration, Hydroseed	10	AC	$11,000.00	$110,000.00
13	Traffic Control	120	DAY	$1,500.00	$180,000.00
14	Trench Dewatering	120	DAY	$3,000.00	$360,000.00
15	Temporary Sewage Bypass Pumping	120	DAY	$2,500.00	$300,000.00
16	Spill Prevention, Control, and Countermeasures	1	LS	$20,000.00	$20,000.00
				CONSTRUCTION TOTAL	**$10,564,690.00**
				CONSTRUCTION CONTINGENCY, 25%	**$2,641,200.00**
				SALES TAX 8.5%	**$1,122,500.65**
				ENGINEERING DESIGN	**$1,716,800.00**
				CONSTRUCTION MANAGEMENT & INSPECTION	**$1,584,800.00**
				TOTAL ESTIMATED CAPITAL COST	**$17,630,000.00**

4B.3 Alternative 3 – Pipe Bursting

a. Description

Pipe bursting is a trenchless installation method, where a cutting head is pulled through the existing pipe to split it open, and new pipe is pulled along behind the cutting head. The existing manhole locations are used as receiving and sending pits. This replaces the sewer main between the manholes without trench excavation. However, excavation is still required at the manholes, and each side sewer must still be replaced by open trench excavation.

This option is more feasible than full open trenching or no action, but does still require the removal and replacement of all manholes along the stretch as well as the trench excavation to replace services at all locations. For these reasons this option is less desirable than the preferred option as it still leaves ample room for error in the relocation of utilities and the potential for construction issues at each excavation point.

This alternative has results similar to other scenarios in that a I&I will be reduced and a long-lived resilient asset is place. However, it still requires a significant amount of excavation and surface disruption.

b. Design Criteria

The new pipe installed by the pipe bursting method will be HDPE, which is more flexible than PVC. The diameter of the new pipe will be the same as the old pipe. The pipe will also be laid at the same grade, as it is essentially sleeved inside the old pipe.

All the old manholes along the replaced segments will be dug up and disposed, with new water-tight manholes installed after the pipe is installed.

c. Map

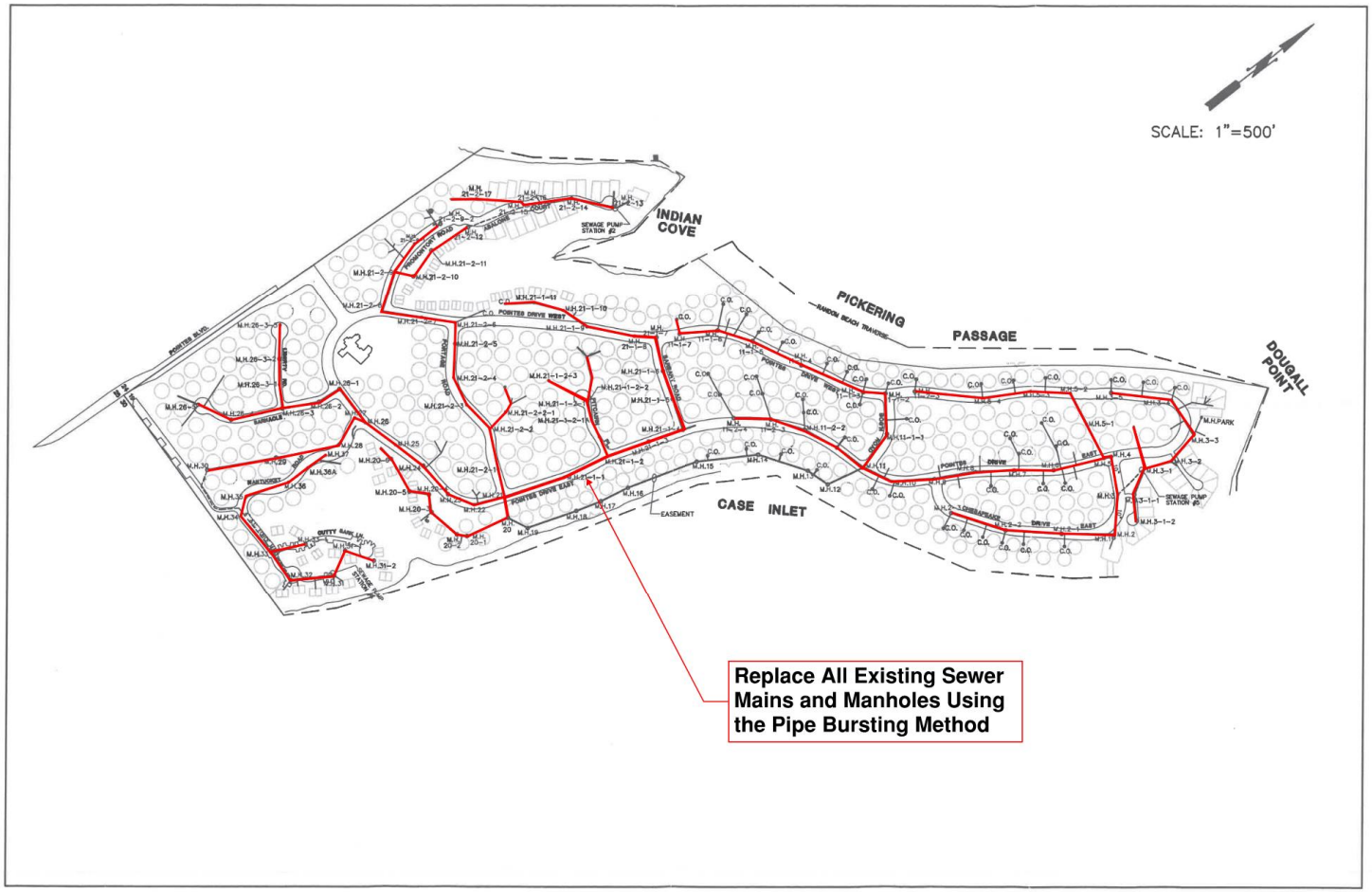


Figure 4-5: Alternative 3 Replacement by Pipe Bursting

d. Environmental Impacts

Even though pothole excavation is required at each manhole and service connection, the total disturbed area is much smaller than standard open trench construction. This results in reduced impacts to the environment, less stormwater to manage, and smaller areas of surface restoration.

e. Land Requirements

This alternative places pipe within the existing pipeline and stays within existing rights-of-way and easements, so no land acquisition is needed.

f. Potential Construction Problems

Pipe bursting is dependent on the existing soils having enough give that the old pipe can be split open, and the new pipe pulled through inside it. Some soil types are less suitable to this process. Also, the presence of large rocks too close to the pipe, or metal fittings that are sometimes used for repairs can cause problems with pipe bursting.

As this alternative places the new pipe inside of the old pipe, sewer service must be cut off for a time at the segment being worked on, and sewer flows upstream from the project must be bypass pumped around the project.

Although the amount of excavation is much less than conventional construction, reconnecting service lines and replacing manholes will require excavation, and the possibility of interference from other buried utilities.

g. Sustainability Considerations

This alternative results in a new gravity sewer pipe, and has no long-term energy demands. While under construction, the energy demands will be much lower then open-trench construction due to the reduced amount of excavation.

h. Cost Estimates

While this alternative is somewhat more affordable than open trenching this option is still more expensive than the preferred alternative. The requisite replacement of all manholes and trench excavation at each service connection make this option difficult to adopt.

Below is a cost estimate for the bursting alternative which is significantly less than open trench replacement.

Collection System Refurbishment

Alternative 3: Pipe Bursting

PLANNING LEVEL COST ESTIMATE

	DESCRIPTION OF ITEM	EST. QTY.	UNITS	UNIT PRICE	AMOUNT
1	Mobilization	1	LS	$650,000.00	$650,000.00
2	Clearing and Grubbing	1	AC	$25,000.00	$25,000.00
3	Pipeline Flushing & Inspection	22,300	LF	$8.00	$178,400.00
4	Pipe Bursting with 8-Inch HDPE Pipe	22,300	LF	$135.00	$3,010,500.00
5	Pulling Pit Excavation	110	EA	$1,100.00	$121,000.00
6	Concrete Manhole, 48-Inch Diameter, 10' depth	110	EA	$6,800.00	$748,000.00
7	Service Line Trench Excavation & Backfill	33,500	LF	$45.00	$1,507,500.00
8	Service Line Bedding	33,500	LF	$6.00	$201,000.00
9	4-Inch PVC Sewer Service Pipe	33,500	LF	$12.00	$402,000.00
10	Asphalt Repair, 3-Inch Depth, 16 SY patches	8,880	SY	$45.00	$399,600.00
11	Crushed Surfacing Top Course, 4-Inch Depth	1,000	CY	$105.00	$105,000.00
12	Surface Restoration, Hydroseed	10	AC	$11,000.00	$110,000.00
13	Traffic Control	120	DAY	$1,500.00	$180,000.00
14	Trench Dewatering	60	DAY	$500.00	$30,000.00
15	Temporary Sewage Bypass Pumping	120	DAY	$2,500.00	$300,000.00
16	Spill Prevention, Control, and Countermeasures	1	LS	$20,000.00	$20,000.00
				CONSTRUCTION TOTAL	**$7,988,000.00**
				CONSTRUCTION CONTINGENCY, 25%	**$1,997,000.00**
				SALES TAX 8.5%	**$848,725.00**
				ENGINEERING DESIGN	**$1,298,100.00**
				CONSTRUCTION MANAGEMENT & INSPECTION	**$1,198,200.00**
				TOTAL ESTIMATED CAPITAL COST	**$13,331,000.00**

4B.4 Alternative 4 – CIPP Lining

a. Description

This alternative utilizes the Cured-In-Place-Pipe (CIPP) lining process to restore the function of the existing sewer main. In this process, the existing pipe is used as a conduit for a flexible liner that is pulled through the pipe between manholes. The liner is expanded to the full diameter of the pipe, and then cured in place to form a liner that runs the full length of the pipe without joints. After curing, a remote cutter travels through the pipe and cuts openings in the pipe at each side sewer entrance. Each side sewer then receives a similar treatment with the liner pulled between a "T" liner at the main and a cleanout installed at each property line. The result is a fully lined pipe capable of lasting up to 50 years without any major ground disturbance and minimal service interruptions.

This option is highly feasible as it will provide minimal down time (lower cost of traffic control and bypass pumping), long service life (50 years), and a minimum of extraneous construction and environmental requirements.

b. Design Criteria

Due to the high groundwater that contributes to the excess I&I, the structural integrity of the CIPP liner must be considered. After the pipe is lined, the groundwater level may rise, as it no longer has an easy path to drainage. While the existing pipe has adequate strength to resist collapse from soil loads, the liner must be able to withstand the hydraulic pressure exerted by groundwater. Design tables by the CIPP Corporation indicate that an 8" diameter pipe lined with a 6 mm (0.263 inch) thick CIPP will withstand a groundwater load up to 40 feet of depth. The sewer pipes in Hartstene Pointe are not more than 10 to 12 feet deep, so the standard nominal thickness of 6mm is adequate for this installation.

c. Map

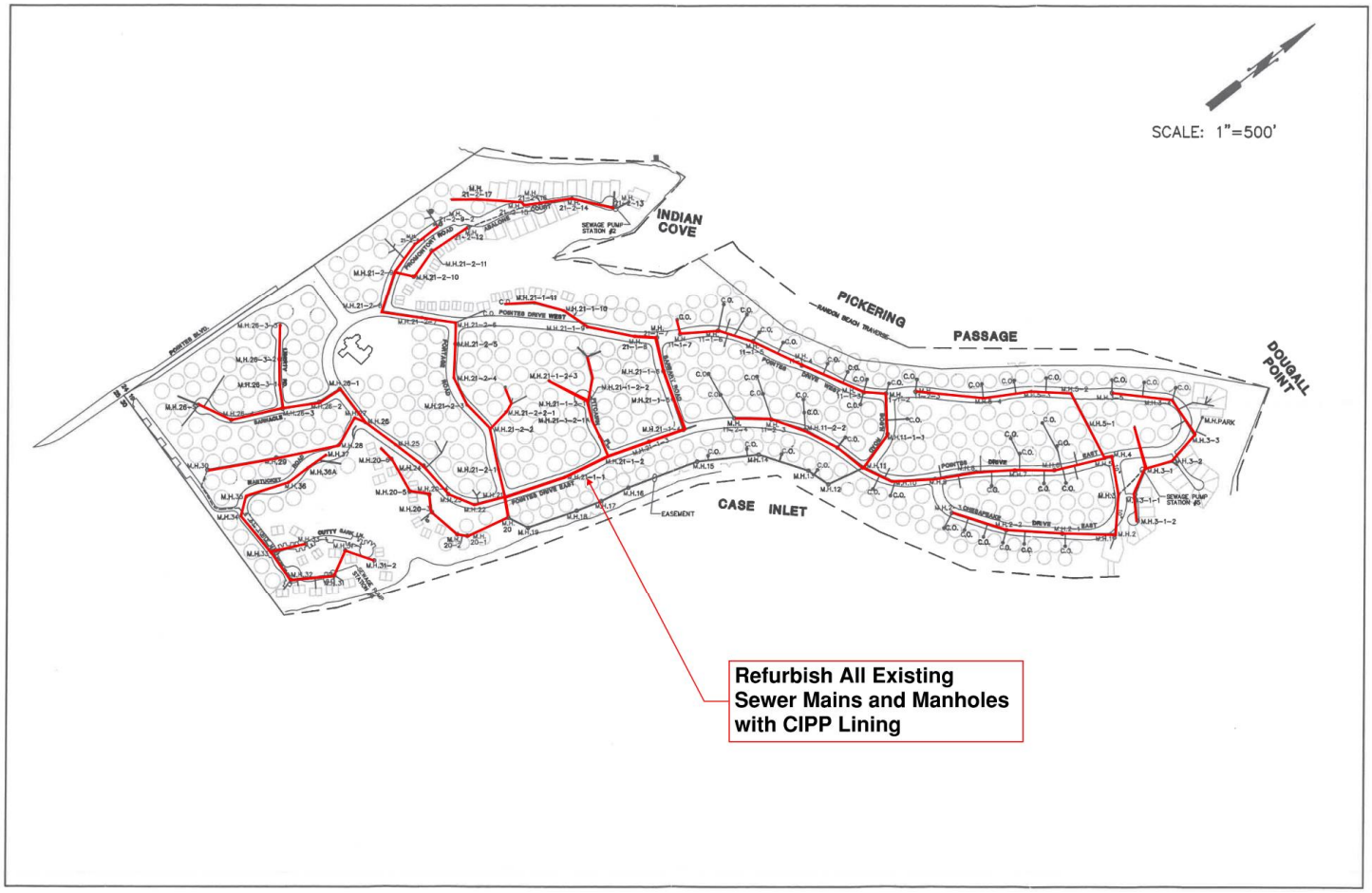


Figure 4-6: Alternative 4 Refurbishment by CIPP Lining

d. Environmental Impacts

This alternative does not require excavation except to install service line cleanouts, and requires minimal surface disturbance. This alternative has the lowest environmental impacts of the available options. Eliminating major ground disturbance also reduces environmental and section 106 reviews to a much lower level, simplifying the effort required for regulators, tribes, and interested parties.

e. Land Requirements

The CIPP liner stays within the existing pipe and manholes, so no land acquisition is required.

f. Potential Construction Problems

The CIPP process depends on the existing pipe being structurally sound and relatively straight, with no major breaks or offset joints. Previous video surveys of this system indicate that the pipes meet the requirements and are good candidates for the CIPP process.

The new pipe liner is placed inside of the old pipe, and so sewer service must be cut off for a time at the segment being worked on, and sewer flows upstream from the project must be bypass pumped around the project.

g. Sustainability Considerations

This alternative also results in a gravity sewer system with no operational energy requirements. This alternative has the lowest energy use during construction due to the absence of excavation.

h. Cost Estimates

CIPP lining represents a fraction of the construction and design cost of other methods of construction while delivering a comparable end product. By installing single liner socks from one existing manhole to the next and restoring services by robotic cutter technology, the District can maximize their existing infrastructure and service levels while still obtaining a beneficial end product.

As illustrated in the below cost estimate this alternative is by far the most cost effective.

Collection System Refurbishment

Alternative 4: Cured-in-Place-Pipe (CIPP) Lining

PLANNING LEVEL COST ESTIMATE

	DESCRIPTION OF ITEM	EST. QTY.	UNITS	UNIT PRICE	AMOUNT
1	Mobilization	1	LS	$620,000.00	$620,000.00
2	Pipeline Flushing & Inspection	22,500	LF	$8.00	$180,000.00
3	CIPP Lining	22,500	LF	$75.00	$1,687,500.00
4	Manhole Lining	110	EA	$1,500.00	$165,000.00
5	Service Line Cleanout	445	EA	$800.00	$356,000.00
6	Service Line T Liner	445	EA	$2,800.00	$1,246,000.00
7	Service Line CIPP Liner	33,500	LF	$95.00	$3,182,500.00
8	Traffic Control	120	DAY	$500.00	$60,000.00
9	Temporary Sewage Bypass Pumping	120	DAY	$2,500.00	$300,000.00
10	Spill Prevention, Control, and Countermeasures	1	LS	$20,000.00	$20,000.00
					$0.00
				CONSTRUCTION TOTAL	**$7,817,000.00**
				CONSTRUCTION CONTINGENCY, 25%	**$1,954,300.00**
				SALES TAX 8.5%	**$830,560.50**
				ENGINEERING DESIGN	**$1,074,900.00**
				CONSTRUCTION MANAGEMENT & INSPECTION	**$1,172,600.00**
				TOTAL ESTIMATED CAPITAL COST	**$12,850,000.00**

5. Recommended Alternative

PART A – BLUFF SEWER LINE REPLACEMENT

The alternatives to relocate the Bluff Sewer Line differ widely in both their capital costs and operating costs. To provide a fair evaluation, the life cycle costs should be considered. The Net Present Value as listed below provides the life cycle costs assuming a 20-year life cycle, including immediate capital costs as well as operating costs over the next 20 years.

Table 5-1: Bluff Sewer Line Replacement Alternative Comparison

Alternative	Capital Costs	Annual O&M Costs	Net Present Value
Alt 1: Gravity Sewer & Gravity Services	$ 3,011,000	$ 1,000	$ 3,030,586
Alt 2: Community Lift Station & Grouped Grinder Services	$ 1,896,000	$ 11,900	$ 2,129,074
Alt 3: Gravity Sewer & Grouped Grinder Services	$ 2,973,000	$ 8,600	$ 3,141,440

Alternative 2, Community Lift Station and Grouped Grinder Pump Services is lowest in cost, both for immediate capital expenses, and throughout the life cycle. Additionally, it has the lowest impacts to the environment, and less disruption to roads, trees, and services. This combination of lowest cost and lowest impacts make **Alternative 2, Community Lift Station and Grouped Grinder Pump Services** the preferred alternative for relocating the bluff sewer main.

PART B – I & I REDUCTION

Each of the alternatives would replace or refurbish the existing line along the same alignment. Each alternative will result in a gravity sewer system that will greatly reduce or eliminate I&I. The O&M expenses will be minimal and essentially the same for all the alternatives, so detailed O&M and life cycle cost analysis is unnecessary.

Based on the discussion and criteria explored in the analysis above, the clear recommendation is a CIPP liner installation for the full collection system. In addition to being the least expensive alternative, it also has the lowest impact to the environment, least disruption to traffic, and lowest potential for construction problems. For these reasons **Alternative 4 CIPP Lining** is recommended.

Table 5-2: I&I Reduction Alternative Comparison

Alternative	Capital Costs	Environmental Impact	Service Disruption	Const. Problem Potential
Alt 1: Open Trench Construction	$ 17,630,000	High	High	High
Alt 2: Pipe Bursting	$ 13,331,000	Moderate	Moderate	Moderate
Alt 3: CIPP Lining	$ 12,850,000	Low	Low	Low

6. Funding Options and the Path Forward

a. Funding Options

The excessive I&I issues and potential for structural pipe failure has led the District to work with their on-call consulting engineer to develop a funding strategy and plan of action to address these conditions. The projected capital cost of the two recommended improvements (Lift Station with Grouped Grinder Stations and CIPP Lining) is $14,746,000. Potential funding sources are considered in the following sections.

i. Self-Funding

The District maintains several funds that serve as reserves for existing debt service obligations, and funds that are set aside for continuing operations and repairs. As of the 2022 budget, the set-aside for I&I repairs is approximately $89,000. While this would cover the repairs of a very small area, it is just a fraction of the total cost of system-wide repairs. Existing reserves are inadequate to fund a full-scale improvement project.

ii. Commercial Loan

A loan from the commercial market is a possible way to fund the improvements. However, recent increases in interest rates has made this less attractive. The debt service on a 30-year loan at 5.0% APR to cover the capital costs would increase monthly rates by $177.89 to $267.09 per month, an increase of 207%. This dramatic increase is not feasible for the rate payers.

iii. CDBG

Community Development Block Grant (CDBG) funding is limited to serving low- and moderate-income persons. To be eligible for funding, at least 51% of the residents in the service area would need to fall into the category of low- and moderate-income. According to currently available American Community Service data, only 33.82% of residents fall in this category, so the District is not eligible to receive CDBG funds.

iv. CWSRF

The Clean Water State Revolving Fund (CWSRF) as administered by the Department of Ecology, is a potential funding source. The funding is primarily in the form of low interest loans, but in certain situations, applicants may be eligible to receive principal forgiveness for a portion of the loan, or may qualify for a Centennial Grant to cover certain costs. For this scenario, it is assumed that the District will receive 25% grant funding/principal forgiveness totaling $3,687,000; and will finance the remaining $11,059,000 at the current standard SRF rate of 1.6% APR. This would increase the debt service by $89.97 per connection per month.

v. USDA-RD

USDA-Rural Development has funding programs that typically include a small grant accompanied with a low-interest loan to fund wastewater improvement projects. Although the grant/loan ratio can vary, 25% grant to 75% loan is fairly typical, and will be used for this analysis. Additionally, loan interest rates and terms will vary, but will be assumed at 2.5% APR for 30 years. Under this scenario, the District would receive $3,687,000 in grant funds, and would finance $11,059,000. The debt service on this loan would increase monthly rates by $98.20 to $187.40 per month, a 115% increase over the existing rate.

vi. Rate Impacts

The table below summarizes the potential monthly sewer rates based on the funding source. The Actual funding package may differ from these projections. The Projected Cost columns also show the increased operating costs for the preferred alternative (Community Lift Station and Grouped Grinder Pump Services).

Table 6-1: Projected Cost per Service

Budget Category	Existing Monthly Cost per Connection	Projected Cost per Connection – Commercial Loan	Projected Cost per Connection – CWSRF Funding	Projected Cost per Connection – USDA RD Funding
WW Operating Costs	$14.66	$16.89	$16.89	$16.89
Combined Operating Costs WW	$11.55	$11.55	$11.55	$11.55
WW Staff Costs	$39.56	$39.56	$39.56	$39.56
Capital Improvements	$9.73	$9.73	$9.73	$9.73
Debt Service	$7.14	$185.03	$94.11	$105.34
Reserves	$4.33	$4.33	$4.33	$4.33
Total	**$86.97**	**$267.09**	**$176.17**	**$187.40**

b. Environmental Review

i. SEPA

Before the District acts on a proposed project, an environmental review of the proposal must be completed. To comply with this, a checklist will be completed in accordance with the State Environmental Policy Act (SEPA). This review will take place during the design phase of the project, as specific project locations and alignments are finalized. The checklist review will determine if the project will result in significant impacts and if mitigation of the impacts is required. A public comment period will be publicized to allow concerned parties and agencies to comment on the determination.

ii. SERP

If funding is provided by the Clean Water State Revolving Fund (CWSRF), a State Environmental Review Process (SERP) will be performed in addition to the SEPA review process. A SERP review requires additional documentation for public outreach and community engagement. Environmental Justice requirements will also be considered.

Appendix A

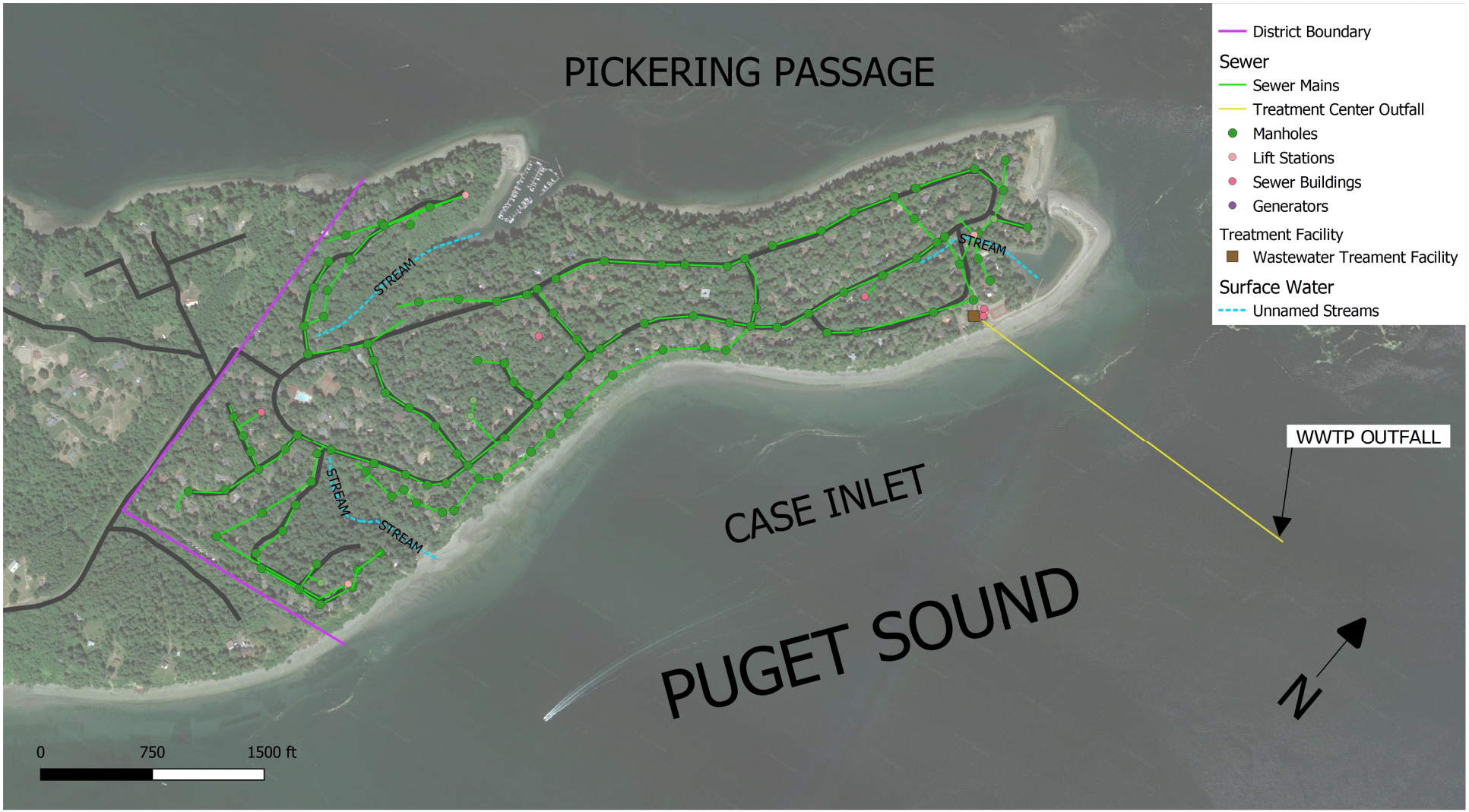
Maps

CENTURY WEST ENGINEERING

DSGND BY: DR	CHCKD BY: DR	HARTSTENE POINTE WATER-SEWER DISTRICT
DRWN BY: JR	SCALE:	SERVICE AREA TOPOGRAPHY
PROJECT NO:		

CENTURY WEST ENGINEERING

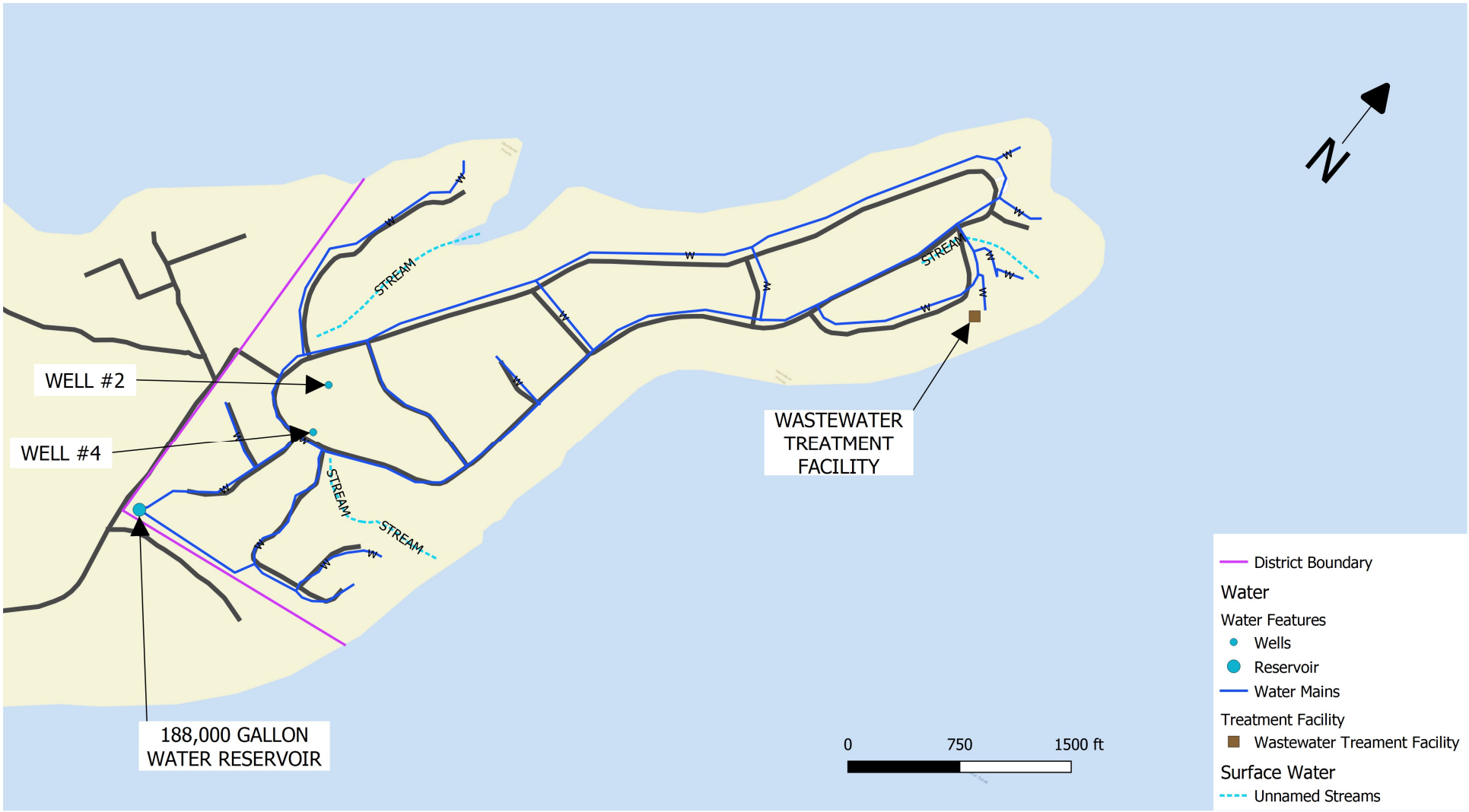
DATE: 09/29/2022 SHEET:



DSGND BY: DR	CHCKD BY: DR	HARTSTENE POINTE WATER-SEWER DISTRICT
DRWN BY: JR	SCALE:	SURFACE WATER FEATURES
PROJECT NO:		

CENTURY WEST ENGINEERING

DATE: 09/29/2022 SHEET:



DSGND BY: DR	CHCKD BY: DR	HARTSTENE POINTE WATER-SEWER DISTRICT	CENTURY WEST ENGINEERING
DRWN BY: JR	SCALE:	WATER SYSTEM FACILITIES	DATE: 09/29/2022 SHEET:
PROJECT NO:			

Appendix B

Annual Budget

CENTURY WEST ENGINEERING

Hartstene Pointe Water - Sewer District

Dedicated to Service

2022 Proposed Budget Overview

Revenues

	2021 Projected Actual	2021 Budget	2022 Budget	2023	2024	2025	2026
Water Sales	448,220	438,900	*460,344*	473,801	489,229	504,999	521,380
Sewer Sales	408,351	405,438	*471,146*	509,276	525,820	542,710	560,215
Penalties / Fees	1,791	1,848	*1,947*	2,055	2,122	2,190	2,261
Connection Fees / Misc.	51,100	7,800	*7,800*	7,800	7,800	7,800	7,800
Interest Income	500	3,735	*3,735*	3,735	3,735	3,735	3,735
Total Revenues:	$ 909,962	$ 857,721	*$ 944,973*	$ 996,667	$1,028,706	$1,061,434	$1,095,391

Operating Expenditures

	2021 Projected Actual	2021 Budget	2022 Budget	2023	2024	2025	2026
Staff	245,399	382,025	*398,346*	317,736	317,736	317,736	317,736
Water	57,114	50,006	*57,722*	55,414	57,354	59,361	61,439
Wastewater Treatment/Sewer	74,174	82,382	*78,304*	81,044	83,881	86,817	89,855
Combined W/S, Admin.	106,256	105,111	*118,658*	155,860	161,869	168,127	174,645
Total Operating Expenses:	$ 482,944	$ 619,524	*$ 653,030*	$ 610,055	$ 620,840	$ 632,041	$ 643,675

Capital Expenditures

	2021 Projected Actual	2021 Budget	2022 Budget	2023	2024	2025	2026
Drinking Water	58,140	25,000	*68,800*	20,000	20,000	-	-
Wastewater / Sewer	29,228	95,000	*30,000*	45,000	45,000	-	-
Combined W/S	29,920	50,000	*42,222*	-	-	-	-
Total Capital Expenses:	$ 117,288	$ 170,000	*$ 141,022*	65,000	65,000	-	-
Debt Service Payments:	$ 158,873	$ 158,873	*$ 157,888*	$ 156,903	$ 155,918	$ 154,933	$
TOTAL EXPENDITURES	$ 759,105	$ 948,397	*$ 951,940*	$786,958	$796,758	$786,974	$721,116
Net Gain (Loss):	166,718	(90,676)	*6,264*	215,587	238,001	280,692	380,691

For the complete 2020 Proposed Budget, visit hpwatersewer.com or call (360) 427-2413

Beginning Fund Balances

	2021 Actual	2021 Budget	2022 Budget	2023	2024	2025	2026
***Operating Account**	117,711	128,222	*293,181*	266855	449852	606919	806676
Asset Replacement Fund	48,540	48,540	*18,344*	9,000	18,000	27,000	36,000
Capital Improvement	137,332	170,659	*146,862*	172,411	197,959	253,508	309,056
Risk Management Fund	139,511	149,228	*149,769*	162,222	174,675	187,128	199,581
Total Beginning Balances:	$ 443,094	$ 496,648	*$ 443,094*	$ 610,488	$ 822,142	$1,056,211	1,332,969

**Operating Account includes All Revolving Funds*

Ending Fund Balances

	2021 Projected Actual	2021 Budget	2022 Budget	2023	2024	2025	2026
***Operating Account**	128,222	65,997	*266,855*	449,852	606,919	806,676	1,106,433
Asset Replacement Fund	48,540	57,540	*9,000*	18,000	27,000	36,000	45,000
Capital Improvement	170,659	173,216	*172,411*	227,960	283,508	339,056	394,605
Risk Management Fund	149,228	161,681	*162,222*	174,675	187,128	199,581	212,034
Total Ending Balances:	496,648	464,203	*610,488*	777,142	966,211	1,197,969	1,529,728

**Operating Account includes All Revolving Funds*

Hartstene Pointe Water-Sewer District

2022 Final Budget Overview

	2019 Actual	2020 Actual	*2021 Projected*	Budget 2021	Budget 2022	Projections 2023	2024	2025	2026
Beginning Unreserved Funds Balance	440,789	459,899	443,094	459,899	608,157	610,428	777,052	966,091	1,197,819
Revenues	742,555	776,605	*925,823*	857,721	958,144	1,002,515	1,034,729	1,067,636	1,101,778
Expenditures	671,371	720,880	*759,105*	948,397	951,940	831,958	841,758	831,974	842,623
Net Income (Loss)	71,184	55,725	*166,718*	(90,676)	6,204	170,557	192,971	235,662	259,154
Ending Unreserved Funds Balance	459,899	443,094	*608,157*	464,203	610,428	777,052	966,091	1,197,819	1,453,041

Rev. 11/22/21

Harstene Pointe Water-Sewer District

Beginning Fund Balances

	History			Budget	Difference		Projections			
	2019 Actual	2020 Actual	2021 Actual	2022	$ Change	% Change	2023	2024	2025	2026
Beginning Fund Balances										
Reserve Funds										
030 - Ecology Loan Reserve	39,327	40,215	40,511	40,556	45	0.11%	40,556	40,556	40,556	40,556
050 - DWSRF Loan Reserve	20,452	22,009	20,431	20,372	(59)	-0.29%	20,372	20,372	20,372	20,372
070 - USDA Revenue Bond Reserve	25,095	29,630	33,787	35,456	1,668	4.94%	39,389	43,322	47,255	51,188
Unreserved Funds										
010 - Operating Fund (incl. revolving funds)	148,728	136,962	117,711	293,181	175,470	149.07%	266,795	356,418	468,455	623,182
020 - Committed Funds										
Asset Replacement Fund	30,540	39,540	48,540	18,344	(30,196)	-62.21%	9,000	18,000	27,000	36,000
Capital Improvement Fund										
Inflow & Infiltration	69,540	89,540	80,617	76,821	(3,796)	-4.71%	89,043	131,265	173,487	215,709
Reservoir Repair	70,889	56,715	56,715	70,041	13,326	23.50%	83,368	96,694	110,021	123,347
Other	0	0	0	0	0	0.00%	0	0	0	0
Risk Management Fund	121,092	137,142	139,511	149,769	10,258	7.35%	162,222	174,675	187,128	199,581
Total 020 - Committed Funds	292,062	322,937	325,383	314,976	(10,407)	-3.20%	343,633	420,634	497,636	574,637
065 - Capital Projects Account	0	0	0	0	0	0.00%	0	0	0	0
Total Beginning Unreserved Fund Balances	440,789	459,899	443,094	608,157	165,063	37.25%	610,428	777,052	966,091	1,197,819

Rev. 11/22/21

Rev. 11/22/21

Hartstene Pointe Water-Sewer District

Ending Fund Balances

	History			Budget		Difference		Projections			
	2019 Actual	2020 Actual	2021 Projected	2021	2022	$ Change	% Change	2023	2024	2025	2026
Ending Fund Balances											
Reserve Funds											
030 - Ecology Loan Reserve	40,215	40,511	40,556	40,475	40,556	81	0.20%	40,556	40,556	40,556	40,556
050 - DWSRF Loan Reserve	22,009	20,431	20,372	20,388	20,372	(16)	-0.08%	20,372	20,372	20,372	20,372
070 - USDA Revenue Bond Reserve	29,630	33,787	35,456	37,691	39,389	1,698	4.50%	43,322	47,255	51,188	55,121
Unreserved Funds											
010 - Operating Fund (incl. revolving funds)	136,962	117,711	293,181	65,997	266,795	200,798	304.25%	356,418	468,455	623,182	801,402
020 - Committed Funds											
Asset Replacement Fund	39,540	48,540	18,344	57,540	9,000	(48,540)	-84.36%	18,000	27,000	36,000	45,000
Capital Improvement Fund											
Inflow & Infiltration	89,540	80,617	76,821	95,617	89,043	(6,574)	-6.88%	131,265	173,487	215,709	257,931
Reservoir Repair	56,715	56,715	70,041	83,368	83,368	(0)		96,694	110,021	123,347	136,674
Other	0	0	0	0	0	0	0.00%	0	0	0	0
Risk Management Fund	137,142	139,511	149,769	161,681	162,222	541	0.33%	174,675	187,128	199,581	212,034
Total 020 - Committed Funds	322,937	325,383	314,976	398,206	343,633	(54,573)	-13.70%	420,634	497,636	574,637	651,639
065 - Capital Projects Account	0	0	0	0	0	0	0.00%	0	0	0	0
Total Ending Unreserved Fund Balances	459,899	443,094	608,157	464,203	610,428	146,225	31.50%	777,052	966,091	1,197,819	1,453,041

Rev. 11/22/21

777,142	966,211	1,197,969	1,529,728

Hartstene Pointe Water-Sewer District

Revenues

		History				Budget		Difference		Projections			
		2019 Actual	2020 Actual	*2021 Jan - Sept*	2021 Projected	2021	2022	$ Change	% Change	2023	2024	2025	2026
1	Rates												
2	Residential Water (Bi-monthly)	133.80	*144.10*	*162.80*	162.80	162.80	161.26	(1.54)	-0.94%	175.00	180.30	185.70	191.30
3	Residential Sewer (Bi-monthly)	123.70	*133.20*	*150.50*	150.50	150.50	173.94	23.44	15.57%	188.70	194.40	200.20	206.20
4	**Total Residential Bi-monthly Bill**	**257.50**	**277.30**	***313.30***	***313.30***	**313.30**	**335.20**	**21.90**	**6.99%**	**363.70**	**374.70**	**385.90**	**397.50**
5	**Total Residential Monthly Charge**	**128.75**	**138.65**	***156.65***	**156.65**	**156.65**	**167.60**	**10.95**	**6.99%**	**181.85**	**187.35**	**192.95**	**198.75**
6	Prepaid Connection - Water (Bi-monthly)	56.70	*61.10*	*69.00*	*69.00*	69.00	73.80	4.80	6.96%	80.10	82.50	85.00	87.60
7	Prepaid Connection - Sewer (Bi-monthly)	50.50	*54.40*	*61.50*	*61.50*	61.50	65.80	4.30	6.99%	71.40	73.50	75.70	78.00
8	**Total Prepaid Connection Bi-monthly Bill**	**107.20**	***115.50***	***130.50***	***130.50***	**130.50**	**139.60**	**9.10**	**6.97%**	**151.50**	**156.00**	**160.70**	**165.60**
9	**Total Prepaid Connection Monthly Charge**	**53.60**	**57.75**	***65.25***	***65.25***	**65.25**	**69.80**	**4.55**	**6.97%**	**75.75**	**78.00**	**80.35**	**82.80**
10	Water - Metered Charges	0	0	*3,524*	*6,124*	0	21,600	**21,600**	**#DIV/0!**	23,436	24,139	24,863	25,609
11	Water Connection & Capital Facilities Charge	*3,490*	3,490	*3,670*	*3,670*	3,670	3,340	(330)	-8.99%	3,340	3,340	3,340	3,340
12	Sewer Connection & Capital Facilities Charge	*3,810*	3,810	*4,130*	*4,130*	4,130	4,460	330	7.99%	4,460	4,460	4,460	4,460
13	**Total Connection & Capital Facilities Charge**	***7,300***	**7,300**	***7,800***	***7,800***	**7,800**	**7,800**	**0**	**0.00%**	**7,800**	**7,800**	**7,800**	**7,800**
14	Connections												
15	# of Residential Connections	436	*440*	*440*	442	440	445	5	1.14%	446	447	448	449
16	# of Prepaid Connections	18	*22*	*22*	25	22	25	3	13.64%	18	18	18	18
17	# of New Connections (not Prepaid)	5	2	*7*	7	1	2	1	100.00%	1	1	1	1
18	Revenues												
19	Total Water Revenues	359,889	389,747	*336,419*	448,220	438,900	463,247	24,347	5.55%	476,951	492,475	508,342	524,823
20	Total Sewer Revenues	334,290	358,630	*309,935*	408,351	405,438	474,277	68,839	16.98%	512,672	529,319	546,313	563,927
21	Total Penalties & Fees	4,841	2,725	*881*	1,174	1,848	1,285	(563)	-30.44%	1,357	1,401	1,446	1,493
22	Capital Facilities Charges & Connection Fees	33,700	21,912	*51,100*	51,100	7,800	15,600	7,800	100.00%	7,800	7,800	7,800	7,800
23	Interest Income	9,834	3,515	*401*	534	3,735	3,735	0	0.00%	3,735	3,735	3,735	3,735
24	Miscellaneous Revenues	0	76	*16,444*	16,444	0	0	0	0.00%	0	0	0	0
25	**Total Revenues**	**$742,555**	**$776,605**	***$715,178***	**$925,823**	**$857,721**	**$958,144**	**$100,423**	**11.71%**	**$1,002,515**	**$1,034,729**	**$1,067,636**	**$1,101,778**
					% Water Revenue:	51.98%	49.41%			48.20%	48.20%	48.20%	48.20%
					% Wastewater Revenue:	48.02%	50.59%			51.80%	51.80%	51.80%	51.80%

Rev. 11/22/21

Hartstene Pointe Water-Sewer District

Expenditures

		History				Budget		Difference		Projections			
		2019 Actual	2020 Actual	2021 Jan-Sept	*2021 Projected*	2021	2022	$ Change	% Change	2023	2024	2025	2026
1	Operations												
2	Staff	309,493	312,884	193,804	245,399	382,025	398,346	16,321	4.27%	317,736	317,736	317,736	317,736
3	Water	75,107	43,748	40,650	57,114	50,006	57,722	7,716	15.43%	55,414	57,354	59,361	61,439
4	Wastewater Treatment/Sewer	141,607	59,886	55,455	74,174	82,382	78,304	(4,078)	-4.95%	81,044	83,881	86,817	89,855
5	Combined W/S, Administrative	129,232	68,493	45,244	106,256	105,111	118,658	13,547	12.89%	155,860	161,869	168,127	174,645
6	Total Operations	357,139	485,011	335,154	482,944	619,524	653,030	33,506	5.41%	610,055	620,840	632,041	643,675
7	Capital Improvements	153,441	75,025	111,747	117,288	170,000	141,022	(28,978)	-17.05%	65,000	65,000	45,000	45,000
8	Loan Payments	160,791	160,843	19,665	158,873	158,873	157,888	(985)	-0.62%	156,903	155,918	154,933	153,948
9	**Total Expenditures**	**$671,371**	**$720,880**	**$466,566**	**$759,105**	**$948,397**	**$951,940**	**$3,543**	**0.37%**	**$831,958**	**$841,758**	**$831,974**	**$842,623**
	Total Water Expenditures:						326,909			246,299	174,206	175,160	176,183
	Total Wastewater Expenditures:						242,306			242,306	235,046	237,883	220,819
	Total Combined W/S, Administrative Expenditures:						382,726			382,726	422,706	428,715	434,972
	% Water:						54.44%			45.98%	46.34%	46.27%	47.32%
	% Wastewater:						45.56%			45.56%	53.66%	53.73%	52.68%

Rev. 11/22/21

Hartstene Pointe Water-Sewer District

Water Operations Costs

		History				Budget		Difference		Projections			
		2019 Actual	2020 Actual	*2021 Jan - Sept*	2021 Projected	2021	2022	$ Change	% Change	2023	2024	2025	2026
1	Water Operations Expenditures												
2	534.30 · Supplies - Water												
3	31 1010 · Supplies - Water												
4	35 1010 · Tools/Equip - Water	3,833	5,136	*1,940*	2,586								
5	31 1010 · Supplies - Water - Other	1,503	2,170	*4,822*	6,429								
6	Supplies - Water	5,336	7,306	6,761	9,015	5,000	5,000	0	0.00%	5,175	5,356	5,544	5,738
7	Chemicals - Water	4,032	5,484	*2,248*	3,818	5,000	5,000	0	0.00%	5,175	5,356	5,544	5,738
8	**Total 534.30 · Supplies - Water**	**9,368**	**12,789**	***9,010***	**12,833**	**10,000**	**10,000**	**0**	**0.00%**	**10,350**	**10,712**	**11,087**	**11,475**
9	534.40 · Services - Water												
10	Intergov Fees *(previously under 534.50)*												
11	53 1010 · Excise Tax - Water	17,664	19,978	*16,557*	22,076	21,041	23,179	2,139	10.17%	23,991	24,830	25,699	26,599
12	53 1020 · Permit Fees - Water	764	766	*776*	776	804	815	11	1.34%	843	873	903	935
16	534.50 · Intergov - Water - Other	0	0	*306*	408	0	428	428	#DIV/0!	443	459	475	492
13	Total Intergov Fees	18,428	20,744	*17,639*	23,260	21,845	24,423	2,578	11.80%	25,277	26,162	27,078	28,026
14	Other Services	0	280	*1,602*	1,602	0	1,682	1,682	#DIV/0!	0	0	0	0
15	Lab Testing - Water	1,009	2,589	*1,448*	1,931	1,500	1,500	0	0.00%	1,553	1,607	1,663	1,721
16	Repair & Maintenance - Water												
17	SCADA System - Water	2,469	1,473	*388*	388	2,500	2,500	0	0.00%	2,588	2,678	2,772	2,869
18	Other	3,084	8,441	*2,981*	6,989	4,000	7,000	3,000	75.00%	7,245	7,499	7,761	8,033
19	Total 48 1030 Repair & Maintenance - Water	5,553	9,914	*3,368*	7,377	6,500	9,500	3,000	46.15%	7,245	7,499	7,761	8,033
20	47 1010 · Electric - Water	9,390	9,314	*7,584*	10,112	10,161	10,618	457	4.49%	10,989	11,374	11,772	12,184
21	**Total 534.40 · Services - Water**	**34,380**	**42,840**	***31,641***	**44,280**	**40,006**	**47,722**	**7,716**	**19.29%**	**45,064**	**46,642**	**48,274**	**49,964**
22	**Total Water Operations Expenditures**	**$43,747**	**$55,629**	**$40,650**	**$57,114**	**$50,006**	**$57,722**	**7,716**	**15.43%**	**$55,414**	**$57,354**	**$59,361**	**$61,439**

Rev. 11/22/21

Hartstene Pointe Water-Sewer District
Wastewater Treatment Operations Costs

		History				Budget		Difference		Projections			
		2019 Actual	2020 Actual	*2021 Jan - Sept*	2021 Projected	2021	2022	$ Change	% Change	2023	2024	2025	2026
1	Wastewater Treatment Operations Expenditures												
2	535.30 · Supplies - WW Treatment												
3	31 3010 · Supplies - WW Treatment												
4	Sewer	10	90	*517*	517								
5	31 3010 · Supplies - WW Treatment - Other	2,583	11,926	*2,240*	2,987								
6	31 3010 · Supplies - WW Treatment	11,943	12,016	*2,758*	3,504	10,000	10,000	0	0.00%	10,350	10,712	11,087	11,475
7	31 3011 · Chemicals - WW Treatment	1,523	1,522	*3,077*	3,077	2,000	2,000	0	0.00%	2,070	2,142	2,217	2,295
8	**Total 535.30 · Supplies - WW Treatment**	**13,466**	**13,538**	***5,834***	**6,581**	**12,000**	**12,000**	**0**	**0.00%**	**12,420**	**12,855**	**13,305**	**13,770**
9	535.40 · Services - WW Treatment												
10	Intergov - WW Treatment *(previously 535.5)*												
11	B&O/Excise Tax												
12	B&O Tax - Wastewater Treatment	4,861	5,276	*4,510*	6,013								
13	53 2010 · Excise Tax - Sewer	105	447	*176*	235								
14	Total B&O/Excise Tax	4,966	5,722	*4,686*	6,248	5,886	6,560	674	11.45%	6,790	7,027	7,273	7,528
15	53 3020 · Permit Fees - WW Treatment	2,077	999	*1,618*	2,718	2,201	2,854	653	29.68%	2,954	3,058	3,165	3,275
16	Total Intergov - WW Treatment	7,043	6,721	*6,304*	8,966	8,086	9,414	1,328	16.43%	9,744	10,085	10,438	10,803
17	41 3040 · WWT Operations - Contracted	0	0	*0*	0	0	0	0	0.00%	0	0	0	0
18	41 3041 · Non-Routine WWT Operations - Contracted	0	0	*0*	0	0	0	0	0.00%	0	0	0	0
19	41 3050 · Lab Testing - WW Treatment	7,859	7,559	*6,234*	8,312	7,854	8,728	874	11.12%	9,033	9,349	9,676	10,015
20	WW Treatment Maint. and Repair												
21	48 3010 · Biosolids Disposal	13,603	24,808	*5,945*	11,889	25,000	17,834	(7,166)	-28.66%	18,458	19,104	19,773	20,465
22	48 3020 · SCADA - WW Treatment	2,469	5,040	*388*	3,788	3,000	3,000	0	0.00%	3,105	3,214	3,326	3,443
23	Other	119	31,445	*15,791*	15,791	7,500	7,500	0	0.00%	7,763	8,034	8,315	8,606
24	Sewer Collection System	2,864	8,954	*3,298*	3,298	3,500	3,500	0	0.00%	3,623	3,749	3,881	4,016
25	Total WW Treatment Maint. and Repair	19,056	70,248	25,421	34,765	39,000	31,834	(7,166)	-18.37%	32,948	34,101	35,295	36,530
26	47 3010 · Electric - WW Treatment	12,378	14,628	*11,663*	15,550	15,442	16,328	886	5.73%	16,899	17,490	18,103	18,736
27	**Total 535.40 · Services - WW Treatment**	**46,420**	**99,157**	**49,621**	**67,593**	**70,382**	**66,304**	**(4,078)**	**-5.79%**	**68,624**	**71,026**	**73,512**	**76,085**
28	**Total WWT Operations Expenditures**	**$59,887**	**$112,695**	***$55,455***	**$74,174**	**$82,382**	**$78,304**	**(4,078)**	**-4.95%**	**$81,044**	**$83,881**	**$86,817**	**$89,855**

Rev. 11/22/21

Hartstene Pointe Water-Sewer District

Combined Water/Sewer, Administrative Operations Costs

		History				Budget		Difference		Projections			
		2019 Actual	2020 Actual	*2021 Jan - Sept*	2021 Projected	2021	2022	$ Change	% Change	2023	2024	2025	2026
1	Combined W/S, Administrative Operations Expenditures												
2	538.30 · Supplies - Combined W/S												
3	Tools/Equip/Supplies	4,093	9,900	*3,269*	4,359	7,000	5,000	(2,000)	-28.57%	5,175	5,356	5,544	5,738
4	Office Supplies	1,565	4,814	*825*	1,100	1,868	2,000	132	7.07%	2,070	2,142	2,217	2,295
5	**Total 538.30 · Supplies - Combined W/S**	**5,658**	**14,714**	***4,094***	**5,459**	**8,868**	**7,000**	**(1,868)**	**-21.06%**	**7,245**	**7,499**	**7,761**	**8,033**
6	538.40 · Services - Combined W/S												
8	Attorney Fees	5,472	3,184	*4,190*	4,190	4,500	4,500	0	0.00%	2,500	2,500	2,500	2,500
9	Accounting Consulting	2,869	551	*0*	0	1,500	500	(1,000)	-66.67%	518	536	554	574
10	Payroll Services	1,908	2,144	*1,615*	2,153	1,950	2,261	311	15.93%	2,340	2,422	2,506	2,594
11	Intergov *(previously 538.50)*												
12	B&O Tax - Fees/Penalties	70	48	*11*	14	70	70	0	0.00%	72	75	78	80
13	Other	71	72	*56*	56	210	210	0	0.00%	217	225	233	241
14	State Audit	6,028	845	*0*	7,000	7,000	0	(7,000)	-100.00%	6,250	0	6,500	0
15	County Election Costs	0	286	*0*	0	300	224	(76)	-25.33%	232	240	248	257
16	Total Intergov	6,170	1,251	*67*	7,070	7,580	504	(7,076)	-93.35%	522	540	559	578
17	Lockbox	733	1,032	*895*	1,194	1,258	1,253	(5)	-0.37%	1,297	1,343	1,390	1,438
18	Online Payment System	1,859	2,287	*2,017*	2,690	2,133	2,824	691	32.41%	2,923	3,025	3,131	3,241
19	IT/Software Applications	3,648	4,640	*4,285*	4,285	10,000	10,000	0	0.00%	10,500	11,025	11,576	12,155
20	Rent	840	5,840	*4,500*	6,000	6,000	12,000	6,000	100.00%	12,420	12,855	13,305	13,770
21	Merchant Service Fees	2,032	3,125	*2,964*	3,952	3,104	4,150	1,046	33.69%	4,233	4,317	4,404	4,492
22	Postage	1,815	2,742	*2,133*	2,844	2,937	2,986	49	1.69%	3,046	3,107	3,169	3,233
23	Telephone/Internet	7,299	8,060	*6,323*	8,430	7,200	7,200	0	0.00%	7,344	7,491	7,641	7,794
24	Legal Notices & Publications	0	0	*272*	272	225	225	0	0.00%	233	241	249	258
25	Liability Insurance	13,786	31,796	*1,138*	42,317	32,000	42,317	10,317	32.24%	44,433	46,654	48,987	51,437
26	Professional Dues	1,382	1,713	*246*	1,346	1,856	1,921	65	3.50%	43,798	45,331	46,918	48,560
27	Printing	1,516	1,352	*1,659*	2,213	2,000	2,323	323	16.16%	2,439	2,561	2,689	2,824
28	Other Miscellaneous Services	1,479	420	*0*	0	2,000	2,000	0	0.00%	2,070	2,142	2,217	2,295
29	Travel/Mileage/Training and Education	10,025	10,229	*8,845*	13,994	10,000	14,694	4,694	46.94%	8,000	8,280	8,570	8,870
30	**Total 538.40 · Services - Combined W/S**	**62,835**	**80,366**	**41,150**	**100,798**	**96,243**	**111,658**	**15,415**	**16.02%**	**148,615**	**154,371**	**160,366**	**166,612**
31	**Total Combined W/S, Administrative Operations**	**68,493**	**95,080**	***45,244***	**106,256**	**105,111**	**118,658**	**13,547**	**12.89%**	**155,860**	**161,869**	**168,127**	**174,645**

Rev. 11/22/21

Hartstene Pointe Water-Sewer District

Staff Costs

		History				Budget		Projections			
		2019 Actual	2020 Actual	*2021 Jan - Sept*	2021 Projected	2021	2022	2023	2024	2025	2026
1	Water Distribution Manager II - 0.5 FTE										
2	Employee Wages	42,475	24,532	*0*	0	0	60,320	0	0	0	0
3	Benefits & Payroll Tax	17,174	9,860	*0*	0	0	20,290	0	0	0	0
4	**Total WDM II Compensation**	**59,649**	**34,392**	***0***	**0**	**0**	**80,610**	**0**	**0**	**0**	**0**
5	WW Treatment Plant Operator II - 1.0 FTE										
6	Employee Wages	67,390	71,895	*30,234*	30,234	74,256	74,256	74,256	74,256	74,256	74,256
7	Benefits & Payroll Tax	16,021	21,014	*8,106*	8,106	22,077	21,635	21,635	21,635	21,635	21,635
8	**Total WWTPO II Compensation**	**83,411**	**92,909**	***38,339***	**38,339**	**96,333**	**95,891**	**95,891**	**95,891**	**95,891**	**95,891**
8	General Manager - 1.0 FTE										
9	Employee Salary	64,375	69,188	*61,438*	80,938	79,000	81,000	81,000	81,000	81,000	81,000
10	Benefits & Payroll Tax	27,364	23,897	*19,570*	26,093	30,827	30,776	30,776	30,776	30,776	30,776
11	**Total GM Compensation**	**91,739**	**93,085**	***81,007***	**107,030**	**109,827**	**111,776**	**111,776**	**111,776**	**111,776**	**111,776**
12	Project/Account Manager - 1.0 FTE										
13	Employee Wages	44,240	61,990	*50,299*	67,065	74,256	74,256	74,256	74,256	74,256	74,256
14	Benefits & Payroll Tax	16,058	18,501	*14,596*	19,461	22,077	21,635	21,635	21,635	21,635	21,635
15	**Total Compensation**	**60,297**	**80,490**	***64,895***	**86,526**	**96,333**	**95,891**	**95,891**	**95,891**	**95,891**	**95,891**
16	Apprentice/Trainee										
17	Employee Salary	0	13,760	33,343	44,457	41,600	0	0	0	0	0
18	Benefits & Payroll Tax	0	8,616	17,959	23,945	25,363	0	0	0	0	0
19	**Total T/L Compensation**	**0**	**22,376**	***51,302***	**68,403**	**66,963**	**0**	**0**	**0**	**0**	**0**
20	Commissioners										
21	Commissioner 1										
22	Per Diem	3,840	3,776	*3,264*	4,352	3,712	4,570	4,570	4,570	4,570	4,570
23	Payroll Tax	296	291	*248*	333	284	350	350	350	350	350
24	Commissioner 2										
25	Per Diem	4,408	3,719	*2,752*	3,669	4,252	3,853	3,853	3,853	3,853	3,853
26	Payroll Tax	339	286	*209*	281	325	295	295	295	295	295
27	Commissioner 3										
28	Per Diem	5,120	3,655	*3,392*	4,523	3,712	4,749	4,749	4,749	4,749	4,749
29	Payroll Tax	394	281	*258*	346	284	363	363	363	363	363
30	**Total Commissioner Compensation**	**14,397**	**12,009**	***10,123***	**13,504**	**12,569**	**14,179**	**14,179**	**14,179**	**14,179**	**14,179**
31	**Total Staff Costs**	**$309,493**	**$312,884**	***$194,364***	**$245,399**	**$382,025**	**$398,346**	**$317,736**	**$317,736**	**$317,736**	**$317,736**

Rev. 11/22/21

Hartstene Pointe Water-Sewer District

Capital Improvement Plan

			History				Budgets		Projections					
		Total Project Costs	2019 Actual	2020 Actual	*2021 Jan - Sept*	2021 Projected	2021 Budget	2022 Budget	2023	2024	2025	2026	2027	2028 - 2045
1	Water													
2	Update Water System Plan	80,000					-	-						
3	Test Pump Well #3				*3,320*	3,320	10,000	-						
4	Outfit Well # 3 and Build Dog House						-	-						
5	Install Generator Well 4	20,508	18,617	1,890			-	-						
6	Install Ferric Chloride Well 4	22,255	17,685	4,570			-	-						
7	Well 4 Fence Project	5,937	5,492	445			-	-						
8	Upgrade Water SCADA						-	50,000						
9	New Radio Read Water Meters	150,000		24,171	*54,820*	54,820	15,000	18,800						
10	Water Lateral Line Replacements (27 yrs, 20 lines/yr.)	600,000					-	-						
11	*Total Water Capital Improvements*	*907,326*	*70,420*	*31,075*	*58,140*	*58,140*	*25,000*	*68,800*	*0*	*0*	*0*	*0*	*0*	*0*
12	Wastewater Treatment/Sewer													
13	Update Sewer System Plan	80,000			*4,459*	10,000	80,000	-						
14	WWT Pumps - Rehab and Replace	0					-	10,000						
15	Upgrade WW SCADA	15,000			*19,228*	19,228	15,000	-						
16	I&I Lateral Replacements	600,000					-	-						
17	Lift Station Generators (3 total)	60,000					-	20,000	20,000	20,000				
18	*Total WWT/Sewer Capital Improvements*	*760,000*	*0*	*0*	*23,687*	*29,228*	*95,000*	*30,000*	*20,000*	*20,000*	*0*	*0*	*0*	*0*
19	Combined W/S													
20	Convert Patrol House to ADA	30,000					10,000	20,000						
21	Infrastructure Replacement	810,000					45,000	22,222	45,000	45,000	45,000	45,000	45,000	562,778
22	Lease/Rent/Purchase Mini Excavator	30,000			*29,920*	29,920	30,000	-						
23	Lease/Rent/Purchase New Work Truck	15,000					15,000	-						
24	Lease/Rent/Purchase Trailer	5,000					5,000	-						
25	Fiber Optic Connections at Wells and Reservoir	5,913	4,605	1,308			-	-						
26	*Total Combined W/S Capital Improvements*	*55,913*	*4,605*	*1,308*	*29,920*	*29,920*	*50,000*	*42,222*	*45,000*	*45,000*	*45,000*	*45,000*	*45,000*	*562,778*
27	Total Capital Improvements	$1,723,239	$75,026	$32,383	*$111,747*	$117,288	$170,000	$141,022	$65,000	$65,000	$45,000	$45,000	$45,000	$562,778
						Carry-over from Previous Year:	24,849	52,712						
						From Reservoir Repair Fund:	-	-						
						From I&I Fund:	50,000	10,000						
						From Asset Replacement Fund:	-	18,344						
						From Risk Management Fund:	80,000	20,000						
						CIP Expenditures from Existing Funds:	$ 154,849	$ 101,056	0	0	0	0	0	
						CIP Expenditures from Current Revenues:	$ 15,151	$ 39,966	$ 65,000.00	$ 65,000	$ 45,000	$ 45,000	$ 45,000	

Rev. 11/22/21

Hartstene Pointe Water-Sewer District

Loan Payments

	History					Budget		Projections			
	2019 Actual	2020 Actual	2021 Projected	2021 Actual	Actual vs. Projected	2021	2022	2023	2024	2025	2026
Ecology Loan - Effluent Outfall											
Principal Payment	33,301	33,931	34,444	34,444	0	34,444	34,964	35,492	36,028	36,572	37,125
Interest Payment	4,810	4,180	3,667	3,667	0	3,667	3,147	2,619	2,083	1,539	987
Total Ecology Loan Payments	**38,111**	**38,111**	**38,111**	**38,111**	**0**	**38,111**	**38,111**	**38,111**	**38,111**	**38,111**	**38,111**
USDA Bond - Booster Pump, Meters											
Principal Payment	27,035	27,783	28,552	28,552	0	28,552	29,343	30,155	30,991	31,849	32,731
Interest Payment	12,295	11,547	10,778	10,778	0	10,778	9,987	9,175	8,340	7,481	6,599
Total USDA Bond Payments	**39,330**	**39,330**	**39,330**	**39,330**	**0**	**39,330**	**39,330**	**39,330**	**39,330**	**39,330**	**39,330**
DWSRF Loan - Water Treatment Upgrades											
Principal Payment	65,671	65,671	65,671	65,671	0	65,671	65,671	65,671	65,671	65,671	65,671
Interest Payment	17,731	16,746	15,761	15,761	0	15,761	14,776	13,791	12,806	11,821	10,836
Total DWSRF Loan Payments	**83,402**	**82,417**	**81,432**	**81,432**	**0**	**81,432**	**80,447**	**79,462**	**78,477**	**77,492**	**76,507**
Total Loan Payments	**160,843**	**159,858**	**158,873**	**158,873**	**0**	**158,873**	**157,888**	**156,903**	**155,918**	**154,933**	**153,948**

Rev. 11/22/21

Hartstene Pointe Water-Sewer District

Net Effect of Transfers

	History				Budget		Difference		Projections			
	2019 Actual	2020 Actual	*2021 Jan - Sept*	2021 Projected	2021	2022	$ Change	% Change	2023	2024	2025	2026
Net Effect of Transfers												
030 - Ecology Loan Reserve	669	888	*34*	45	0	0	0	#DIV/0!	0	0	0	0
050 - DWSRF Loan Reserve	(107)	1,558	*(13,615)*	(59)	0	0	0	#DIV/0!	0	0	0	0
070 - USDA Revenue Bond Reserve	4,324	4,535	*685*	1,668	3,933	3,933	0	0.00%	3,933	3,933	3,933	3,933
010 - Operating Fund (incl. revolving funds)	86,537	(52,029)	*65,138*	8,753	46,288	(32,590)	(78,878)	-170.41%	(80,934)	(80,934)	(80,934)	(80,934)
020 - Committed Funds							0	0.00%				
Asset Replacement Fund	9,000	9,000	*(39,196)*	(30,196)	9,000	(9,344)	(18,344)	-203.83%	9,000	9,000	9,000	9,000
Capital Improvement Fund							0	0.00%				
Inflow & Infiltration	20,000	20,000	*(26,630)*	(3,796)	(5,000)	12,222	17,222	-344.44%	42,222	42,222	42,222	42,222
Reservoir Repair	(54,181)	0	*13,326*	13,326	13,326	13,326	0	0.00%	13,326	13,326	13,326	13,326
Other	0	0	*0*	0	0	0	0	0.00%	0	0	0	0
Risk Management Fund	44,648	16,048	*258*	10,258	(67,547)	12,453	80,000	-118.44%	12,453	12,453	12,453	12,453
Total 020 - Committed Funds	19,467	45,048	(52,241)	(10,407)	(50,221)	28,657	78,878	-157.06%	77,001	77,001	77,001	77,001
065 - Capital Projects Account	(110,891)	0	*0*	0	0	0	0	#DIV/0!	0	0	0	0

Rev. 11/22/21

Hartstene Pointe Water-Sewer District

Proposed Capital Facilities Charges

	Water	Sewer	Total
Debt Share	780	960	1,740.00
Future Improvements	620	1650	2,270.00
Assets	1690	1600	3,290.00
Total	**$3,090.00**	**$4,210.00**	**7,300.00**
Connection Fees	**$250.00**	**$250.00**	**$500.00**
Total CFC + Connection Fees	**$3,340.00**	**$4,460.00**	
Total Cost for New Connections			**$7,800.00**

Hartstene Pointe Water-Sewer District

District Funds Policies

The District shall utilize "proprietary fund accounting" as the organizational structure for its financial activities. The following funds have been established with the Mason County Treasurer's Office for budgeting and accounting purposes.

- **690-005-010 – General Operating Fund**: The General Operating Fund accounts for all financial resources and transactions, except those required to be accounted for in another fund. The minimum fund balance shall be targeted at 25% of the annual operating and maintenance budget. Projected variances from the 25% minimum target shall be disclosed during the annual budget process or during the current year if unanticipated circumstances occur that negatively impact current year revenue and/or expenditure projections. Fund balance targets may be modified during the annual budget process to reflect extraordinary circumstances (e.g., projected future extraordinary expenditure demands, projected revenue uncertainty, etc.). At least 20% of the annual operating and maintenance budget is to be invested in the State Investment Pool.
- **690-005-020 – Water/Sewer Committed Fund:** The Water/Sewer Committed Fund accounts for monies held for specified purposes but not designated for debt service. Use of monies held within this fund is subject to a vote of the District Commission. The Water/Sewer Committed Fund is divided into three sub-funds:
    - *Risk Management Fund:* For operating shortfalls due to unforeseen cost increases, unanticipated revenue losses, or unforeseen emergency expenditures. The minimum balance for this sub-fund shall be targeted at $200,000 by 2025. The sub-fund must maintain no less than 12.5% of annual operating revenue in order to meet requirements set forth in the District's DWSRF Loan contract.
    - *Capital Improvement Fund:* For the accruement of monies to fund capital projects laid out in the District's six year Capital Improvement Plan.
        - *Reservoir Fund:* For future repairs to reservoir. The target balance for this sub-fund shall be $150,000 by 2027.
    - *Asset Replacement Fund:* For the replacement of short-lived equipment. This reserve receives a $9,000 annual contribution from the General Operating Fund, per the District's USDA Bond Covenants.
- **690-005-030 – Ecology Loan Reserve:** Used to hold in reserve an amount equal to one full year of debt service payments ($38,111.40) for the District's Department of Ecology Loan. The balance of this fund is invested in the State Investment Pool.
- **690-005-050 – DWSRF Loan Reserve:** The District shall make regular transfers from the General Operating Fund into this fund such that by September 30th of each year the fund balance equals the annual DWSRF loan debt service payment. The balance of this fund is to be invested in the State Investment Pool until withdrawn for disbursement for the annual debt service payment. All interest earned on funds held within this fund shall accrue and be applied toward reducing the amount of the Drinking Water State Revolving Fund loan. ~~Based on current loan projections, the~~ For the life of the loan, monthly

transfers shall be **made to the DWSRF Loan Reserve so that the annual payment amount is accrued by October of each year, in accordance with the loan contract** ~~should be $2,000. Once the loan is closed and the actual annual payment amount is determined, the monthly transfer amount should be adjusted.~~

- **690-005-060 – Hartstene Pointe Bond Fund:** Used to make semi-annual debt service payments of $19,665. District must transfer the payment amount from the General Operating Fund into the Bond Fund at least 5 days prior to payment due dates (March 5 and September 5). The payment is electronically transferred from this fund to the USDA on the payment due date.
- **690-005-065 – Hartstene Pointe Capital Project Fund:** Used to accept construction loan funds and pay contractors for financed capital projects.
- **690-005-070 – Water Revenue Bond, 2012 Debt Service Reserve:** Used to hold one full year of USDA Bond debt service payments ($39,330). Per bond covenants, monthly transfers of $327.75 should be made from the General Operating Fund into this fund so that the balance is reached no later than September 2022. The balance of this fund is to be invested in the State Investment Pool.

For the purposes of annual financial reporting to the Washington State Auditor's Office, all funds are rolled into one general fund, designated as fund 401.

Appendix C

NPDES Permit

DEPARTMENT OF ECOLOGY
State of Washington

Issuance Date: January 16, 2018
Effective Date: January 1, 2018
Expiration Date: December 31, 2022

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) WASTE DISCHARGE PERMIT NO. WA0038377

State of Washington
DEPARTMENT OF ECOLOGY
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1342 et seq.

MDG Wastewater & Water Treatment
211 East Village View Drive
Allyn, Washington 98524

Hartstene Pointe Water – Sewer District
772 Chesapeake Drive
Shelton, Washington 98584

is authorized to discharge in accordance with the Special and General Conditions that follow.

Plant Location: Lot 48, Chesapeake Drive Hartstene Pointe, Washington Treatment Type: Sequencing Batch Reactors (SBRs), Activated Sludge, with Chlorine Disinfection	Receiving Water: Case Inlet (Puget Sound)

Richard Doenges
Southwest Region Manager
Water Quality Program
Washington State Department of Ecology

TABLE OF CONTENTS

SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions of this permit for additional submittal requirements.

Permit Section	Submittal	Frequency	First Submittal Date
S3.A.	Discharge Monitoring Report (DMR)	Monthly	February 15, 2018
S3.A.	Permit Renewal Application Monitoring Data	Annually	January 15, 2019
S3.F.	Reporting Permit Violations	As Necessary	
S4.B.	Plans for Maintaining Adequate Capacity	As Necessary	
S4.D.	Notification of New or Altered Sources	As Necessary	
S4.E.	Infiltration and Inflow Evaluation	Annually	February 15, 2018
S4.F.	Wasteload Assessment	Annually	February 15, 2018
S5.F.	Bypass Notification	As Necessary	
S6.B.4.	Notify Ecology when Industrial Users Violate Discharge Prohibitions	As Necessary	
S6.D.	Submit Copies of Industrial User Notifications Letters	As Necessary	
S8.	Application for Permit Renewal	1/Permit Cycle	June 1, 2022
S9.	Outfall Evaluation	1/Permit Cycle	November 15, 2020
G1.	Notice of Change in Authorization	As Necessary	
G4.	Reporting Planned Changes	As Necessary	
G5.	Engineering Report for Construction or Modification Activities	As Necessary	
G7.	Notice of Permit Transfer	As Necessary	
G10.	Duty to Provide Information	As Necessary	
G20.	Compliance Schedules	As Necessary	
G21.	Contract Submittal	As Necessary	

SPECIAL CONDITIONS

S1. DISCHARGE LIMITS

A. Effluent Limits

All discharges and activities authorized by this permit must comply with the terms and conditions of this permit. The discharge of any of the following pollutants more frequently than, or at a level in excess of, that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit, the Permittee may discharge treated domestic wastewater to Case Inlet at the permitted location subject to compliance with the following limits:

Effluent Limits: Outfall 001 Latitude N 47.2919 Longitude W 122.8422		
Parameter	**Average Monthly [a]**	**Average Weekly [b]**
Biochemical Oxygen Demand (5-day) (BOD_5)	30 milligrams/liter (mg/L) 41 pounds/day (lbs/day) 85% removal of influent BOD_5	45 mg/L 62 lbs/day
Total Suspended Solids (TSS)	30 mg/L 41 lbs/day 85% removal of influent TSS	45 mg/L 62 lbs/day
Total Residual Chlorine	0.5 mg/L	0.75 mg/L
Parameter	**Minimum**	**Maximum**
pH	6.0 Standard Units	9.0 Standard Units
Parameter	**Monthly Geometric Mean**	**Weekly Geometric Mean**
Fecal Coliform Bacteria [c]	200/100 milliliter (mL)	400/100 mL

a	Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, you add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured. See footnote c for fecal coliform calculations.
b	Average weekly discharge limit means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges' measured during that week. See footnote c for fecal coliform calculations.
c	The Department of Ecology (Ecology) provides directions to calculate the monthly and the weekly geometric mean in publication No. 04-10-020, Information Manual for Treatment Plant Operators available at: http://www.ecy.wa.gov/pubs/0410020.pdf

B. Mixing Zone Authorization

Mixing Zone for Outfall 001

The following paragraphs define the maximum boundaries of the mixing zones:

Chronic Mixing Zone

The mixing zone is a circle with radius of 321 feet (97.8 meters) measured from the center of each discharge port. The mixing zone extends from the bottom to the top of the water column. The concentration of pollutants at the edge of the chronic zone must meet chronic aquatic life criteria and human health criteria.

Acute Mixing Zone

The acute mixing zone is a circle with radius of 32 feet (9.8 meters) measured from the center of each discharge port. The mixing zone extends from the bottom to the top of the water column. The concentration of pollutants at the edge of the acute zone must meet acute aquatic life criteria.

Available Dilution (dilution factor)	
Acute Aquatic Life Criteria	44
Chronic Aquatic Life Criteria	478
Human Health Criteria - Carcinogen	478
Human Health Criteria - Non-carcinogen	478

S2. MONITORING REQUIREMENTS

A. Monitoring Schedule

The Permittee must monitor in accordance with the following schedule and the requirements specified in Appendix A.

Parameter	**Units & Speciation**	**Minimum Sampling Frequency**	**Sample Type**
(1) Wastewater Influent			
Wastewater Influent means the raw sewage flow from the collection system into the treatment facility. Sample the wastewater entering the headworks of the treatment plant excluding any side-stream returns from inside the plant.			
BOD_5	mg/L	Weekly	24-Hour Composite [a]
BOD_5	lbs/day	Weekly	Calculated [b]

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type
TSS	mg/L	Weekly	24-Hour Composite [a]
TSS	lbs/day	Weekly	Calculated [b]
(2) Final Wastewater Effluent			
Final Wastewater Effluent means wastewater exiting the last treatment process or operation. Typically, this is after or at the exit from the chlorine contact chamber or other disinfection process. The Permittee may take effluent samples for the BOD_5 analysis before or after the disinfection process. If taken after, the Permittee must dechlorinate and reseed the sample.			
Flow	gpd	Continuous [c]	Metered/Recorded
BOD_5	mg/L	Weekly	24-Hour Composite [a]
BOD_5	lbs/day	Weekly	Calculated [b]
BOD_5	% removal	Weekly	Calculated [d]
TSS	mg/L	Weekly	24-Hour Composite [a]
TSS	lbs/day	Weekly	Calculated [b]
TSS	% removal	Weekly	Calculated [d]
Chlorine (Total Residual) [e]	mg/L	Daily	Grab [f]
Fecal Coliform [g]	# /100 mL	2/Week	Grab [f]
pH [h]	Standard Units	Daily	Grab [f]
Total Ammonia	mg/L as N	Monthly [i]	24-Hour Composite [a]
(3) Permit Renewal Application Requirements – Final Wastewater Effluent			
Temperature [j]	Degrees Celsius	Once/July Once/December	Measurement
Dissolved Oxygen	mg/L	Annually [k]	Measurement
Total Kjeldahl Nitrogen	mg/L as N	Annually [k]	24-Hour Composite [a]
Nitrate plus Nitrite	mg/L as N	Annually [k]	24-Hour Composite [a]
Oil and Grease	mg/L	Annually [k]	Grab [f]
Phosphorus (Total)	mg/L as P	Annually [k]	24-Hour Composite [a]

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type
Total Dissolved Solids	mg/L	Annually [k]	24-Hour Composite [a]

a	Twenty-four (24)-hour composite means a series of individual samples collected over a 24-hour period into a single container, and analyzed as one sample.
b	Calculated means figured concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in MGD) X Conversion Factor (8.34) = lbs/day
c	Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes.
d	% removal = $\frac{\text{Influent concentration (mg/L)} - \text{Effluent concentration (mg/L)}}{\text{Influent concentration (mg/L)}} \times 100$ Calculate the percent (%) removal of BOD_5 and TSS using the above equation.
e	The Permittee must monitor total chlorine residual concentrations only when using chlorine for disinfection purposes.
f	Grab means an individual sample collected over a 15 minute, or less, period.
g	Report a numerical value for fecal coliforms following the procedures in Ecology's *Information Manual for Wastewater Treatment Plant Operators*, Publication Number 04-10-020 available at: http://www.ecy.wa.gov/programs/wq/permits/guidance.html. Do not report a result as Too Numerous To Count (TNTC).
h	Report the daily pH and the minimum and maximum for the monitoring period.
i	Monthly means once every calendar month during alternating weeks.
j	Temperature grab sampling must occur when the effluent is at or near its daily maximum temperature, which usually occurs in the late afternoon. If measuring temperature continuously, the Permittee must determine and report a daily maximum from half-hour measurements in a 24-hour period. Continuous monitoring instruments must achieve an accuracy of 0.2 degrees C and the Permittee must verify accuracy annually.
k	Annually is defined as January – December **starting January 1, 2018.**

B. Sampling and Analytical Procedures

Samples and measurements taken to meet the requirements of this permit must represent the volume and nature of the monitored parameters. The Permittee must conduct representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions that may affect effluent quality.

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 Code of Federal Regulations (CFR) Part 136 [or as applicable in 40 CFR subchapters N (Parts 400–471) or O (Parts 501-503)] unless otherwise specified in this permit. The Department of Ecology (Ecology) may only specify alternative methods for parameters without permit limits and for those parameters without an Environmental Protection Agency (EPA) approved test method in 40 CFR Part 136.

C. Flow Measurement, Field Measurement, and Continuous Monitoring Devices

The Permittee must:

1. Select and use appropriate flow measurement, field measurement, and continuous monitoring devices and methods consistent with accepted scientific practices.

2. Install, calibrate, and maintain these devices to ensure the accuracy of the measurements is consistent with the accepted industry standard, the manufacturer's recommendation, and approved Operation and Maintenance (O&M) Manual procedures for the device and the wastestream.

3. Calibrate continuous monitoring instruments weekly unless it can demonstrate a longer period is sufficient based on monitoring records. The Permittee:

    a. May calibrate apparatus for continuous monitoring of dissolved oxygen by air calibration.

    b. Must calibrate continuous pH measurement instruments using a grab sample analyzed in the lab with a pH meter calibrated with standard buffers and analyzed within 15 minutes of sampling.

    c. Must calibrate continuous chlorine measurement instruments using a grab sample analyzed in the laboratory within 15 minutes of sampling.

4. Use field measurement devices as directed by the manufacturer and do not use reagents beyond their expiration dates.

5. Establish a calibration frequency for each device or instrument in the O&M Manual that conforms to the frequency recommended by the manufacturer.

6. Maintain calibration records for at least three years.

D. Laboratory Accreditation

The Permittee must ensure that all monitoring data required by Ecology for permit specified parameters is prepared by a laboratory registered or accredited under the provisions of chapter 173-50 Washington Administrative Code (WAC), *Accreditation of Environmental Laboratories*. Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from this requirement.

S3. REPORTING AND RECORDING REQUIREMENTS

The Permittee must monitor and report in accordance with the following conditions. Falsification of information submitted to Ecology is a violation of the terms and conditions of this permit.

A. Discharge Monitoring Reports

The first monitoring period begins on the effective date of the permit (unless otherwise specified). The Permittee must:

1. Summarize, report, and submit monitoring data obtained during each monitoring period on the electronic Discharge Monitoring Report (DMR) form provided by Ecology within the Water Quality Permitting Portal. Include data for each of the parameters tabulated in Special Condition S2 and as required by the form. Report a value for each day sampling occurred (unless specifically exempted in the permit) and for the summary values (when applicable) included on the electronic form.

   To find out more information and to sign up for the Water Quality Permitting Portal go to: http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html.

2. Enter the "No Discharge" reporting code for an entire DMR, for a specific monitoring point, or for a specific parameter as appropriate, if the Permittee did not discharge wastewater or a specific pollutant during a given monitoring period.

3. Report single analytical values below detection as "less than the Detection Level (DL)" by entering < followed by the numeric value of the detection level (e.g. < 2.0) on the DMR. If the method used did not meet the minimum DL and Quantitation Level (QL) identified in the permit, report the actual QL and DL in the comments or in the location provided.

4. **Do not** report zero for bacteria monitoring. Report as required by the laboratory method.

5. Calculate and report an arithmetic average value for each day for bacteria if multiple samples were taken in one day.

6. Calculate the geometric mean values for bacteria (unless otherwise specified in the permit) using:

   a. The reported numeric value for all bacteria samples measured above the detection value except when multiple samples were taken in one day. If the Permittee takes multiple samples in one day it must use the arithmetic average for the day in the geometric mean calculation.

   b. The detection value for those samples measured below detection.

7. Report the test method used for analysis in the comments if the laboratory used an alternative method not specified in the permit and as allowed in Appendix A.

8. Calculate average values and calculated total values (unless otherwise specified in the permit) using:

   a. The reported numeric value for all parameters measured between the agency-required detection value and the agency-required quantitation value.

   b. One-half the detection value (for values reported below detection) if the lab detected the parameter in another sample from the same monitoring point for the reporting period.

   c. Zero (for values reported below detection) if the lab did not detect the parameter in another sample for the reporting period.

9. Report single-sample grouped parameters (for example: priority pollutants, PAHs, pulp and paper chlorophenolics, TTOs) on the WQWebDMR form and include: sample date, concentration detected, DL (as necessary), and laboratory QL (as necessary).

   The Permittee must also submit an electronic copy of the laboratory report as an attachment using WQWebDMR. The contract laboratory reports must also include information on the chain of custody, QA/QC results, and documentation of accreditation for the parameter.

10. Ensure that DMRs are electronically submitted no later than the dates specified below, unless otherwise specified in this permit.

11. Submit DMRs for parameters with the monitoring frequencies specified in S2 (monthly, quarterly, annual, etc.) at the reporting schedule identified below. The Permittee must:

    a. Submit **monthly** DMRs by the 15th day of the following month.

    b. Submit permit renewal application monitoring data in WQWebDMR as required in Special Condition S2.

B. Permit Submittals and Schedules

The Permittee may use the Water Quality Permitting Portal – Permit Submittals application (unless otherwise specified in the permit) to submit all other written permit-required reports by the date specified in the permit.

When another permit condition requires submittal of a paper (hard-copy) report, the Permittee must ensure that it is postmarked or received by Ecology no later than the dates specified by this permit. Send these paper reports to Ecology at:

Water Quality Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

C. Records Retention

The Permittee must retain records of all monitoring information for a minimum of three years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

D. Recording of Results

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.

2. The individual who performed the sampling or measurement.

3. The dates the analyses were performed.

4. The individual who performed the analyses.

5. The analytical techniques or methods used.

6. The results of all analyses.

E. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by Special Condition S2 of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's DMR unless otherwise specified by Special Condition S2.

F. Reporting Permit Violations

The Permittee must take the following actions when it violates or is unable to comply with any permit condition:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance and correct the problem.

2. If applicable, immediately repeat sampling and analysis. Submit the results of any repeat sampling to Ecology within 30 days of sampling.

   a. Immediate Reporting

      The Permittee must immediately report to Ecology and the Department of Health, Shellfish Program, and the Local Health Jurisdiction (at the numbers listed below), all:

- Failures of the disinfection system.
- Collection system overflows.
- Plant bypasses discharging to marine surface waters.
- Any other failures of the sewage system (pipe breaks, etc.)

Southwest Regional Office	360-407-6300
Department of Health, Shellfish Program	360-236-3330 (business hours) 360-789-8962 (after business hours)
Mason County Public Health	360-427-9670

b. Twenty-Four-Hour Reporting

The Permittee must report the following occurrences of noncompliance by telephone, to Ecology at the telephone numbers listed above, within 24 hours from the time the Permittee becomes aware of any of the following circumstances:

i. Any noncompliance that may endanger health or the environment, unless previously reported under immediate reporting requirements.

ii. Any unanticipated bypass that causes an exceedance of an effluent limit in the permit (See Part S5.F, "Bypass Procedures").

iii. Any upset that causes an exceedance of an effluent limit in the permit (See G.15, "Upset").

iv. Any violation of a maximum daily or instantaneous maximum discharge limit for any of the pollutants in Section S1.A of this permit.

v. Any overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limit in the permit.

c. Report Within Five Days

The Permittee must also submit a written report within five days of the time that the Permittee becomes aware of any reportable event under subparts a or b, above. The report must contain:

i. A description of the noncompliance and its cause.

ii. The period of noncompliance, including exact dates and times.

iii. The estimated time the Permittee expects the noncompliance to continue if not yet corrected.

iv. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

v. If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.

d. Waiver of Written Reports

Ecology may waive the written report required in subpart c, above, on a case-by-case basis upon request if the Permittee has submitted a timely oral report.

e. All Other Permit Violation Reporting

The Permittee must report all permit violations, which do not require immediate or within 24 hours reporting, when it submits monitoring reports for S3.A ("Reporting"). The reports must contain the information listed in subpart c, above. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

G. Other Reporting

1. Spills of Oil or Hazardous Materials

The Permittee must report a spill of oil or hazardous materials in accordance with the requirements of Revised Code of Washington (RCW) 90.56.280 and chapter 173-303-145. You can obtain further instructions at the following website: http://www.ecy.wa.gov/programs/spills/other/reportaspill.htm.

2. Failure to Submit Relevant or Correct Facts

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to Ecology, it must submit such facts or information promptly.

H. Maintaining a Copy of this Permit

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S4. FACILITY LOADING

A. Design Criteria

The flows or waste loads for the permitted facility must not exceed the following design criteria:

Maximum Month Design Flow (MMDF)	186,000 gpd
Peak Daily Design Flow	342,000 gpd
BOD_5 Influent Loading for Maximum Month	270 lbs/day
TSS Influent Loading for Maximum Month	270 lbs/day

B. Plans for Maintaining Adequate Capacity

1. Conditions Triggering Plan Submittal

The Permittee must submit a plan and a schedule for continuing to maintain capacity to Ecology when:

a. The actual flow or waste load reaches 85 percent of any one of the design criteria in S4.A for three consecutive months.

b. The projected plant flow or loading would reach design capacity within five years.

2. Plan and Schedule Content

The plan and schedule must identify the actions necessary to maintain adequate capacity for the expected population growth and to meet the limits and requirements of the permit. The Permittee must consider the following topics and actions in its plan.

a. Analysis of the present design and proposed process modifications

b. Reduction or elimination of excessive infiltration and inflow of uncontaminated ground and surface water into the sewer system

c. Limits on future sewer extensions or connections or additional waste loads

d. Modification or expansion of facilities

e. Reduction of industrial or commercial flows or wasteloads

Engineering documents associated with the plan must meet the requirements of WAC 173-240-060, "Engineering Report," and be approved by Ecology prior to any construction.

C. Duty to Mitigate

The Permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

D. Notification of New or Altered Sources

1. The Permittee must submit written notice to Ecology whenever any new discharge or a substantial change in volume or character of an existing discharge into the wastewater treatment plant is proposed which:

   a. Would interfere with the operation of, or exceed the design capacity of, any portion of the wastewater treatment plant.

   b. Is not part of an approved general sewer plan or approved plans and specifications.

   c. Is subject to pretreatment standards under 40 CFR Part 403 and Section 307(b) of the Clean Water Act.

2. This notice must include an evaluation of the wastewater treatment plant's ability to adequately transport and treat the added flow and/or waste load, the quality and volume of effluent to be discharged to the treatment plant, and the anticipated impact on the Permittee's effluent [40 CFR 122.42(b)].

E. Infiltration and Inflow Evaluation

1. The Permittee must conduct an infiltration and inflow evaluation. Refer to the U.S. EPA publication, I/I Analysis and Project Certification, available as Publication No. 97-03 at: http://www.ecy.wa.gov/programs/wq/permits/guidance.html.

2. The Permittee may use monitoring records to assess measurable infiltration and inflow.

3. The Permittee must prepare a report summarizing any measurable infiltration and inflow. If infiltration and inflow have increased by more than 15 percent from that found in the previous report based on equivalent rainfall, the report must contain a plan and a schedule to locate the sources of infiltration and inflow and to correct the problem.

4. The Permittee must submit a report summarizing the results of the evaluation and any recommendations for corrective actions by **February 15, 2018**, and **annually** thereafter.

F. Wasteload Assessment

The Permittee must conduct an annual assessment of its influent flow and waste load and submit a report to Ecology by **February 15, 2018**, and **annually** thereafter. The report must contain:

1. A description of compliance or noncompliance with the permit effluent limits.

2. A comparison between the existing and design:

   a. Monthly average dry weather and wet weather flows

   b. Peak flows

   c. BOD_5 loading

   d. Total Suspended Solids loadings

3. The percent change in the above parameters since the previous report (except for the first report).

4. The present and design population or population equivalent.

5. The projected population growth rate.

6. The estimated date upon which the Permittee expects the wastewater treatment plant to reach design capacity, according to the most restrictive of the parameters above.

Ecology may modify the interval for review and reporting if it determines that a different frequency is sufficient.

S5. OPERATION AND MAINTENANCE

The Permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes keeping a daily operation logbook (paper or electronic), adequate laboratory controls, and appropriate quality assurance procedures. This provision of the permit requires the Permittee to operate backup or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this permit.

A. Certified Operator

This permitted facility must be operated by an operator certified by the state of Washington for at least a Class II plant. This operator must be in responsible charge of the day-to-day operation of the wastewater treatment plant. An operator certified for at least a Class I plant must be in charge during all regularly scheduled shifts. The Permittee must notify Ecology when the operator in charge at the facility changes. It must provide the new operator's name and certification level and provide the name of the operator leaving the facility.

B. Operation and Maintenance Program

The Permittee must:

1. Institute an adequate operation and maintenance program for the entire sewage system.

2. Keep maintenance records on all major electrical and mechanical components of the treatment plant, as well as the sewage system and pumping stations. Such records must clearly specify the frequency and type of maintenance recommended by the manufacturer and must show the frequency and type of maintenance performed.

3. Make maintenance records available for inspection at all times.

C. Short-Term Reduction

The Permittee must schedule any facility maintenance, which might require interruption of wastewater treatment and degrade effluent quality, during non-critical water quality periods and carry this maintenance out according to the approved O&M Manual or as otherwise approved by Ecology.

If a Permittee contemplates a reduction in the level of treatment that would cause a violation of permit discharge limits on a short-term basis for any reason, and such reduction cannot be avoided, the Permittee must:

1. Give written notification to Ecology, if possible, 30 days prior to such activities.

2. Detail the reasons for, length of time of, and the potential effects of the reduced level of treatment.

This notification does not relieve the Permittee of its obligations under this permit.

D. Electrical Power Failure

The Permittee must ensure that adequate safeguards prevent the discharge of untreated wastes or wastes not treated in accordance with the requirements of this permit during electrical power failure at the treatment plant and/or sewage lift stations. Adequate safeguards include, but are not limited to, alternate power sources, standby generator(s), or retention of inadequately treated wastes.

The Permittee must maintain Reliability Class I (EPA 430-99-74-001) at the wastewater treatment plant. Reliability Class I requires a backup power source sufficient to operate all vital components and critical lighting and ventilation during peak wastewater flow conditions.

E. Prevent Connection of Inflow

The Permittee must strictly enforce its sewer ordinances and not allow the connection of inflow (roof drains, foundation drains, etc.) to the sanitary sewer system.

F. Bypass Procedures

This permit prohibits a bypass, which is the intentional diversion of waste streams from any portion of a treatment facility. Ecology may take enforcement action against a Permittee for a bypass unless one of the following circumstances (1, 2, or 3) applies.

1. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

   This permit authorizes a bypass if it allows for essential maintenance and does not have the potential to cause violations of limits or other conditions of this permit, or adversely impact public health as determined by Ecology prior to the bypass. The Permittee must submit prior notice, if possible, at least 10 days before the date of the bypass.

2. Bypass which is unavoidable, unanticipated, and results in noncompliance of this permit.

   This permit authorizes such a bypass only if:

   a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

   b. No feasible alternatives to the bypass exist, such as:

      - The use of auxiliary treatment facilities.
      - Retention of untreated wastes.
      - Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass.
      - Transport of untreated wastes to another treatment facility.

   c. Ecology is properly notified of the bypass as required in Special Condition S3.F of this permit.

3. If bypass is anticipated and has the potential to result in noncompliance of this permit.

   a. The Permittee must notify Ecology at least 30 days before the planned date of bypass. The notice must contain:

      - A description of the bypass and its cause.

- An analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.
- A cost-effectiveness analysis of alternatives including comparative resource damage assessment.
- The minimum and maximum duration of bypass under each alternative.
- A recommendation as to the preferred alternative for conducting the bypass.
- The projected date of bypass initiation.
- A statement of compliance with State Environmental Policy Act (SEPA).
- A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.
- Details of the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

b. For probable construction bypasses, the Permittee must notify Ecology of the need to bypass as early in the planning process as possible. The Permittee must consider the analysis required above during the project planning and design process. The project-specific engineering report or facilities plan as well as the plans and specifications must include details of probable construction bypasses to the extent practical. In cases where the Permittee determines the probable need to bypass early, the Permittee must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.

c. Ecology will consider the following prior to issuing an administrative order for this type of bypass:

- If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.
- If feasible alternatives to bypass exist, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.
- If the Permittee planned and scheduled the bypass to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve or deny the request. Ecology

will give the public an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Ecology will approve a request to bypass by issuing an administrative order under RCW 90.48.120.

G. Operations and Maintenance (O&M) Manual

1. O&M Manual Submittal and Requirements

The Permittee must:

a. Review the O&M Manual at least annually.

b. Submit to Ecology for review and approval substantial changes or updates to the O&M Manual whenever it incorporates them into the manual.

c. Keep the approved O&M Manual at the permitted facility.

d. Follow the instructions and procedures of this manual.

2. O&M Manual Components

In addition to the requirements of WAC 173-240-080(1) through (5), the O&M Manual must be consistent with the guidance in Table G1-3 in the *Criteria for Sewage Works Design* (Orange Book), 2008. The O&M Manual must include:

a. Emergency procedures for cleanup in the event of wastewater system upset or failure.

b. A review of system components which if failed could pollute surface water or could impact human health. Provide a procedure for a routine schedule of checking the function of these components.

c. Wastewater system maintenance procedures that contribute to the generation of process wastewater.

d. Reporting protocols for submitting reports to Ecology to comply with the reporting requirements in the discharge permit.

e. Any directions to maintenance staff when cleaning or maintaining other equipment or performing other tasks which are necessary to protect the operation of the wastewater system (for example, defining maximum allowable discharge rate for draining a tank, blocking all floor drains before beginning the overhaul of a stationary engine).

f. The treatment plant process control monitoring schedule.

g. Minimum staffing adequate to operate and maintain the treatment processes and carry out compliance monitoring required by the permit.

S6. PRETREATMENT

A. General Requirements

The Permittee must work with Ecology to ensure that all commercial and industrial users of the Publicly Owned Treatment Works (POTW) comply with the pretreatment regulations in 40 CFR Part 403 and any additional regulations that the EPA may promulgate under Section 307(b) (pretreatment) and 308 (reporting) of the Federal Clean Water Act.

B. Duty to Enforce Discharge Prohibitions

1. Under federal regulations [40 CFR 403.5(a) and (b)], the Permittee must not authorize or knowingly allow the discharge of any pollutants into its POTW which may be reasonably expected to cause pass through or interference, or which otherwise violate general or specific discharge prohibitions contained in 40 CFR Part 403.5 or WAC 173-216-060.

2. The Permittee must not authorize or knowingly allow the introduction of any of the following into their treatment works:

   a. Pollutants which create a fire or explosion hazard in the POTW (including, but not limited to waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21).

   b. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, or greater than 11.0 standard units, unless the works are specifically designed to accommodate such discharges.

   c. Solid or viscous pollutants in amounts that could cause obstruction to the flow in sewers or otherwise interfere with the operation of the POTW.

   d. Any pollutant, including oxygen-demanding pollutants, (BOD_5, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

   e. Petroleum oil, non-biodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass through.

   f. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity which may cause acute worker health and safety problems.

   g. Heat in amounts that will inhibit biological activity in the POTW resulting in interference but in no case heat in such quantities such that the temperature at the POTW headworks exceeds 40 degrees Centigrade (104 degrees Fahrenheit) unless Ecology, upon request of the Permittee, approves, in writing, alternate temperature limits.

h. Any trucked or hauled pollutants, except at discharge points designated by the Permittee.

i. Wastewaters prohibited to be discharged to the POTW by the Dangerous Waste Regulations (chapter 173-303 WAC), unless authorized under the Domestic Sewage Exclusion (WAC 173-303-071).

3. The Permittee must also not allow the following discharges to the POTW unless approved in writing by Ecology:

a. Noncontact cooling water in significant volumes.

b. Stormwater and other direct inflow sources.

c. Wastewaters significantly affecting system hydraulic loading, which do not require treatment, or would not be afforded a significant degree of treatment by the system.

4. The Permittee must notify Ecology if any industrial user violates the prohibitions listed in this section (S6.B), and initiate enforcement action to promptly curtail any such discharge.

C. Wastewater Discharge Permit Required

The Permittee must:

1. Establish a process for authorizing non-domestic wastewater discharges that ensures all SIUs in all tributary areas meet the applicable State Waste Discharge Permit (SWDP) requirements in accordance with chapter 90.48 RCW and chapter 173-216 WAC.

2. Immediately notify Ecology of any proposed discharge of wastewater from a source, which may be a significant industrial user (SIU) [see fact sheet definitions or refer to 40 CFR 403.3(v)(i)(ii)].

3. Require all SIUs to obtain a SWDP from Ecology prior to accepting their non-domestic wastewater, or require proof that Ecology has determined they do not require a permit.

4. Require the documentation as described in S6.C.3 at the earliest practicable date as a condition of continuing to accept non-domestic wastewater discharges from a previously undiscovered, currently discharging and unpermitted SIU.

5. Require sources of non-domestic wastewater, which do not qualify as SIUs but merit a degree of oversight, to apply for a SWDP and provide it a copy of the application and any Ecology responses.

6. Keep all records documenting that its users have met the requirements of S6.C.

D. Identification and Reporting of Existing, New, and Proposed Industrial Users

1. The Permittee must take continuous, routine measures to identify all existing, new, and proposed SIUs and Potential Significant Industrial Users (PSIUs) discharging or proposing to discharge to the Permittee's sewer system (see **Appendix C** of the fact sheet for definitions).

2. Within 30 days of becoming aware of an unpermitted existing, new, or proposed industrial user who may be a Significant Industrial User (SIU), the Permittee must notify such user by registered mail that, if classified as an SIU, they must apply to Ecology and obtain a State Waste Discharge Permit. The Permittee must send a copy of this notification letter to Ecology within this same 30-day period.

3. The Permittee must also notify all Potential SIUs (PSIUs), as they are identified, that if their classification should change to an SIU, they must apply to Ecology for a State Waste Discharge Permit within 30 days of such change.

S7. SOLID WASTES

A. Solid Waste Handling

The Permittee must handle and dispose of all solid waste material in such a manner as to prevent its entry into state ground or surface water.

B. Leachate

The Permittee must not allow leachate from its solid waste material to enter state waters without providing all known, available, and reasonable methods of treatment, nor allow such leachate to cause violations of the State Surface Water Quality Standards, Chapter 173-201A WAC, or the State Ground Water Quality Standards, Chapter 173-200 WAC. The Permittee must apply for a permit or permit modification as may be required for such discharges to state ground or surface waters.

S8. APPLICATION FOR PERMIT RENEWAL OR MODIFICATION FOR FACILITY CHANGES

The Permittee must submit an application for renewal of this permit by **June 1, 2022**.

The Permittee must also submit a new application or addendum at least 180 days prior to commencement of discharges, resulting from the activities listed below, which may result in permit violations. These activities include any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility.

S9. OUTFALL EVALUATION

The Permittee must inspect, once per permit term, the submerged portion of the outfall line and diffuser to document its integrity and continued function. If conditions allow for a photographic verification, the Permittee must include such verification in the report. By **November 15, 2020**, the Permittee must submit the inspection report to Ecology through the Water Quality Permitting Portal – Permit Submittals application. The Permittee must submit hard-copies of any video files to Ecology as required by Permit Condition S3.B. The Portal does not support submittal of video files.

The inspector must at minimum:

- Assess the physical condition of the outfall pipe, diffuser, and associated couplings.
- Determine the extent of sediment accumulation in the vicinity of the diffuser.
- Ensure diffuser ports are free of obstructions and are allowing uniform flow.
- Confirm physical location (latitude/longitude) and depth (at MLLW) of the diffuser section of the outfall.
- Assess physical condition of the submarine line.
- Assess physical condition of anchors used to secure the submarine line.

GENERAL CONDITIONS

G1. SIGNATORY REQUIREMENTS

A. All applications, reports, or information submitted to Ecology must be signed and certified.

1. In the case of corporations, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation; or

- The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. In the case of a partnership, by a general partner.

3. In the case of sole proprietorship, by the proprietor.

4. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

Applications for permits for domestic wastewater facilities that are either owned or operated by, or under contract to, a public entity shall be submitted by the public entity.

B. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to Ecology.

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

C. Changes to authorization. If an authorization under paragraph G1.B, above, is no longer accurate because a different individual or position has responsibility for the overall

operation of the facility, a new authorization satisfying the requirements of paragraph G1.B, above, must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this section must make the following certification:

> "I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G2. RIGHT OF INSPECTION AND ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

A. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit.

B. To have access to and copy, at reasonable times and at reasonable cost, any records required to be kept under the terms and conditions of this permit.

C. To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.

D. To sample or monitor, at reasonable times, any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G3. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the Permittee) or upon Ecology's initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR 122.62, 40 CFR 122.64 or WAC 173-220-150 according to the procedures of 40 CFR 124.5.

A. The following are causes for terminating this permit during its term, or for denying a permit renewal application:

1. Violation of any permit term or condition.

2. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.

3. A material change in quantity or type of waste disposal.

4. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination.

5. A change in any condition that requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit.

6. Nonpayment of fees assessed pursuant to RCW 90.48.465.

7. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

B. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:

1. A material change in the condition of the waters of the state.

2. New information not available at the time of permit issuance that would have justified the application of different permit conditions.

3. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.

4. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.

5. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.

6. Ecology has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.

7. Incorporation of an approved local pretreatment program into a municipality's permit.

C. The following are causes for modification or alternatively revocation and reissuance:

1. When cause exists for termination for reasons listed in A.1 through A.7 of this section, and Ecology determines that modification or revocation and reissuance is appropriate.

2. When Ecology has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition G7) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new Permittee.

G4. REPORTING PLANNED CHANGES

The Permittee must, as soon as possible, but no later than 180 days prior to the proposed changes, give notice to Ecology of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in:

A. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).

B. A significant change in the nature or an increase in quantity of pollutants discharged.

C. A significant change in the Permittee's sludge use or disposal practices. Following such notice, and the submittal of a new application or supplement to the existing application, along with required engineering plans and reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G5. PLAN REVIEW REQUIRED

Prior to constructing or modifying any wastewater control facilities, an engineering report and detailed plans and specifications must be submitted to Ecology for approval in accordance with chapter 173-240 WAC. Engineering reports, plans, and specifications must be submitted at least 180 days prior to the planned start of construction unless a shorter time is approved by Ecology. Facilities must be constructed and operated in accordance with the approved plans.

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit excuses the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. TRANSFER OF THIS PERMIT

In the event of any change in control or ownership of facilities from which the authorized discharge emanate, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, a copy of which must be forwarded to Ecology.

1. Transfers by Modification

Except as provided in paragraph (2) below, this permit may be transferred by the Permittee to a new owner or operator only if this permit has been modified or revoked and reissued under 40 CFR 122.62(b)(2), or a minor modification made under 40 CFR 122.63(d), to identify the new Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

2. Automatic Transfers

This permit may be automatically transferred to a new Permittee if:

a. The Permittee notifies Ecology at least 30 days in advance of the proposed transfer date.

b. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.

c. Ecology does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this

subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

G8. REDUCED PRODUCTION FOR COMPLIANCE

The Permittee, in order to maintain compliance with its permit, must control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G9. REMOVED SUBSTANCES

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must not be resuspended or reintroduced to the final effluent stream for discharge to state waters.

G10. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology upon request, copies of records required to be kept by this permit.

G11. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G12. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G13. PAYMENT OF FEES

The Permittee must submit payment of fees associated with this permit as assessed by Ecology.

G14. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to $10,000 and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit may incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to $10,000 for every such violation. Each and every such violation is a separate and distinct offense, and in case of a continuing violation, every day's continuance is deemed to be a separate and distinct violation.

G15. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limits if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

A. An upset occurred and that the permittee can identify the cause(s) of the upset.

B. The permitted facility was being properly operated at the time of the upset.

C. The Permittee submitted notice of the upset as required in Special Condition s3.f.

D. The Permittee complied with any remedial measures required under S3.f of this permit.

In any enforcement action the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or by both.

G20. COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

G21. SERVICE AGREEMENT REVIEW

The Permittee must submit to Ecology any proposed service agreements and proposed revisions or updates to existing agreements for the operation of any wastewater treatment facility covered by this permit. The review is to ensure consistency with chapters 90.46 and 90.48 RCW as required by RCW 70.150.040(9). In the event that Ecology does not comment within a 30-day period, the Permittee may assume consistency and proceed with the service agreement or the revised/updated service agreement.

APPENDIX A

LIST OF POLLUTANTS WITH ANALYTICAL METHODS, DETECTION LIMITS AND QUANTITATION LEVELS

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for permit and application required monitoring unless:

- Another permit condition specifies other methods, detection levels, or quantitation levels.
-
- The method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136.

If the Permittee uses an alternative method, not specified in the permit and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

If the Permittee is unable to obtain the required DL and QL in its effluent due to matrix effects, the Permittee must submit a matrix-specific detection limit (MDL) and a quantitation limit (QL) to Ecology with appropriate laboratory documentation.

When the permit requires the Permittee to measure the base neutral compounds in the list of priority pollutants, it must measure all of the base neutral pollutants listed in the table below. The list includes EPA required base neutral priority pollutants and several additional polynuclear aromatic hydrocarbons (PAHs). The Water Quality Program added several PAHs to the list of base neutrals below from Ecology's Persistent Bioaccumulative Toxics (PBT) List. It only added those PBT parameters of interest to Appendix A that did not increase the overall cost of analysis unreasonably.

Ecology added this appendix to the permit in order to reduce the number of analytical "non-detects" in permit-required monitoring and to measure effluent concentrations near or below criteria values where possible at a reasonable cost.

The lists below include conventional pollutants (as defined in CWA section 502(6) and 40 CFR Part 122.), toxic or priority pollutants as defined in CWA section 307(a)(1) and listed in 40 CFR Part 122 Appendix D, 40 CFR Part 401.15 and 40 CFR Part 423 Appendix A), and nonconventionals. 40 CFR Part 122 Appendix D (Table V) also identifies toxic pollutants and hazardous substances which are required to be reported by dischargers if expected to be present. This permit appendix A list does not include those parameters.

CONVENTIONAL POLLUTANTS				
Pollutant	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1] *µg/L unless specified***	**Quantitation Level (QL) [2] *µg/L unless specified***
Biochemical Oxygen Demand		SM5210-B		2 mg/L
Biochemical Oxygen Demand, Soluble		SM5210-B [3]		2 mg/L
Fecal Coliform		SM 9221E,9222	N/A	Specified in method - sample aliquot dependent
Oil and Grease (HEM) (Hexane Extractable Material)		1664 A or B	1,400	5,000
pH		SM4500-H^+ B	N/A	N/A
Total Suspended Solids		SM2540-D		5 mg/L

NONCONVENTIONAL POLLUTANTS				
Pollutant & CAS No. (if available)	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1] µg/L unless specified**	**Quantitation Level (QL)[2] µg/L unless specified**
Alkalinity, Total		SM2320-B		5 mg/L as CaCO3
Aluminum, Total	7429-90-5	200.8	2.0	10
Ammonia, Total (as N)		SM4500-NH3-B and C/D/E/G/H		20
Barium Total	7440-39-3	200.8	0.5	2.0
BTEX (benzene +toluene + ethylbenzene + m,o,p xylenes)		EPA SW 846 8021/8260	1	2
Boron, Total	7440-42-8	200.8	2.0	10.0

NONCONVENTIONAL POLLUTANTS				
Pollutant & CAS No. (if available)	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1] µg/L unless specified**	**Quantitation Level (QL)[2] µg/L unless specified**
Chemical Oxygen Demand		SM5220-D		10 mg/L
Chloride		SM4500-Cl B/C/D/E and SM4110 B		Sample and limit dependent
Chlorine, Total Residual		SM4500 Cl G		50.0
Cobalt, Total	7440-48-4	200.8	0.05	0.25
Color		SM2120 B/C/E		10 color units
Dissolved oxygen		SM4500-OC/OG		0.2 mg/L
Flow		Calibrated device		
Fluoride	16984-48-8	SM4500-F E	25	100
Hardness, Total		SM2340B		200 as CaCO3
Iron, Total	7439-89-6	200.7	12.5	50
Magnesium, Total	7439-95-4	200.7	10	50
Manganese, Total	7439-96-5	200.8	0.1	0.5
Molybdenum, Total	7439-98-7	200.8	0.1	0.5
Nitrate + Nitrite Nitrogen (as N)		SM4500-NO3-E/F/H		100
Nitrogen, Total Kjeldahl (as N)		SM4500-N_{org}B/C and SM4500NH_3-B/C/D/EF/G/H		300
NWTPH Dx [4]		Ecology NWTPH Dx	250	250
NWTPH Gx [5]		Ecology NWTPH Gx	250	250

NONCONVENTIONAL POLLUTANTS				
Pollutant & CAS No. (if available)	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1] µg/L unless specified**	**Quantitation Level (QL)[2] µg/L unless specified**
Phosphorus, Total (as P)		SM 4500 PB followed by SM4500-PE/PF	3	10
Salinity		SM2520-B		3 practical salinity units or scale (PSU or PSS)
Settleable Solids		SM2540 -F		Sample and limit dependent
Soluble Reactive Phosphorus (as P)		SM4500-P E/F/G	3	10
Sulfate (as mg/L SO_4)		SM4110-B		0.2 mg/L
Sulfide (as mg/L S)		SM4500-S^2F/D/E/G		0.2 mg/L
Sulfite (as mg/L SO_3)		SM4500-SO3B		2 mg/L
Temperature (max. 7-day avg.)		Analog recorder or Use micro-recording devices known as thermistors		0.2º C
Tin, Total	7440-31-5	200.8	0.3	1.5
Titanium, Total	7440-32-6	200.8	0.5	2.5
Total Coliform		SM 9221B, 9222B, 9223B	N/A	Specified in method - sample aliquot dependent
Total Organic Carbon		SM5310-B/C/D		1 mg/L
Total dissolved solids		SM2540 C		20 mg/L

PRIORITY POLLUTANTS	**PP #**	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
METALS, CYANIDE & TOTAL PHENOLS					
Antimony, Total	114	7440-36-0	200.8	0.3	1.0
Arsenic, Total	115	7440-38-2	200.8	0.1	0.5
Beryllium, Total	117	7440-41-7	200.8	0.1	0.5
Cadmium, Total	118	7440-43-9	200.8	0.05	0.25
Chromium (hex) dissolved	119	18540-29-9	SM3500-Cr C	0.3	1.2
Chromium, Total	119	7440-47-3	200.8	0.2	1.0
Copper, Total	120	7440-50-8	200.8	0.4	2.0
Lead, Total	122	7439-92-1	200.8	0.1	0.5
Mercury, Total	123	7439-97-6	1631E	0.0002	0.0005
Nickel, Total	124	7440-02-0	200.8	0.1	0.5
Selenium, Total	125	7782-49-2	200.8	1.0	1.0
Silver, Total	126	7440-22-4	200.8	0.04	0.2
Thallium, Total	127	7440-28-0	200.8	0.09	0.36
Zinc, Total	128	7440-66-6	200.8	0.5	2.5
Cyanide, Total	121	57-12-5	335.4	5	10
Cyanide, Weak Acid Dissociable	121		SM4500-CN I	5	10
Cyanide, Free Amenable to Chlorination (Available Cyanide)	121		SM4500-CN G	5	10
Phenols, Total	65		EPA 420.1		50

PRIORITY POLLUTANTS	**PP #**	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL) [2]** ***µg/L unless specified***
ACID COMPOUNDS					
2-Chlorophenol	24	95-57-8	625	1.0	2.0
2,4-Dichlorophenol	31	120-83-2	625	0.5	1.0
2,4-Dimethylphenol	34	105-67-9	625	0.5	1.0
4,6-dinitro-o-cresol (2-methyl-4,6,-dinitrophenol)	60	534-52-1	625/1625B	1.0	2.0
2,4 dinitrophenol	59	51-28-5	625	1.0	2.0
2-Nitrophenol	57	88-75-5	625	0.5	1.0
4-Nitrophenol	58	100-02-7	625	0.5	1.0
Parachlorometa cresol (4-chloro-3-methylphenol)	22	59-50-7	625	1.0	2.0
Pentachlorophenol	64	87-86-5	625	0.5	1.0
Phenol	65	108-95-2	625	2.0	4.0
2,4,6-Trichlorophenol	21	88-06-2	625	2.0	4.0

PRIORITY POLLUTANTS	**PP #**	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL) [2]** ***µg/L unless specified***
VOLATILE COMPOUNDS					
Acrolein	2	107-02-8	624	5	10
Acrylonitrile	3	107-13-1	624	1.0	2.0

PRIORITY POLLUTANTS	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL)[1] *µg/L unless specified*	Quantitation Level (QL)[2] *µg/L unless specified*
VOLATILE COMPOUNDS					
Benzene	4	71-43-2	624	1.0	2.0
Bromoform	47	75-25-2	624	1.0	2.0
Carbon tetrachloride	6	56-23-5	624/601 or SM6230B	1.0	2.0
Chlorobenzene	7	108-90-7	624	1.0	2.0
Chloroethane	16	75-00-3	624/601	1.0	2.0
2-Chloroethylvinyl Ether	19	110-75-8	624	1.0	2.0
Chloroform	23	67-66-3	624 or SM6210B	1.0	2.0
Dibromochloromethane (chlordibromomethane)	51	124-48-1	624	1.0	2.0
1,2-Dichlorobenzene	25	95-50-1	624	1.9	7.6
1,3-Dichlorobenzene	26	541-73-1	624	1.9	7.6
1,4-Dichlorobenzene	27	106-46-7	624	4.4	17.6
Dichlorobromomethane	48	75-27-4	624	1.0	2.0
1,1-Dichloroethane	13	75-34-3	624	1.0	2.0
1,2-Dichloroethane	10	107-06-2	624	1.0	2.0
1,1-Dichloroethylene	29	75-35-4	624	1.0	2.0
1,2-Dichloropropane	32	78-87-5	624	1.0	2.0
1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene) [6]	33	542-75-6	624	1.0	2.0

PRIORITY POLLUTANTS	**PP #**	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
VOLATILE COMPOUNDS					
Ethylbenzene	38	100-41-4	624	1.0	2.0
Methyl bromide (Bromomethane)	46	74-83-9	624/601	5.0	10.0
Methyl chloride (Chloromethane)	45	74-87-3	624	1.0	2.0
Methylene chloride	44	75-09-2	624	5.0	10.0
1,1,2,2-Tetrachloroethane	15	79-34-5	624	1.9	2.0
Tetrachloroethylene	85	127-18-4	624	1.0	2.0
Toluene	86	108-88-3	624	1.0	2.0
1,2-Trans-Dichloroethylene (Ethylene dichloride)	30	156-60-5	624	1.0	2.0
1,1,1-Trichloroethane	11	71-55-6	624	1.0	2.0
1,1,2-Trichloroethane	14	79-00-5	624	1.0	2.0
Trichloroethylene	87	79-01-6	624	1.0	2.0
Vinyl chloride	88	75-01-4	624/SM6200B	1.0	2.0

PRIORITY POLLUTANTS	**PP #**	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)					
Acenaphthene	1	83-32-9	625	0.2	0.4

PRIORITY POLLUTANTS	**PP #**	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)					
Acenaphthylene	77	208-96-8	625	0.3	0.6
Anthracene	78	120-12-7	625	0.3	0.6
Benzidine	5	92-87-5	625	12	24
Benzyl butyl phthalate	67	85-68-7	625	0.3	0.6
Benzo(*a*)anthracene	72	56-55-3	625	0.3	0.6
Benzo(b)fluoranthene (3,4-benzofluoranthene)[7]	74	205-99-2	610/625	0.8	1.6
Benzo(j)fluoranthene[7]		**205-82-3**	625	0.5	1.0
Benzo(k)fluoranthene (11,12-benzofluoranthene)[7]	75	207-08-9	610/625	0.8	1.6
Benzo(r,s,t)pentaphene		**189-55-9**	625	0.5	1.0
Benzo(*a*)pyrene	73	50-32-8	610/625	0.5	1.0
Benzo(*ghi*)Perylene	79	191-24-2	610/625	0.5	1.0
Bis(*2-chloroethoxy)*methane	43	111-91-1	625	5.3	21.2
Bis(*2-chloroethyl*)ether	18	111-44-4	611/625	0.3	1.0
Bis(*2-chloroisopropyl*)ether	42	39638-32-9	625	0.3	0.6
Bis(*2-ethylhexyl*)phthalate	66	117-81-7	625	0.1	0.5
4-Bromophenyl phenyl ether	41	101-55-3	625	0.2	0.4
2-Chloronaphthalene	20	91-58-7	625	0.3	0.6
4-Chlorophenyl phenyl ether	40	7005-72-3	625	0.3	0.5
Chrysene	76	218-01-9	610/625	0.3	0.6

PRIORITY POLLUTANTS	**PP #**	**CAS Number (if available)**	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)					
Dibenzo (a,h)acridine		**226-36-8**	610M/625M	2.5	10.0
Dibenzo (a,j)acridine		**224-42-0**	610M/625M	2.5	10.0
Dibenzo(a-*h*)anthracene (1,2,5,6-dibenzanthracene)	82	53-70-3	625	0.8	1.6
Dibenzo(a,e)pyrene		192-65-4	610M/625M	2.5	10.0
Dibenzo(a,h)pyrene		189-64-0	625M	2.5	10.0
3,3-Dichlorobenzidine	28	91-94-1	605/625	0.5	1.0
Diethyl phthalate	70	84-66-2	625	1.9	7.6
Dimethyl phthalate	71	131-11-3	625	1.6	6.4
Di-n-butyl phthalate	68	84-74-2	625	0.5	1.0
2,4-dinitrotoluene	35	121-14-2	609/625	0.2	0.4
2,6-dinitrotoluene	36	606-20-2	609/625	0.2	0.4
Di-n-octyl phthalate	69	117-84-0	625	0.3	0.6
1,2-Diphenylhydrazine (*as Azobenzene*)	37	122-66-7	1625B	5.0	20
Fluoranthene	39	206-44-0	625	0.3	0.6
Fluorene	80	86-73-7	625	0.3	0.6
Hexachlorobenzene	9	118-74-1	612/625	0.3	0.6
Hexachlorobutadiene	52	87-68-3	625	0.5	1.0
Hexachlorocyclopentadiene	53	77-47-4	1625B/625	0.5	1.0
Hexachloroethane	12	67-72-1	625	0.5	1.0

PRIORITY POLLUTANTS	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL)[1] *µg/L unless specified*	Quantitation Level (QL)[2] *µg/L unless specified*
BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)					
Indeno(*1,2,3-cd*)Pyrene	83	193-39-5	610/625	0.5	1.0
Isophorone	54	78-59-1	625	0.5	1.0
3-Methyl cholanthrene		**56-49-5**	625	2.0	8.0
Naphthalene	55	91-20-3	625	0.3	0.6
Nitrobenzene	56	98-95-3	625	0.5	1.0
N-Nitrosodimethylamine	61	62-75-9	607/625	2.0	4.0
N-Nitrosodi-n-propylamine	63	621-64-7	607/625	0.5	1.0
N-Nitrosodiphenylamine	62	86-30-6	625	0.5	1.0
Perylene		**198-55-0**	625	1.9	7.6
Phenanthrene	81	85-01-8	625	0.3	0.6
Pyrene	84	129-00-0	625	0.3	0.6
1,2,4-Trichlorobenzene	8	120-82-1	625	0.3	0.6

PRIORITY POLLUTANT	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL)[1] *µg/L unless specified*	Quantitation Level (QL)[2] *µg/L unless specified*
DIOXIN					
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (2,3,7,8 TCDD)	129	1746-01-6	1613B	1.3 pg/L	5 pg/L

PRIORITY POLLUTANTS	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL)[1] *µg/L unless specified*	Quantitation Level (QL)[2] *µg/L unless specified*
PESTICIDES/PCBs					
Aldrin	89	309-00-2	608	0.025	0.05
alpha-BHC	102	319-84-6	608	0.025	0.05
beta-BHC	103	319-85-7	608	0.025	0.05
gamma-BHC (Lindane)	104	58-89-9	608	0.025	0.05
delta-BHC	105	319-86-8	608	0.025	0.05
Chlordane [8]	91	57-74-9	608	0.025	0.05
4,4'-DDT	92	50-29-3	608	0.025	0.05
4,4'-DDE	93	72-55-9	608	0.025	0.05
4,4' DDD	94	72-54-8	608	0.025	0.05
Dieldrin	90	60-57-1	608	0.025	0.05
alpha-Endosulfan	95	959-98-8	608	0.025	0.05
beta-Endosulfan	96	33213-65-9	608	0.025	0.05
Endosulfan Sulfate	97	1031-07-8	608	0.025	0.05
Endrin	98	72-20-8	608	0.025	0.05
Endrin Aldehyde	99	7421-93-4	608	0.025	0.05
Heptachlor	100	76-44-8	608	0.025	0.05
Heptachlor Epoxide	101	1024-57-3	608	0.025	0.05
PCB-1242 [9]	106	53469-21-9	608	0.25	0.5
PCB-1254	107	11097-69-1	608	0.25	0.5

PRIORITY POLLUTANTS	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL)[1] *µg/L unless specified*	Quantitation Level (QL)[2] *µg/L unless specified*
PESTICIDES/PCBs					
PCB-1221	108	11104-28-2	608	0.25	0.5
PCB-1232	109	11141-16-5	608	0.25	0.5
PCB-1248	110	12672-29-6	608	0.25	0.5
PCB-1260	111	11096-82-5	608	0.13	0.5
PCB-1016 [9]	112	12674-11-2	608	0.13	0.5
Toxaphene	113	8001-35-2	608	0.24	0.5

1. Detection level (DL) or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR part 136, Appendix B.

2. Quantitation Level (QL) also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer. (64 FR 30417).

   ALSO GIVEN AS: The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency December 2007).

3. Soluble Biochemical Oxygen Demand method note: First, filter the sample through a Millipore Nylon filter (or equivalent) - pore size of 0.45-0.50 um (prep all filters by filtering 250 ml of laboratory grade deionized water through the filter and discard). Then, analyze sample as per method 5210-B.

4. NWTPH Dx - Northwest Total Petroleum Hydrocarbons Diesel Extended Range – see http://www.ecy.wa.gov/biblio/97602.html

5. NWTPH Gx - Northwest Total Petroleum Hydrocarbons Gasoline Extended Range – see http://www.ecy.wa.gov/biblio/97602.html

6. 1, 3-dichloroproylene (mixed isomers) You may report this parameter as two separate parameters: cis-1, 3-dichlorpropropene (10061-01-5) and trans-1, 3-dichloropropene (10061-02-6).

7. Total Benzofluoranthenes - Because Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene co-elute you may report these three isomers as total benzofluoranthenes.

8. Chlordane – You may report alpha-chlordane (5103-71-9) and gamma-chlordane (5103-74-2) in place of chlordane (57-74-9). If you report alpha and gamma-chlordane, the DL/PQLs that apply are 0.025/0.050.

9. PCB 1016 & PCB 1242 – You may report these two PCB compounds as one parameter called PCB 1016/1242.